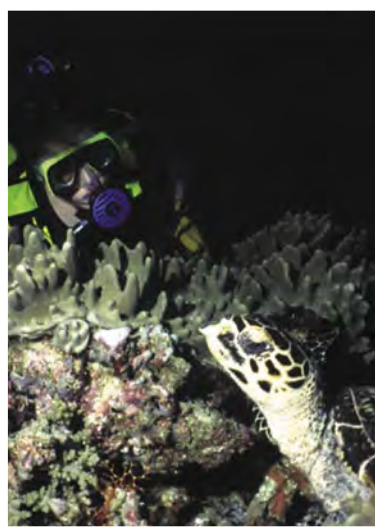




An Assessment of the Status and Exploitation of Marine Turtles in the UK Overseas Territories in the Wider Caribbean





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

An Assessment of the Status and Exploitation of Marine Turtles in the UK Overseas Territories in the Wider Caribbean

CONTENTS

	Page
1. Executive Summary	1-4
2. General Introduction and Methods	5-15
3. Overview of Legislation Pertinent to Marine Turtle Harvest	16-38
4. Status and Exploitation of Marine Turtles in Anguilla	39-77
5. Status and Exploitation of Marine Turtles in Bermuda	78-95
6. Status and Exploitation of Marine Turtles in the British Virgin Islands	96-123
7. Status and Exploitation of Marine Turtles in the Cayman Islands	124-154
8. Status and Exploitation of Marine Turtles in Montserrat	155-179
9. Status and Exploitation of Marine Turtles in the Turks and Caicos Islands	180-222
10. Towards a Molecular Profile of Turtles in the UKOT's in the Caribbean	223-236
11. Capacity Building and Support: Essential Components of TCOT	237-247
12. TCOT Publicity: Getting the Message Across	248-253

Appendices

(only available online at <<http://www.seaturtle.org/mtrg/projects/TCOT/finalreport/>>)

Section 2:

- 2.1. TCOT Socioeconomic Questionnaire
- 2.2. Caribbean TurtleWatch Poster
- 2.3. Caribbean TurtleWatch Advice Note
- 2.4. Caribbean TurtleWatch Data Sheet

Section 3.

3.1. Pertinent Legislation - Anguilla

- 3.1.1. Fisheries Protection Act
- 3.1.2. Fisheries Protection (Amendment) Regulations
- 3.1.3. Marine Parks Act
- 3.1.4. Marine Parks Regulations
- 3.1.5. Beach Protection Act
- 3.1.6. Beach Protection Order

3.2. Pertinent Legislation - Bermuda

- 3.2.1. Fisheries Act 1972
- 3.2.2. Fisheries (Protected Species) Order 1978
- 3.3.3. Fisheries (Protected Areas) Order 2000
- 3.4.4. Protected Species Act 2003

3.3. Pertinent Legislation - British Virgin Islands

- 3.3.1. Turtles Ordinance 1959 (1986 revision)
- 3.3.2. Turtles Ordinance 1959 (1987 revision)

3.4. Pertinent Legislation - Cayman Islands

- 3.4.1. Marine Conservation Law 1978
- 3.4.2. Marine Conservation (Turtle Protection) Regulations 1996
- 3.4.3. Marine Conservation (Marine Parks) Regulations 1996
- 3.4.4. The Restricted Marine Areas (Designation) Regulations 1998
- 3.4.5. Endangered Species Protection and Propagation Law 1978 (1999 revision)
- 3.4.6. Rules for Cayman Islands Marine Parks
- 3.4.7. The Endangered Species Law 2004

3.5. Pertinent Legislation - Montserrat

3.5.1. Turtle Ordinance 1951

3.5.2. Turtle Act 2002

3.6. Pertinent Legislation - Turks and Caicos Islands

3.6.1. Fisheries Protection Ordinance 1941 and Regulations
(including subsidiary legislation and amendments)

3.6.2. National Parks Ordinance (including subsidiary legislation
and amendments)

Section 4. Anguilla

4.1. Leaflet: *Help Us Grow Stop the Glow*

Section 5. Bermuda

5.1. Leaflet: *Protected Areas*

5.2. *Turtle Alert Leaflet*

Section 6. British Virgin Islands

6.1. CFD Fishing Laws Leaflet

6.2. Website: *Nature's Little Secrets*

Section 7. Cayman Islands

7.1. CIDoE Leaflet

Section 10. Towards a Molecular Profile

10.1. Genetics Sampling Sheet

Section 11. Capacity Building

11.1. Workshop Report

11.2. Advice Note-Foraging

11.3. Advice Note Nesting

11.4. TCOT Tourism Leaflet

11.5. TCOT Bibliography

Section 12. Publicity

12.1. Leaflet for CITES CoP

12.2. Press Release 1

12.3. Press Release 2

12.4. Press Release 3

12.5. TCOT Postcard

General Acknowledgements

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Executive Summary

We report on the results of a 3-year UK Government (Defra and FCO) funded project involving diverse collaborative research initiatives, capacity building and awareness raising efforts regarding the Status and Exploitation of Marine Turtles in the UK Caribbean Overseas Territories (TCOT). This included Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands. In each OT, each species present can occur in both nesting population and foraging aggregations. For management purposes, these nesting and foraging populations need to be considered as different entities.

Nesting

Nesting populations in Bermuda have been considered extirpated for over 50 years. The nesting populations of four species in the other regional UK OTs are either critically reduced or extirpated. Given the fact that turtles return to the region of their birth to breed, these populations hold significant biodiversity value as they may constitute unique demographic units. There are green turtle nesting populations (Anguilla, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos Islands); hawksbill nesting populations (Anguilla, British Virgin Islands, Montserrat, Turks and Caicos Islands with possible remnant nesting in Cayman Islands), leatherback nesting populations (Anguilla, British Virgin Islands with occasional nesting activities in Cayman Islands and Montserrat); loggerhead nesting populations (Cayman Islands with occasional nesting in Montserrat and unconfirmed nesting in Turks and Caicos Islands).

Rookery monitoring including genetics analysis is underway in all OTs. Although a few sites in Anguilla and Turks and Caicos Islands are yet to be subject to detailed scrutiny, it is possible that in each OT, the total combined nesting populations of all species numbers fewer than 50 females per year.

Foraging

Despite having been subject to direct harvest for centuries, all 6 OTs in the Wider Caribbean host aggregations of foraging marine turtles. Although other species may be found occasionally, two species are widespread and can be found in regionally important local pockets of abundance, typically in the less developed parts of near-shore environments. These are the green turtle (Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands with unknown densities being present in Montserrat) and the hawksbill turtle (Anguilla, British Virgin Islands, Cayman Islands, Turks and Caicos Islands with small populations found in Bermuda and unknown densities being present in Montserrat). In Bermuda, in-water work was well developed but in the other five OTs, detailed work to allow patterns of distribution and abundance and genetic profiles was launched as part of the TCOT project. Turtles are likely to be the progeny of breeding colonies across the Caribbean and possibly across the whole Atlantic, highlighting the need for a regional approach to management of these species.

Direct Exploitation

Turtles are afforded a very high degree of protection in Bermuda, are subject to a moratorium in Anguilla and subject to a legal catch in each of the other 4 OTs in this study. Egg take and harvest of adult nesting females are no longer prevalent with most take focussing on turtles at sea. Preliminary data using site-specific methodological approaches gathered as part of TCOT highlights that the take is variable across the OTs;

British Virgin Islands: >150 green turtles and >50 hawksbill turtles per annum;

Cayman Islands: >20 turtles per annum constituting green, hawksbill, and loggerhead turtles;

Montserrat: 10-30 turtles per annum - constituting green and hawksbill turtles;

Turks and Caicos Islands: up to 1130 green turtles and 900 hawksbills per annum.

Adjustments to size classes targeted, seasonality, current legislation and levels of enforcement would increase the likelihood that any continuing harvests take place at a sustainable level.

Sea turtles are considered economically and/or culturally valuable in all OTs. Sea turtle consumption is prevalent and culturally important in all of the OTs other than Bermuda. Its economic importance varies between OTs (depending on levels of harvest, trade, and numbers of fishers involved), but most turtle fishers and vendors of turtle products rate this importance as moderate or low. Turtle harvesting is arguably most important in Turks and Caicos Islands, where it fulfils both a subsistence and commercial need for a large number of fishers; prior to the moratorium on turtle fishing in Anguilla, turtle fishing was likely of comparable importance.

Indirect Exploitation

Tourism is an important activity in the economies of all of the OTs, although the absolute size of the industry varies greatly between OTs. Turtles are featured in some marine activities (i.e. snorkelling and diving), and are used in advertising (especially in the Cayman Islands). Surveys of both divers and business owners suggest that the economic importance of turtles to these businesses is currently low. While divers appreciate seeing turtles in the water, most do not seek out dive operators based on the possibility of seeing turtles. While businesses appreciate the attraction of turtles to customers, most believe that use of their services would not change if turtles disappeared from OT waters. In the rich marine environment of the Caribbean, turtles are one of many natural features that tourists appreciate. Given the low density of nesting of most species in most of the OTs, organized turtle walks are unlikely to become an important economic activity. Nevertheless, there are

ways that tourists and the tourist industry can participate in turtle conservation, and we make related recommendations with the aim of increasing the value of turtles to the tourism industry and increasing the tourism industry's investment in turtle conservation.

Recommendations

We make detailed, OT specific recommendations, to OT governments:

- 1. To increase capacity for marine turtle management.**
- 2. Amend legislation and policy to facilitate marine turtle population recovery.**
- 3. Continue and enhance systematic monitoring of marine turtle populations.**
- 4. Establish further conservation and awareness programmes to sensitise residents and visitors to marine turtle conservation requirements.**

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters through the provision of funding and expertise under FCO/DfID's Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships to OT citizens to undertake tertiary education in biodiversity/conservation related subjects.





General Introduction and Methods





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2. General Introduction and Methods

Contents

	Page
2.1. Summary	6
2.2. Background to TCOT	6-8
2.3. Methods Used in TCOT	8-15
2.3.1. The Questionnaire Based Approach: A description and assessment of the socio-economic survey.	8-14
2.3.2. Use of the Caribbean Turtlewatch Package	14-15
2.4. Acknowledgements	16
2.5. References	16

2.1. Summary

This short chapter summarises the background, structure and ethos of the TCOT project. In addition, two unique data collection packages are outlined: 1) The TCOT socioeconomic survey and; 2) Caribbean Turtlewatch. We describe how these were carried out and give preliminary discussion to the caveats that must be considered in interpreting data gathered using these mechanisms.

2.2. Background to TCOT

It is widely acknowledged that some of the UK Overseas Territories (OTs) support significant populations of foraging and nesting marine turtles (e.g. Aitken *et al.* 2001; Eckert *et al.* 1992; Godley *et al.* 2001a). However the legal status of turtles in the OTs varies from Territory to Territory, and there are little or no current quantitative data on the extent of exploitation or current status of marine turtles (Fleming 2001; Proctor & Fleming 1999). As a result, it has not yet been possible to assess the impact of current harvests on turtle populations. Turtles are highly migratory and the impact of any harvests or bycatch in the OTs may detrimentally affect populations breeding elsewhere. The converse is also true.

Cuba's bids to resume international trade in hawksbill turtles at two successive CITES Conferences of the Parties (CoP 10 & 11) were rejected. This was primarily because some Parties and conservation organisations were concerned that Cuba's proposed harvest would impact regional breeding populations (Richardson 2000). At the Caribbean Hawksbill Range State Dialogue Meeting held by CITES in Mexico in May 2000 and attended by the UK and representatives from five OTs, it was agreed by the Parties that:

“ -Critical knowledge gaps should be identified and standardised monitoring protocols developed for key parameters to monitor population trends and status.

-Monitoring of harvest and trade (legal and illegal, domestic and international) and their impacts on hawksbill populations should be improved in the wider Caribbean region.

-Different existing hawksbill turtle management programmes and policies in the wider Caribbean should be reviewed to assess their conservation impacts and relative benefits for hawksbill turtle population recovery.

-An effective hawksbill turtle conservation strategy and management plan should be established at a regional level taking into account the full range of national conservation objectives and development needs in the wider Caribbean” (CITES communiqué 2001)."

This led to the following relevant decisions being adopted at CITES CoP 12:

Directed to Parties

12.44 States and territories in the wider Caribbean region should:

- a) develop further a collaborative regional conservation strategy, based on the outline of a strategic plan provided in Annex 4 <<http://www.cites.org/eng/decis/valid12/annex4.shtml>> to these Decisions, to enhance the conservation status of hawksbill turtles and, where appropriate, other marine turtles within the wider Caribbean;
- b) implement the strategy through the development and implementation of national management plans;
- c) adopt and implement standard protocols for the monitoring, at recommended and agreed index sites, of populations of nesting and foraging hawksbill turtles and that similar efforts should be made to monitor legal harvests, by-catch in other fisheries and illegal take;
- d) implement measures to reduce illegal catch and illegal trade in hawksbill turtles and parts and derivatives thereof, including measures to improve the control of stocks of hawksbill turtle parts and derivatives by identifying, marking, registering and securing all such stockpiles; and
- e) Report on progress with the implementation of the regional conservation strategy and national management plans at the 13th meeting of the Conference of the Parties.

Directed to Parties, intergovernmental organizations, international aid agencies and non-governmental organizations.

12.45 Governments and intergovernmental organizations, international aid agencies and non-governmental organizations are encouraged to provide funds to enable the implementation of the Caribbean regional hawksbill strategy and to support the regional dialogue process.

In order for the UK and the OTs to fulfil these recommendations, it is clearly important that following be assessed in the OTs:

1. the status of marine turtles;
2. the harvest/bycatch of marine turtles;
3. genetic stock of turtles;
4. current marine turtle research, conservation and management efforts.

These data will assist the UK, the OTs and other countries in the region to support, develop and manage co-ordinated regional conservation programmes for hawksbills and other marine turtle species, and allow relevant policy makers to make informed decisions regarding future trade in marine turtles or products derived from them.

In early 2001, the UK Department of Environment, Food and Rural Affairs (Defra) issued a call for bids for a project that would:

- a) Assemble data on the harvest and uses of marine turtle populations in OTs;
- b) Assess the current conservation status of, and trends in, marine turtle populations;
- c) Determine by DNA analysis the genetic profile of turtles in OTs and the origin of harvested animals;
- d) Provide an assessment of the sustainability of any harvest;
- e) Provide recommendations for the future conservation, monitoring and management of marine turtles in the OTs.

This report outlines the work of this project, which included Bermuda. Although not strictly in the Caribbean, Bermuda can be considered in the Wider Caribbean (See Figure 2.1 for map of TCOT geographic range). The successful consortium that executed "Turtles in the Caribbean Overseas Territories" (TCOT) consisted of the following:

Lead Partner

Marine Turtle Research Group (MTRG), initially at the University of Wales Swansea, moving to University of Exeter in Cornwall mid-contract.

Subcontractor

Marine Conservation Society (MCS)

In association with

Cayman Islands Department of Environment (CIDoE)
Cayman Turtle Farm (CTF)
University of Cardiff (UC)
Duke University, USA (DU)

This group were joined by a number of interested individuals and the following organisations in the OTs:

Anguilla

Department of Fisheries and Marine Resources (DFMR)
Anguilla National Trust (ANT)
Local Dive Operators

Bermuda

The Bermuda Turtle Project (BTP)
Bermuda Government Ministry of the Environment
Bermuda Government Department of Conservation Services
Bermuda Aquarium Museum and Zoo (BAMZ)

British Virgin Islands

Conservation and Fisheries Department (CFD)
BVI National Parks Trust (NPT)
H. Lavity Stout Community College
Island Resources Foundation
Local Dive Operators

Cayman Islands

Local Dive Operators
University College of the Cayman Islands

Montserrat

Montserrat Department of Agriculture
Montserrat Department of Fisheries
Montserrat National Trust
Montserrat Volcano Observatory
Local Dive Operators

Turks and Caicos Islands

Department of Environment and Coastal Resources (DECR)
Turks and Caicos Protected Areas Department (formerly: Coastal Resources Management Project)
Local Dive Operators

For the purposes of this report, the term 'TCOT staff' refers to researchers from MTRG (B.J. Godley, A.C. Broderick), MCS (S. Ranger, P. Richardson), and DU (L. Campbell). 'TCOT partners' refers to all other individuals participating in TCOT and representing the various organizations listed above. 'TCOT team' refers to both staff and partners.

The proposal outlined 5 inter-related yet divisible work packages that constitute the main body of the bid:

A Scoping study

B Harvests

C Status

D Genetics

E Recommendations

In negotiations with Defra representatives, it was decided that a previously included work package on "Training and Capacity Building", although laudable and a high priority for funding, could not be supported within the current Defra initiative. This work package and some additional smaller elements of other work packages were removed, and submitted as a separate bid to the FCO Environment Fund for the Overseas Territories. This was successful and contributed to essential capacity building by:

- 1) Supporting a dedicated workshop
- 2) Facilitating OT networking
- 3) Providing *ex-situ* support

Here we report on all the results of the TCOT project as funded by Defra/FCO. We integrate findings and recommendations into the following sections:

1. **Executive Summary**
2. **General Introduction and Methodology**
3. **Legal Overview**
- 4-9. **Status and Exploitation of Marine Turtles: Individual OT Reports**
10. **Towards a Molecular Profile of Turtles in the UKOTs in the Caribbean**
11. **Capacity Building**
12. **Information Dissemination**

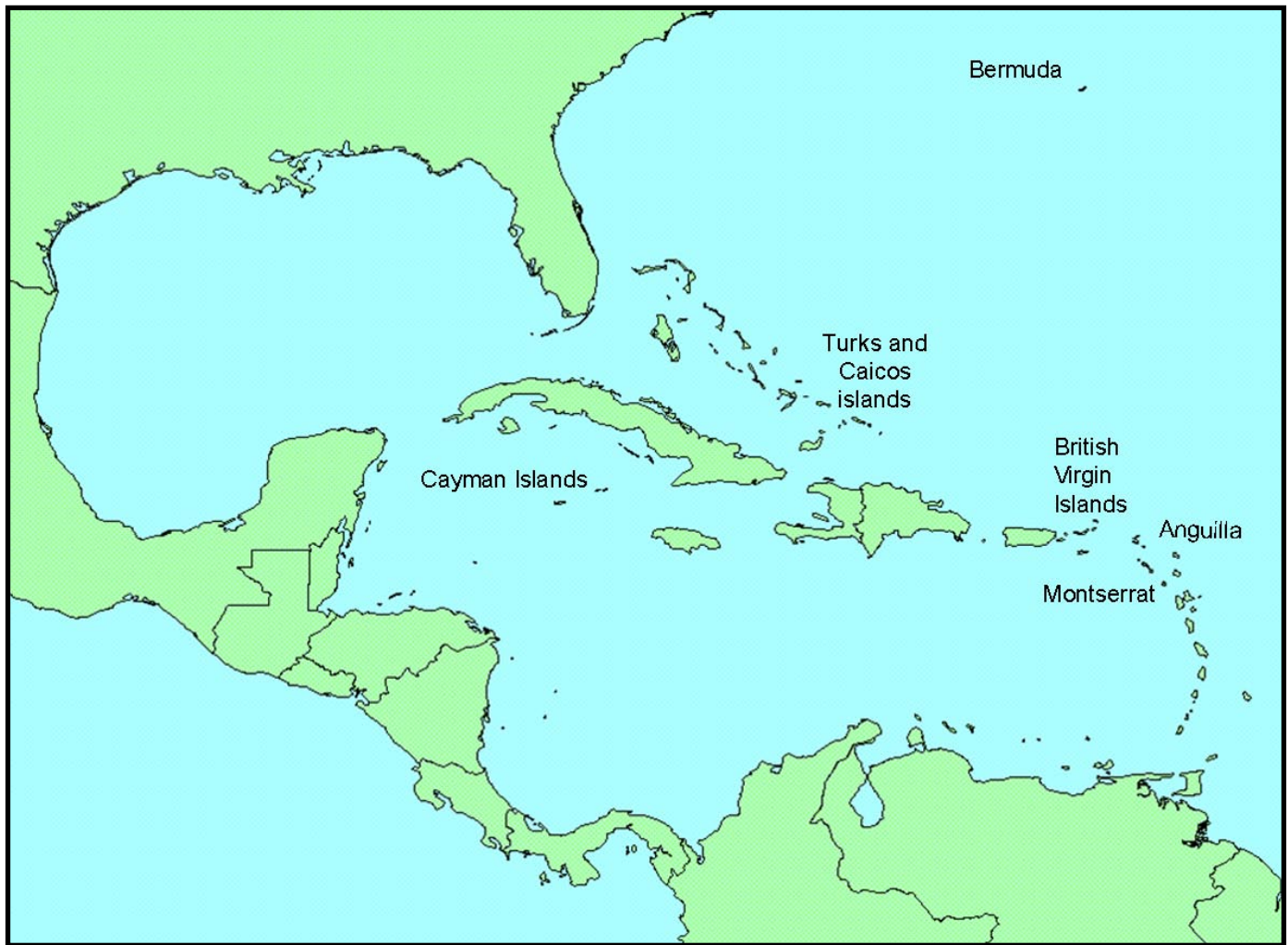


Figure 2.1. Geographic coverage of the TCOT project.

In addition, we facilitate the transmission of large bodies of ideas and information through extensive use of online appendices stored as PDF's at the project reporting website at: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>

2.3. Methods Used in TCOT

Each chapter of this report stands largely independently, and recommended marine turtle monitoring strategies varied according to site specific factors such as turtle abundance, time and financial resources, and other logistical considerations. Methods used to date as part of TCOT for collecting biological data are standard and described in volumes such as Eckert *et al.* (1999). However, two methods were custom designed for use in the TCOT project and are described here:

2.3.1. The Questionnaire Based Approach: A description and assessment of the socio-economic survey.

A socio-economic questionnaire (TCOT SEQ) was designed to assess the nature and value of marine turtle use (direct and indirect) to different user groups, including fishers (general), turtle fishers, direct vendors, indirect vendors, and consumers. The TCOT SEQ is available in downloadable PDF format as appendix 2.1 to this report. Researchers are welcome to use and/or adapt this survey for

their own purposes. However, our experiences conducting the questionnaire provided valuable insight into which questions worked best, and which were most problematic for respondents. We recommend that researchers contact Lisa Campbell <Lisa.m.Campbell@duke.edu> or Sue Ranger <sue@mcsuk.org> prior to use.

All respondents were asked to provide information on household demographics and livelihoods (sections 1 and 2), their opinions on trends in numbers of turtles nesting and seen in-water and on a variety of conservation options, and their awareness of laws regulating marine turtle use (section 9).

The stakeholder specific sections were designed to elicit information related to the various ways in which turtles are used, both in the past and in the present. General fishers were interviewed to assess fishing activities overall and the importance of marine turtles in these (if relevant), and the levels of marine turtle by-catch experienced when fishing for other things (section 3). Turtle fishers were questioned regarding importance of turtle fishing, fishing effort and seasonality, preferences for and knowledge of specific species, commercial sale of marine turtles and their parts, and their opinions on a variety of options for

sea turtle management (section 4). An important aspect of this assessment was how marine turtle fishing had changed over time. Section 5 targeted egg collectors, and questioned them regarding frequency and seasonality of collecting, species knowledge and preferences, and the commercial sale of turtle eggs. Vendors of marine turtle products were questioned in section 6. Information on the importance of marine turtles to overall vending activities, changes in the availability of products for sale over time, and market dynamics were sought. We also targeted non-consumptive 'users' of marine turtles, either through advertising, as an attraction, or through professional activities (section 7). Non-consumptive users were questioned regarding the importance of turtles to such activities, and customer responses to marine turtles. Consumers of marine turtle products were questioned in section 8, and were asked about frequency and purpose of use, seasonality of consumption, species preferences, market dynamics, and changes in availability of products for consumption over time.

In-country partners were trained on the principles of questionnaire administration in general (e.g. ethics, neutrality, etc.) and on the TCOT questionnaire specifically at the Cayman workshop (Photo 2.1). Additional training to partners in TCI, BVI and Anguilla was carried out when TCOT staff were in the field (Photo 2.2). The questionnaire was pilot tested by partners, both for clarity and for training purposes, at the Cayman workshop.

The questionnaire was developed collaboratively. An initial draft was developed by TCOT staff, in accordance with principles of questionnaire design (e.g. Kitchen & Tate 1999; Lindsay 1997) and based on the objectives of the research. It was then presented to TCOT partners participating at the Cayman Islands workshop in August 2002. That draft underwent considerable revision (Photo 2.3) as a result of partner input at the workshop, and a second version was ready some months later. This was circulated for comment to all partners, and finalized.

While consultations on the questionnaire delayed administration, TCOT staff felt it necessary for two key

reasons:

1) to increase partner buy-in and ownership of the questionnaire, and familiarity with the research tool in general. These were important concerns due to the proposed role of partners in administering the questionnaire and their general lack of experience with this research technique;

2) to account for the subtle differences between OTs and include specific issues of interest to particular OTs where possible. To a certain extent, this approach may have increased overall length. For example, at the request of some partners, a section evaluating use of turtles in a professional capacity (i.e. through research or advocacy efforts) was added. Although the questionnaire was already long, TCOT staff felt it was important to respond to partner requests.

Sampling

The sample of respondents answering the questionnaire was stratified into the target interest groups (e.g. fishers, consumers, etc., see Table 2.1). Within stratifications, sampling was both purposive (i.e. deliberate) and opportunistic, for a variety of reasons. For example, if the TCOT team identified 7 dive operators in a particular OT, all were approached to complete a survey (purposive sampling), as potentially important non-consumptive users of marine turtles. In contrast, more selective sampling was employed for larger stakeholder groups. For example, the number of fishers operating in South Caicos, TCI, was estimated at 200. While randomly sampling from this population was theoretically possible, it was practically infeasible, due to lack of formal lists of fishers and unpredictable availability. Fishers were opportunistically sampled, normally at fish landing sites, and possible known turtle fishers were purposively sampled to ensure their activities and views were included in the data.

While this approach limits the extent to which results can be considered representative of the larger population, it provided the flexibility to target specific people (i.e. known turtle fishers), to capitalize on opportunities in the field, and to ensure adequate coverage of each interest group.



Photo 2.1. Lisa Campbell outlining TCOT SEQ as part of training workshop (Photo S. Ranger).



Photo 2.2. Training of TCOT partners in the field.

Country	Fishers	Turtle Fishers	Turtle Egg Collectors	Turtle Vendors (Direct)	Turtle Vendors (Indirect)	Turtle Consumers	Refusals	Q'naires completed
Anguilla	36	28	20	27	27	63	2	72
Bermuda	26	5	2	0	1	23	0	71
BVI	30	20	9	28	23	41	3	56
Cayman	12	5	3	18	22	78	17*	107
Montserrat	30	17	7	26	8	50	11	71
TCI	59	50	27	21	20	85	6	92
TOTAL	193	125	68	120	101	340	39	469

Table 2.1. A summary of the number of questionnaires completed from each of the OT's in this study, with the number of completed sections of the questionnaire. *represents minimum number of refusals.



Photo 2.3. Revising TCOT SEQ.



Photo 2.4. Carapace on midden recovered as a result of SEQ.

Coverage

The socio-economic survey has been completed in all 6 of the OTs within the geographic range of TCOT. Details of stakeholder group coverage in each OT are summarized in Table 2.1. Because the questionnaire asked about current and past activities, numbers shown in Table 2.1. do not reflect current levels of activity. For example, the vast majority of egg collectors hadn't collected eggs for several decades. Turtle vendors (direct) included vendors who *could have* sold turtle products, but who chose not to. Details on past versus present use are reported in the exploitation sections for individual countries (section 4-9).

A total of 469 questionnaires were completed and returned to TCOT staff. With each taking between 30-120 minutes to complete, this is a huge achievement. In addition, a great deal of time was taken to source individuals within the community to target for interviews; turtle fishers in particular. The relatively small number of refusals (39, or 8%) indicates the willingness of the individuals to participate in this information sharing process. Reasons for refusals included suspicion of the process, lack of interest in the topic, or lack of time to commit to the interview. Additional benefits of the TCOT SEQ process were the localisation of additional samples and data as an extension of the interview (Photo 2.4) and the formation of relationships that have resulted in subsequent reporting, e.g. of turtle capture statistics as has occurred in Anegada, BVI (see section 6).

The benefits of conducting these interviews go beyond the actual data collected; interviews provided members of the community with the opportunity to state their opinions on subjects such as marine turtle fishing. Previous research has suggested that if these opinions are taken into account in decision-making by authorities, interview participants are likely to feel a greater sense of ownership of and stake in resulting policies (Holland *et al.* 1998; Jentoff 2000). In addition, the presence of the team conducting interviews will undoubtedly have led to increased discussions of this subject within the community and a rise in public awareness.

Survey administration

The original intention was that local partners would take the lead administering questionnaires, with TCOT staff providing support only. In most cases, this did not occur, for a variety of reasons. The challenges to survey administration and the



Photo 2.5. P. Richardson conducting a SEQ Interview (Photo S. Ranger).

way these were met were different in each OT, and have variable repercussions for understanding and interpreting results. Thus, they are described separately in the Table 2.2 below.

All surveys were administered in person, by 1 or 2 people (Photo 2.5 and 2.6). In all cases, administrators asked the questions and, when present, an assistant recorded responses. This was necessary due to the complex nature of the questionnaire, which prohibited written completion by respondents. If no assistant was available, the administrator recorded responses. The majority of questions were structured to facilitate comparison. For example, opinions were gauged using an adapted Likert-like scale (see Kitchen and Tate 1999). In many cases, however, respondents were asked to elaborate on their answers. Furthermore, administrators noted any additional, relevant information provided in margins and in end of section notes. While difficult to analyse, this type of qualitative data may provide a context for better understanding quantitative responses.

Local partner responses to the survey

As Table 2.2. shows, the participation of TCOT staff (Ranger, Richardson and Campbell) or other contracted researchers (McGowan, Martin and Silver) was required to complete survey administration in all OTs except CI and Bermuda. Several factors were at work in this: 1) small staff numbers in partner agencies, all of whom took on TCOT in addition to, rather than instead of, their regular duties, with no additional resources; 2) lack of familiarity with social surveys in general, which detracted from individual confidence in ability to conduct the survey; 3) the complexity of the questionnaire, and the impression that it was lengthy (true in the case of fishers, but not so in the case of other stakeholders); 4) a lack of interest in participating in questionnaire administration. While it is easy to cite lack of resources as the main reason capacity building in this area was not as successful as anticipated, honest reflection on this has to include a simple lack of interest among partners as a possible factor. In some cases, TCOT staff were greeted with initial enthusiasm,

only to see it wane, sometimes in a matter of hours. Thus, while initial consultations with partners at the Cayman Islands Workshop and the substantial revisions made to the questionnaire afterwards were designed to increase partner 'ownership', this did not generally occur.

Potential for bias among respondents

All surveys need to consider the potential for bias among survey respondents. Possible sources of bias, and efforts taken to overcome these, are listed in Table 2.3. For brevity, the discussion in this report is limited to bias that may have affected turtle fishers. Fishers were asked to provide the most quantitative data (on abundance, fishing effort, etc.), and were the group most likely to perceive the TCOT survey as possibly threatening to their livelihoods. Thus, potential bias in responses was most likely to arise among this group, and to be most problematic for interpreting results.

While a statement of potential sources of bias is necessary, it is worth remembering the very low refusal rate experienced in all OTs, suggesting most fishers (and other stakeholders) were willing to engage in the TCOT process. Furthermore, J. Silver's work in TCI exposed positive responses to participation, in addition to the sources of apprehension discussed in Table 2.3. For example, many fishers were happy to participate and saw benefits to doing so. Benefits included the opportunity for input on the specific issue, and more general communication with the government. Fishers participated in an effort to be helpful, and due to both their



Photo 2.6. Interviewing in the BVI.

Country	Adminstrator(s)	Data entry	Analysis	Benefits	Limitations
Anguilla	Ranger; Richardson;	Ranger	Ranger	Consistency across admin, data entry and analysis; High familiarity with survey by surveyors; Long term presence by Ranger allowed for additional study on the impacts of the moratorium	Additional and unanticipated costs to TCOT; Local capacity building goals not met
Bermuda	J. Constable (Bermuda Aquarium Volunteer)	Constable	Campbell	Consistency across admin, and data entry; No cost to TCOT; Local capacity building	Constable was not formally trained to administer the questionnaire. However, there are very few inconsistencies in the data, so this limitation is negligible
British Virgin Islands	Campbell; Richardson; S. Gore, A. Pickering (BVI CFD); A. McGowan (MTRG Darwin Fellow)	J. Silver & Z. Meletis (Campbell graduate students)	Campbell	High familiarity with survey by some surveyors; High coverage of indirect vendors by S. Gore	Some inconsistencies in data recording; Fewer questionnaires completed in BVI; Additional and unanticipated costs to TCOT; Limited local capacity building
Cayman Islands	J. Solomon, C. Bell, Staff of CI DoE (ca.15%); Students in local college course (ca.85%)	J. Abbott (Campbell graduate student)	Campbell	Cayman partners found a locally appropriate solution that ensured data were collected, and the questionnaire was conducted in accordance with accepted ethical standards for working with human subjects*; Local capacity building (though with unintended group)	Many different administrators, with minimal training, and resulting high errors in data collection and recording; Administrators could not be contacted for follow-up questions by data analysts; Minimal coverage off Grand Cayman; High number of students interviewed (by friends and family)
Montserrat	C. Martin (MTRG post-doctoral researcher)	Martin	Campbell	Consistency in admin and data entry; Due to the small staff of the Department of Fisheries, hiring outside labour allowed the survey to be completed	Additional and unanticipated costs to TCOT; Local capacity building goals not met
TCI	A. Thomas, J. Parker & T.Fisher (DECR staff) <i>with</i> Silver (Campbell graduate student); Richardson. L.Slade (volunteer)	Silver; Richardson	Richardson	Consistency across admin, data entry and analysis; Long term presence by Silver allowed for additional study on fisher responses to participation in TCOT; DECR staff present for most surveys administered	Additional and unanticipated costs to TCOT; Additional costs incurred by Campbell; Limited local capacity building

Table 2.2. Benefits and limitations of survey administration strategies in each OT. *Following a discussion of the ethics of collecting data from fishermen at the 2000 TCOT workshop, Cayman Island partners decided they could not fulfil their ethical obligations to participants who might reveal illegal activity, due to their enforcement mandate and responsibilities.

Issue	TCOT Response
<i>Enforcement responsibilities of local partners</i>	
The enforcement role of many local partners was problematic. Even when individuals administering the survey did not have enforcement responsibilities (e.g. Thomas and Parker in TCI), the agency they worked for did. Thus, there was potential for fishers to modify responses, particularly those implicating themselves in any illegal activities.	The ethics statement preceding the survey was intended to assure participants that their participation was anonymous and that information provided by them would not be used against them. While fishers may have been suspicious of this, in many cases fishers did report illegal activities. Whether this was because they believed the statement re: ethics, or because enforcement is low in many areas (e.g. TCI, Bennett <i>et al.</i> 2001) is unknown.
<i>Perceived views of marine turtles</i>	
Faced with a group of researchers interested in marine turtles, many interviewees may have perceived the research team to have its own bias, and pitched their responses accordingly. For example, fishers may have understated/overstated catch levels (likewise, tourism operators may have overstated the importance of turtles to their businesses). J. Silver's MA research in TCI found fishers convinced of the 'turtle-hugging' nature of the TCOT research team.	All administrators were informed of the importance of remaining neutral while conducting interviews. While working with partners in the field, TCOT staff noticed an increased ability of individuals to do this over time. TCOT staff also made attempts to engage fishers in informal discussions of their work, and to express interest in the fishery rather than turtles.
<i>Memory</i>	
In many OTs, respondents were talking about activities undertaken years ago, e.g. trends in nesting numbers since they started fishing, or about egg collecting undertaken when they were children. Memory reliability is thus an issue for consideration.	The questionnaire double-checked some important information. For example, fishers commented on trends in numbers of turtles in general and by species, in two slightly different questions in separate sections of the questionnaire. Where memory was fuzzy, qualitative responses were accepted, and individuals were never forced to provide a numeric estimate. While this made data more difficult to analyse, it preserved the original intent of the respondents.
<i>Levels of interest</i>	
In many OTs, marine turtles are of minor importance overall, and fished primarily on an opportunistic basis. Thus, a lack of interest in turtles may have led some respondents to treat the survey lightly, answering questions without giving them full attention or consideration (J. Silver, unpublished MA data).	Beyond being patient and friendly in such scenarios, there is little a researcher can do to increase participant interest.
<i>Resentment of UK government</i>	
The relationship between the UK government and its Overseas Territories varies from OT to OT. In some cases, resentment and/or distrust of the UK may have influenced responses.	Working with local partners may have helped to dilute such resentment.
<i>Distrust of research in general</i>	
J. Silver found some resentment of researchers in general, based on past experiences where researchers didn't adequately respect local views or failed to return research results to the community.	Because of the potential policy implications of the research, respondents may have seen the utility of participating in spite of such distrust, and their desire to have their concerns heard may have overridden it.

Table 2.3. Potential for bias among turtle fishers.

beliefs in the importance of the issue and in the value of the knowledge they have.

The TCOT team is committed to finding the means to allow for effective and meaningful feedback and hope to begin this process as part of a new initiative funded under the Overseas Territories Environment Programme (OTEP). The nature of concerns raised by fishers about researchers and the research process suggests that much goodwill and improved relations could be secured through such a return of information.

2.3.2. Use of the Caribbean Turtlewatch Package

Data on the in-water abundance of marine turtles were gathered via a series of methods. One of these was *Caribbean Turtlewatch*, a questionnaire designed to be completed by recreational divers/snorkellers. Dive operators were approached by members of the TCOT team and asked to engage their customers in (and assist them with) completing the questionnaire. Specifically, divers/snorkellers were asked to: a) record presence or absence of turtles on all dives, and location of and conditions during sightings, b) estimate size and species of turtles sighted; c) evaluate the importance of possibly sighting turtles to their selection of dive sites/operators, and the contribution of positive sightings to the enjoyment of their dives. Operators were given forms, posters and information sheets to assist them with promoting and participating in this reporting programme (included in Appendix 2.2-2.4; Photo 2.7).

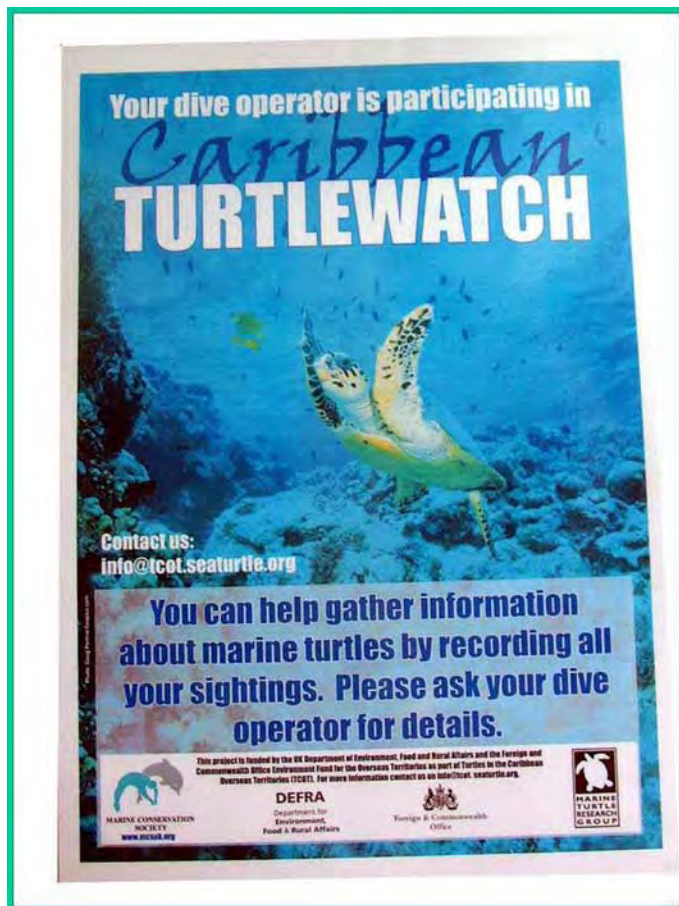


Photo 2.7. Caribbean Turtlewatch.

The purpose of this survey was to obtain data on the species and size composition, relative abundance and location of marine turtles in-water, and to undertake a preliminary assessment of the value of marine turtles to the dive industry. As with the socio-economic questionnaire, sources of potential error and bias are discussed here:

- There is a tendency for individuals to report more positive results than negative ones, thus data are probably over-representative of the numbers of dives resulting in observations of marine turtles. In some cases, e.g. Anguilla, we know definitively that only turtle sightings have been reported. However, with careful data filtering and close attention to ensure reporting of negative results, perhaps through ensuring dive masters record dives with no turtles, this methodology could have utility for setting baselines at key dive sites as locations for monitoring of relative abundance.
- Reef dwelling turtles, especially hawksbills, are more likely to be observed, and hawksbills were generally the most reported. Furthermore, there is high likelihood that the same turtles were seen on multiple occasions, as dive operators often frequent the same dive sites, particularly those that result in high customer satisfaction.
- Diving conditions are better in certain months, thus increasing both the number of dives and observations, and visibility in water. Furthermore, dive operations may scale-up operations during the tourist season. Thus data regarding the temporal spread of sightings should be treated with caution until a full analysis corrects for these factors.
- Although we cannot be certain that identification of the species of turtle observed is correct, the Caribbean Turtlewatch form allowed the recorder to state whether they were very sure, sure or not sure of the species. If they were unsure, we attributed the observation to species unknown.
- The estimate of the size of the individual turtle observed is likely to have high error. However, for the purpose of this survey, the information gathered at least allows us to roughly classify observed individuals as juvenile or as possible adult size.

Despite the many caveats associated with this system of monitoring, the method was useful for ascertaining species presence and giving some idea of relative abundance. In addition, it highlighted the areas where divers most commonly see turtles. It also raised awareness amongst the dive community and enabled their active involvement in monitoring and reporting.

Caribbean Turtlewatch was unsuccessful in Bermuda as, while dive operators were interested in participating in the programme, no turtles are recorded at these dive sites. In Anguilla, BVI and Montserrat, limited yet useful data were collected. In Anguilla there were three dive operators who initially expressed an interest in participating, but the TCOT project partners did not have the time to regularly liaise with them to maintain enthusiasm for the project. In BVI, project

partners were limited in their ability to spend time liaising with dive operators, and in Montserrat the one dive operator operated intermittently during the period of the TCOT study until the recent cessation of volcanic activity.

Caribbean Turtlewatch was most successful in the CI and TCI, primarily because there were TCOT partners in these territories who were able to commit the time and resources to the considerable dive operator liaison necessary to maintain the programme. Data in these OTs were collated, entered and analysed in a preliminary manner for this report by Catherine Bell (CIDoE) and Lorna Slade (TCI-based independent researcher). These data will undergo further analysis and be written up as manuscripts in the near future by these individuals and their collaborators.

2.4. Acknowledgements

Literally hundreds of people have come together to make the TCOT project such a great success. Many are mentioned in the individual chapters describing the area of work in which they were involved. Specifically for the work detailed in this chapter:

For the TCOT socioeconomic survey we thank the 469 interviewees who participated, gladly giving a great deal of time and information. Many thanks to all TCOT workshop attendees (see Appendix 11.1) for their inputs into the content and format of the questionnaire. In **Anguilla**: Thanks to the Department of Fisheries and Marine Resources for invaluable support in structuring the survey sample and to Carlos Sasso in particular for using his intimate knowledge of Anguilla's fishing community to track down interviewees; Karim Hodge for his time and support in administering the survey and arranging interviews. **Bermuda**: Jennifer Constable carried out all surveys and a portion of the data input with logistical support from Jennifer Gray. **BVI**: On Tortola, surveys were carried out by Shannon Gore and Arlington "Zeik" Pickering who also facilitated many interviews conducted by TCOT staff. On Anegada, Jim White and Damon Wheatley of the Darwin Anegada Project were instrumental in making introductions, with Andrew McGowan (MTRG) carrying out the interviews. **Cayman**: Professor Lilian Hayball, University College of the Cayman Islands and the students of her classes BIO 101 College Biology I, BIO 102 College Biology II and EVO 100 Introduction to Environmental Science. The Staff of the Cayman Islands Department of the Environment. The restaurant owners, fishers, and members of the public in Cayman who agreed to participate in the pilot interviews. **Montserrat**: Questionnaires were administered by Corinne Martin (MTRG) with support from the staff of the Montserrat Fisheries Department, Montserrat Governors Office, Montserrat Ministry of Agriculture, Montserrat National Trust, Montserrat Volcano Observatory, Royal Society for the Protection of Birds, Sea Wolf Diving School, and the following individuals: Crystal & Dean Archer, Mrs Hilda Blake, Helen & Gerard Cooper, Bo Dalsgaard, Mr & Mrs Darby, Alfred Edwards, Lexvern Fenton, Anne-Marie & David Graham, Linda Green, John Keller, Joe Philips, Sarah Sweeney, Mr & Mrs Walker.

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For Caribbean Turtle Watch: Anguilla: Thanks to Anguillian Divers. **BVI**: Co-ordination was initially carried out by Mervin Hastings and was then taken on by Shannon Gore (both BVI CFD). The dive operators involved included: Commercial Dive Services, Blue Water Divers, Dive BVI, Sail Caribbean, UBS, and White Squall. **Cayman**: Co-ordination was carried out by Catherine Bell (CIDoE) and the dive operators involved included: Wall to Wall, Cayman Submarines, Paradise Divers, Ocean Frontiers, Tortuga Divers, Seaview, Pirates Point and Southern Cross. **Montserrat**: Many thanks to Seawolf and Montserrat Divers. **TCI**: Very many thanks to Lorna Slade (independent researcher) who co-ordinated Caribbean Turtlewatch in TCI, and who was kindly supplied with completed datasheets by Flamingo Divers and Dive Provo of Providenciales, to whom we also extend our thanks.

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Overview of Legislation Pertinent to Marine Turtle Harvest





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

3. Overview of Legislation Pertinent to Marine Turtle Harvest

Contents

	Page
3.1. Harvest Legislation in the UK Overseas Territories in the Caribbean	17-25
3.1.1 Anguilla	20-21
3.1.2. Bermuda	22
3.1.3. British Virgin Islands	22
3.1.4. Cayman Islands	22
3.1.5. Montserrat	23
3.1.6. Turks and Caicos Islands	23-24
3.2. Multi-lateral Environmental Agreements (MEA's) and Turtle Harvest Legislation	25-29
3.2.1. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	25-27
3.2.2. Convention on Migratory Species (CMS or Bonn Convention)	27
3.2.3. Protocol Concerning Specially Protected Areas and Wildlife (SPA) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region	27-28
3.2.4. Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC)	29
3.3. TCOT Recommendations for Changes to National Legislation	29-37
3.3.1. Anguilla	29-32
3.3.2. Bermuda	32
3.3.3. British Virgin Islands	32-34
3.3.4. Cayman Islands	34
3.3.5. Montserrat	34-36
3.3.6. Turks and Caicos Islands	36-37
3.4. Acknowledgements	37
3.5. References	37-38

Reflecting the historical importance of turtle fisheries in the Wider Caribbean, all 6 Territories involved in the TCOT project have enacted legislation specifically designed to regulate marine turtle fisheries. Indeed, in 1620 the First Bermuda Assembly produced what is thought to be the world's first marine turtle protection legislation, by passing an Act that prohibited the harvest of young turtles (see section 5).

Currently, there is a diversity of legislation pertaining to the harvest and sale of marine turtles and their products in the UK Overseas Territories, ranging from complete prohibition in Bermuda, to regulated harvest of turtles and take of eggs in Montserrat. This section presents an overview of this legislation, highlights those multi-lateral environmental agreements (MEAs) that provide specific protection to marine turtles in the UK Overseas Territories in the Caribbean, and presents TCOT's recommended legislative changes. Where available, the full text of the pertinent legislation for each Territory is given in Appendices 3.1 to 3.6.

3.1. Harvest Legislation in the UK Overseas Territories in the Caribbean

The national legislation that regulates turtle harvest in each UK Overseas Territory in the Caribbean is, in most cases, based on legislation drafted several decades ago when scientific understanding of marine turtle ecology was less developed than it is today. While marine turtle population



Photo 3.1. Nest protection is an important component of depleted population conservation and recovery (Photo P. Richardson).

ecology is a relatively new field of study, Heppell *et al.* (2003) provide a comprehensive overview of the current status of understanding. The key points of the review by Heppell *et al.* are highlighted here.

Egg harvest: It is widely accepted that individual mortality at the hatchling and egg stage is common and is of minimal significance to the population when compared to mortality at other age classes. Female marine turtles have evolved to produce thousands of eggs during their reproductive lifetime to compensate for the inevitably high levels of egg and hatchling mortality to natural predators. However, survival at this life stage leads to recruitment into the population of the more valuable older age classes, and extensive harvest of eggs can prevent recruitment and lead to long-term nesting population collapse. As turtles are long-lived, the effects of sustained egg harvest at the nesting beach will only become evident within a nesting population several decades after the egg harvest has occurred. It is now fully accepted that when attempting to facilitate the recovery of small or depleted turtle populations, the protection of turtle nests from human harvest is an important component of an effective conservation strategy.

Harvest of juveniles, sub-adults and adults: Protecting nests alone will not facilitate the recovery of marine turtle populations if there is high mortality in later age classes. Maintenance of long-lived, slow-growing species like marine turtles depends heavily on high survival rates of juvenile, sub-adult and adult age classes within particular populations. Populations that suffer extensive and prolonged harvest of individuals within these age classes are liable to collapse. The UK Overseas Territories' traditional turtle fisheries typically targeted (and continue to target) foraging populations, nesting females and in some cases mating adults. Minimum size limits are a common feature of the Territories' harvest legislation, thereby permitting the take of the most reproductively valuable age classes. Prohibiting the take of older age classes is essential for effective marine turtle population management and therefore harvest legislation must include a maximum size limit.

The TCOT Socio-economic Questionnaire (TCOT SEQ) revealed that many turtle fishermen appreciate the need for a minimal size limit '*to protect the turtle nursery*', and often fishermen release very small turtles simply because of their limited value. Any change in turtle fishery legislation that limits a fisherman's activities and income is likely to be met with some opposition amongst the fishing community. Territory authorities often have limited enforcement capacity with regard to fishery management and therefore fishing community acceptance of legislation change is essential to avoid widespread illegal and covert turtle fishing. There is little biological justification for imposing a minimum size limit on a turtle fishery. However, in Territories where a harvest is desired and the fishermen appreciate this fishery conservation ethic, it may be justifiable to maintain the minimum size limit of the old legislation. This may give amended legislation introducing maximum size limits some familiarity, accessibility and thereby promote much



Photo 3.2. Most turtle fishermen interviewed during the TCOT SEQ accepted minimum size limits as a conservation measure (Photo P. Richardson).

needed acceptance and ownership amongst the fishing communities. Once appropriate awareness programmes have sensitised fishers to legislation amendments and have increased fisher understanding of turtle fishery management, the necessity of maintaining a minimum size limit can be reviewed.

Marine turtles are migratory, with females often travelling vast distances between foraging grounds and nesting beaches. Following their initial pelagic life stage, juvenile cheloniid turtles may settle on inshore foraging habitat located thousands of kilometres from their natal beach. Consequently, inshore foraging turtle populations, largely consisting of juvenile and sub-adult individuals, will represent nesting populations from throughout the region. Therefore, the foraging assemblage of any given species found in the waters of a particular Overseas Territory will be distinct from and largely unrelated to the population of adults of the same species that nest on the beaches of that same Territory. This is the case for green, hawksbill and loggerhead turtles. Leatherbacks are generally pelagic and do not regularly forage in inshore waters in the Caribbean. The two distinct aggregations, foraging and nesting, have completely different conservation management requirements, especially where harvest is permitted.

It is essential that this fundamental and critical concept is understood by all stakeholders involved in marine turtle population conservation and management in the UK Overseas Territories in the Caribbean.

Fisheries that extensively target mixed-stock foraging populations can have adverse impacts on the recruitment of the various contributing nesting populations within the region. Such fisheries could not only affect nesting populations elsewhere, but in turn may eventually impact the recruitment into the foraging population targeted. It is therefore prudent to ensure that any harvest is controlled, measured and limited, with, for example, measures such as closed seasons, geographical no take zones (e.g. Marine Protected Areas), quotas and permitting systems for marine turtle harvest. The TCOT SEQ assessed fisher acceptance of different management options. In most instances restrictions on fishing gear, seasons, and numbers of turtles captured were more acceptable than geographic no take zones, and efforts to implement the latter will need to work with fishers if these are to succeed.

Harvest of nesting females: Female green, hawksbill and loggerhead turtles exhibit high levels of fidelity to the nesting beaches they use, which are more than likely within close proximity to the beach that they themselves emerged from as hatchlings. Nesting females are perhaps the most valuable life stage of any turtle population, but are extremely susceptible to human predation given their predictable nesting behaviour and vulnerability on the nesting beach. Extensive and prolonged harvest of nesting females on the beaches of an Overseas Territory will rapidly deplete the nesting populations using those beaches. This has famously occurred in the Cayman Islands, once the location of one the largest green turtle rookeries in the Caribbean (Aiken *et al.* 2001), in Bermuda, and has probably occurred on Salt Cay, Grand Turk and Providenciales, Turks and Caicos Islands. The extensive harvest of nesting females almost led to the extinction of the leatherback population frequenting Tortola, BVI in the 1980s (Hastings 2003).



Photo 3.3. Harvest of nesting turtles should be completely prohibited in all the UK Overseas Territories in the Caribbean (Photo P. Richardson).

Legislation provisions	Anguilla	Bermuda	British Virgin Islands
Harvest legislation ^{3.1.1}	Fisheries Protection Act, Revised Statutes of Anguilla, Chapter F40, Fisheries Protection Regulations, Revised Regulations of Anguilla, Chapter F40-1 ^{3.1.2}	Fisheries Act 1972, Fisheries (Protected Species) Order 1978, Protected Species Act 2003	The Turtles Ordinance 1959 as amended 1986, Fisheries Act, 1997 ^{3.1.3}
Harvest, sale and possession of turtle eggs & nesting females	Prohibited until 15 th December 2005	No nesting turtle population but harvest of all marine turtles species is prohibited	Prohibited
Open season	NA	NA	NA
At sea capture, sale and possession	Prohibited until 15 th December 2005	Prohibited	Allowed with conditions
Open season	NA	NA	December through to March inclusive
Quota	NA	NA	No quotas
Size restrictions	NA	NA	Captured turtles must be 20lbs (9.07kg) in weight.
Species restrictions	NA	NA	No species restrictions, although legislation effectively protects leatherbacks as they are most likely encountered as nesting females.
Geographical restrictions	NA	NA	Fishing is prohibited within Marine Parks and Protected Areas
Method restrictions	NA	NA	Fishing using spear guns, SCUBA gear and explosives is prohibited
Penalties	<i>A fine of up to EC\$50,000 or up to one year imprisonment, or a fine of EC\$250,000 and imprisonment for 2 years for a second or subsequent offence or to both such fine and imprisonment.</i>	Fisheries Act: <i>Imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine, and any forfeiture of any fish so taken and any vessel, instrument and equipment used in such taking.</i> Protected Species Act: <i>Fine of \$5,000 or imprisonment for 6 months or, in the case of a second or subsequent offence, to a fine of \$10,000 or imprisonment for 6 months and, where the offence is a continuing offence, is liable on summary conviction to a fine of \$1,000 for each day on which the offence continues.</i>	Fisheries Act: <i>For offences involving using prohibited fishing methods, offenders are liable to fines of up to \$15,000, forfeiture of equipment and seizure of catch.</i> Turtles Ordinance: <i>Fines up to \$1,000, forfeiture of equipment and seizure of catch.</i>

Table 3.1.a A summary of all legislation relevant to the harvest of turtles and their eggs, and the sale of turtle products in Anguilla, Bermuda and BVI. (NA - Not Applicable).

Legislation provisions	Anguilla	Bermuda	British Virgin Islands
Protected Area Legislation	Marine Parks Act, Chapter M30, Revised Statutes of Anguilla; Marine Parks Regulations, Chapter M30-1, Revised Regulations of Anguilla. ^{3.1.2}	The Fisheries (Protected Areas) Order 2000	Marine Parks and Protected Areas Act, 1979, Marine Parks and Protected Areas Regulations, 1991
Penalties	<i>A fine of EC\$5,000 or a term of imprisonment of 6 months, and in the case of a continuing offence to a further fine of EC\$100 for each day on which the offence continues (for non-Anguillians fishing turtles in a marine park – superseded by moratorium).</i>	<i>Imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine, and forfeiture of any fish so taken and any vessel, instrument and equipment used in such taking.</i>	<i>For conviction on indictment, fine up to \$1,000 and imprisonment for 1 year, or for summary conviction, fine up to \$500, imprisonment for a term of 6 months, or to both such fine and imprisonment.</i>

Table 3.1.b. A summary of all legislation relevant to protected habitats of marine turtles in Anguilla, Bermuda and BVI.

Depletion and extinction of turtle nesting populations in the Overseas Territories will not only deprive the Territory inhabitants of a rich and valuable natural resource, but will also have adverse impacts on the foraging populations elsewhere in the region to which the Territory nesting populations contribute.

The harvest of nesting female turtles in recovering populations should be completely prohibited in any harvest legislation. When given complete protection, nesting populations appear to have the capacity to recover rapidly, as is currently being shown by the leatherbacks of Tortola, and by nesting populations of other species around the Caribbean (IUCN 2002; Seminoff 2004).

Closed seasons for turtle harvest should be set to begin before the onset of the nesting season. Adult turtles are generally believed to mate within proximity of the nesting beach and about one month prior to when the female nests. A closed season that begins one month prior to the composite nesting season of all appropriate species will mitigate accidental capture (for example, in nets) of mating turtles prior to the nesting season. Some current harvest legislation already provides closed seasons, perhaps in recognition of the need to protect nesting females, but again, the legislation was drafted at a time when there was incomplete knowledge of marine turtle nesting seasonality. In most cases, the closed season period requires revision.

Table 3.1 (a-f) presents an overview of the current legislation in the UK Overseas Territories pertinent to the take and sale of marine turtles and their products, including marine protected areas legislation and, where appropriate, national legislation that transposes the Convention on International Trade in Endangered Species (CITES) into domestic legislation. This legislation is briefly described

here and TCOT's recommended amendments are outlined and discussed in section 3.3.

3.1.1. Anguilla

Anguilla hosts nesting and foraging populations of green and hawksbill turtles, nesting populations of leatherback turtles, and occasional foraging loggerheads. (See section 4 for further discussion).

Prior to 1995, the harvest of turtles and their eggs in Anguilla was regulated by the Fisheries Protection Regulations 1988, which was an updated version of Anguilla's original Turtle Ordinance gazetted in 1947. The Fisheries Protection (Amendment) Regulations, 1995 introduced a 5-year moratorium on the harvest that was extended for a further 5 years from the 15th December 2000 under the Fisheries Protection Regulations, Chapter F40-1.

The penalty for violating the current moratorium is a fine of up to EC\$50,000 or up to 1 year imprisonment. For a second or subsequent offence, a fine of EC\$250,000 and imprisonment for 2 years or both such fine and imprisonment applies. These penalties are significantly more severe than most other offences under the Fisheries Protection Regulations. This penalty was repeatedly criticised by respondents to the TCOT SEQ, and the point was raised that that such a high initial penalty might even discourage the Department of Fisheries and Marine Resources (DFMR) from prosecuting offenders. Since 1995, the authorities have apprehended a few individuals for breaking the moratorium, but no prosecutions have resulted from these cases (see section 4).

The TCOT SEQ revealed that most interviewees perceived turtle fishing as the main reason for a perceived decline in Anguilla's turtle populations prior to the moratorium. The

Legislation provisions	Anguilla	Bermuda	British Virgin Islands
Domestic CITES legislation	Legislation in draft	Protected Species Act 2003	Endangered Animals and Plants Act, 1987 (Cap. 89)
Penalties	NA	See above	<i>Fine up to \$1,000 or to imprisonment for 12 months for provision of false information on application for export/ import license, or forfeiture of article if unlawfully exported from or imported to the BVI.</i>

Table 3.1.c. A summary of domestic CITES legislation relevant to the harvest of turtles and their eggs, and the sale of turtle products in Anguilla, Bermuda and BVI (NA - Not Applicable).

Fisheries Protection Regulations, 1988 would not have facilitated sustainable turtle populations for a number of reasons, and this perceived decline possibly reflects real historical trends in Anguilla's turtle populations. Harvest of turtles at sea, nesting females and turtle eggs were all permitted between the 1st of October and the 31st May in any year, and the minimum size limit for harvested turtles was 20lb (9.07kg). Turtle eggs, nesting females and older age classes within the foraging populations were therefore legally targeted.

CITES does not extend to Anguilla and therefore there is no national legislation that regulates the import or export of marine turtles. Prior to the moratorium there was a strong demand for Anguillian turtle meat and shells from other Caribbean states (e.g. St Martin, Puerto Rico, USVI). By the early 1980s, the levels of turtle harvest had reached unprecedented levels, primarily because lobster fishermen and spear fishermen began targeting turtles to benefit from the overseas demand for hawksbill shell (Meylan 1983). While spear fishing is highly selective, it is also relatively efficient compared to hand capture, and a change to extensive use of spear guns could have increased the number of turtles caught beyond sustainable levels.

TCOT SEQ interviews revealed that prior to the moratorium, former egg collectors harvested eggs throughout the nesting season, with peak egg collection occurring in the middle of the closed season. Furthermore, harvest of nesting females would have deleteriously impacted the nesting populations, especially if the closed season was flouted for nesting females in the same way as it was for eggs. The full nesting seasons for the turtles species found in Anguilla are unknown, but recent (but incomplete) monitoring efforts indicate that the nesting season for all species of marine turtle in Anguilla extends from at least March to September. To get a more comprehensive picture of real nesting seasons, one must consider regional patterns. The leatherbacks nesting in USVI sometimes begin in February and the season can extend to August (Boulon *et al.* 1996), whereas the hawksbill nesting season in USVI is year round with peak nesting activity occurring between May and November (Starbird *et al.* 1999). Therefore, if we consider

that turtle nesting in Anguilla could extend from February to November, the old closed season would not have protected nesting leatherbacks during a significant period of their nesting season, and would not have protected hawksbills at the end of their nesting season. However, TCOT SEQ indicated that adult leatherbacks were rarely targeted and rarely became entangled in turtle nets.

The green turtle nesting season in USVI extends from May to October (in Hirth 1997) and so would largely have been covered by the old closed season, but early nesters entering Anguilla's waters to mate prior to nesting would not have been protected by the closed season and neither would females nesting at the tail-end of the season in October. Anguilla's nesting green turtle population has been small for the last few decades (Meylan 1983) and any take of the highly valued adult green turtles would have deleteriously impacted such a small population. Leatherback and loggerhead turtles appear to be relatively scarce in Anguilla's waters, and any occasional take of these species under the old fishery regime would have had a significant impact on the nesting leatherback population and the resident foraging population of loggerheads.

The moratorium was introduced in response to growing public and government concerns about the decline of Anguilla's foraging turtle populations. TCOT SEQ indicates a general perception that turtle populations have responded to the moratorium, although biological data describing recent trends in abundance have not been gathered. Heppell *et al.* (2003) suggest that small, depleted populations cannot withstand even moderate harvest, and without an understanding of Anguilla's real turtle population trends, it is prudent to proceed with caution when considering the reopening of a turtle fishery. However, TCOT recognises that some Anguillians desire the reopening of the turtle fishery and acknowledge that if the perceived turtle population increases are reflected by real trends in abundance, then Anguilla's foraging turtle populations may be able to sustain a limited fishery. In the event that a turtle fishery is reopened in Anguilla, TCOT recommends critical changes to the Fisheries Protection Regulations, 1988, as discussed in section 3.3 below.

3.1.2. Bermuda

Bermuda's waters host foraging populations of green and hawksbill turtles. There is no longer any turtle nesting in Bermuda. (See section 5 for further discussion).

The harvest of marine turtles and their eggs is prohibited under the Fisheries (Protected Species) Order 1978 of the Fisheries Act 1972, and will be under the Protected Species Act 2003, once a list of 'protected species' as defined under section 5 of the Act is completed (J. Gray (BAMZ) pers. comm. 2003). TCOT does not recommend any changes to this legislation, and the TCOT SEQ revealed little demand for access to turtles, their eggs or other products.

3.1.3. British Virgin Islands

BVI hosts nesting and foraging populations of green and hawksbill turtles, nesting populations of leatherback turtles and occasional foraging loggerheads. (See section 6 for further discussion).

The current turtle harvest in BVI is regulated by the Turtles Ordinance 1959 as amended 1986, while the Fisheries Act, 1997 prohibits certain fishing methods. The Ordinance permits the take of all species of turtles at sea weighing 20lb or over during an open season from the 1st of December to the 31st of March in any year (closed season April to November inclusive). Older age classes are therefore legally targeted in BVI's turtle fishery, although harvest of nesting females (on the beach and at sea within 100 yards of the shore) and their eggs is prohibited. Fishing with spear guns, SCUBA and explosives is prohibited under the Fisheries Act, 1997 and fishing within BVI's Marine Parks is prohibited by the Marine Parks and Protected Areas Regulations, 1991.

Loggerhead turtles are occasionally reported in BVI waters, and are therefore probably quite rare, but are not protected in BVI waters. Harvest of leatherbacks at sea is not prohibited, but nesting females are protected and therefore enjoy protection so long as they are on a beach or at sea and within one hundred yards of the shore.



Photo 3.4. The British Virgin Islands hosts the largest leatherback nesting population in the UK Overseas Territories in the Caribbean (Photo S. Gore).

BVI has the longest closed season for marine turtle harvest of all the Caribbean OTs that still permit turtle harvest, and would provide sufficient protection to nesting green and hawksbill turtles if an appropriate maximum size limit was also imposed. TCOT SEQ did not reveal any reports of leatherback entanglement in nets set for other turtle species, although incidents of entanglements in ropes have been reported. TCOT recommends legislative changes for BVI in section 3.3 below.

3.1.4. Cayman Islands

The Cayman Islands host nesting and foraging populations of green and hawksbill turtles and a nesting population of loggerhead turtles. (See section 7 for further discussion).

The Marine Conservation (Turtle Protection) Regulations 1996 regulate the turtle fishery and provide for the most comprehensive and regulated turtle fishery of all the OTs. All species of turtle can be harvested between the 1st of November and the 30th of April in any year, with minimum size limits set at 120lbs for green turtles and 80lbs for hawksbills and loggerheads. The larger size classes are therefore specifically excluded from protection, and while the harvest of nesting females is not specifically prohibited, all turtles must be caught outside of the 'reef crest' and therefore cannot be taken on the beaches. Harvest of eggs is prohibited and turtles may not be taken with harpoons or spear guns. The fishery has been licensee-only since 1978, and there are only 24 islanders who can apply for a turtle fishing license from the Cayman Island Department of Environment (CIDoE). Eligible licensees are individuals from families that have a long tradition of turtling. Licenses are non-transferable, and under the current legislation, the fishery will die with the last of the 24 traditional turtle fishermen. Only 8 of these fishers have current licenses, and each is allowed a quota of 6 turtles per open season. All harvested turtles must be fitted with CIDoE issued tags after capture and presented to CIDoE for inspection, biometric measurement and genetic sampling prior to slaughter.

Turtles may not be taken along West Bay Beach, in George Town Harbour (Grand Cayman), or in any of the bays or sounds within the reef crest and may not be fished in any Marine Park or Environmental Zone as defined in the Marine Conservation (Marine Parks) Regulations (1996 Revision).

The combined nesting seasons of green, hawksbill and loggerhead turtles in the Cayman Islands extend from May to September (Aiken *et al.* 2001). Hence, the current closed season does not necessarily mitigate the capture of female loggerhead turtles (nesting season from May to August) entering Cayman's waters in April to mate in preparation for nesting in May. Data on legally recorded captures of marine turtles show only 3 loggerheads captured from 1999 to 2004 (see Table 7.9), but any take of adult loggerheads in Cayman's waters could adversely impact the recovery of the island's small nesting population.

TCOT recommends a number of changes to the legislation summarised above, as discussed in section 3.3.

Legislation provisions	Cayman Islands	Montserrat	Turks and Caicos Islands
Harvest legislation¹	The Marine Conservation (Turtle Protection) Regulations 1996	Turtles Ordinance Cap. 112 1951 ^{3,1,4}	Fisheries Protection Ordinance (1998)
Harvest, sale and possession of turtle eggs & nesting females	Harvest of eggs is prohibited unless by a person with a license issued by the Marine Conservation Board. Nesting females not specifically protected in the legislation.	Allowed with conditions.	Prohibited
Open season	NA	Nesting females and eggs can be harvested, possessed, bought and sold from October through to May inclusive.	NA
At sea capture, sale and possession	Board-issued license holders (traditional turtle fishermen) only can fish for turtles in Cayman. There are currently 24 such fishermen and in 2003 only 8 had renewed their licenses.	Allowed with conditions	Allowed
Open season	November through to April inclusive	October through to May inclusive.	Harvest allowed year round
Quota	Licence use stipulates a maximum of 6 turtles shall be caught per licensed person per season	No Quotas	No Quotas
Size restrictions	Captured green turtles must weigh at least 120lbs (54.4kg), whereas hawksbill and loggerhead turtles must weigh at least 80lbs (36.4kg)	Captured turtles must weigh at least 20lbs (9.07kg).	Hawksbill and green turtles must measure 20inches (50.8cm) from the neck scales to the tailpiece and weigh at least 20lbs (9.07kg). Any other turtles must weigh at least 20lbs (9.07kg)
Species restrictions	Green, hawksbill and loggerheads only are mentioned in the license stipulation although the Marine Conservation (Turtle Protection) Regulations 1996 apply to all extant marine turtle species.	No species restrictions	No species restrictions
Geographical restrictions	Turtles may not be taken along West Bay Beach or in George Town Harbour (Grand Cayman), or in any of the bays or sounds within the reef crest. Turtles may not be fished in any Marine Park Zone or Environmental Zone as defined in the Marine Conservation (Marine Parks) Regulations (1996 Revision)	Limited fishing within the Maritime Exclusion Zone.	Capture of turtles in National Parks is prohibited.
Method restrictions	Turtles may not be taken with harpoons or spear guns.	No gear restrictions.	Use of spear gun and Hawaiian sling is prohibited
Penalties	<i>The Marine Conservation (Turtle Protection) Regulations 1996: Fine of \$5,000 and to imprisonment for twelve months.</i> <i>Marine Conservation (Marine Parks) Regulations (1996 Revision): Fine of \$500,000 and imprisonment for twelve months; confiscation of any vessel or equipment used for the purpose of committing or facilitating the offence or intended to be used for the offence.</i>	<i>Turtles Ordinance: Fine of up to EC\$48 and forfeiture of equipment used in the offence.</i> <i>Fisheries Act: Fine of up to EC\$25,000 and six months imprisonment.</i>	<i>Harvesting undersized turtles or collecting or possessing eggs: Fine of \$5,000 and/ or imprisonment for 6 months.</i> <i>Use or possession of spear gun or Hawaiian sling: Fine of \$50,000 and/ or imprisonment for 12 months.</i>

Table 3.1.d. A summary of all legislation relevant to the harvest of turtles and their eggs, and the sale of turtle products in the Cayman Islands, Montserrat and TCI. (NA - Not Applicable).



Photo 3.5. Marine turtle nests are completely protected in the Cayman Islands (Photo P. Richardson).



Photo 3.6. The harvest of nesting females is permitted at certain times of year in Montserrat (Photo J. Jeffers).

3.1.5. Montserrat

Montserrat hosts nesting and foraging populations of green and hawksbill turtles, with leatherback and loggerhead nesting rarely reported and occasional loggerheads reported foraging in Montserrat's waters. (See section 8 for further discussion).

The Turtles Ordinance Cap 112(1951) regulates Montserrat's turtle harvest. It permits the harvest of any turtle weighing at least 20lbs, the harvest of nesting females, and the harvest of eggs. The open season for turtle and egg harvest extends from the 1st of October to the 31st May in any year. This fishery therefore targets the older age classes, including nesting females and allows harvest of eggs.

TCOT surveys suggest that the combined turtle nesting seasons for green and hawksbill turtles in Montserrat extend from June to October. The closed season therefore does not mitigate the capture of nesting turtles in October or the capture of female turtles arriving in Montserrat's waters to mate in May prior to nesting in June. TCOT therefore recommends some amendments to this legislation, as discussed in section 3.3 below.

3.1.6. Turks and Caicos Islands

The Turks and Caicos Islands (TCI) host nesting and foraging populations of hawksbill and green turtles, while occasional foraging loggerhead turtles are reported. Fletemeyer (1983) also suggests that loggerheads nest in the TCI. Although TCOT found no physical evidence of loggerhead nesting, it must be noted that TCOT nesting surveys were far from complete. Furthermore, 32.6% (n=30) of the TCOT SEQ respondents identified loggerheads as a species that nests in TCI. Some loggerhead nesting cannot be discounted and this must be taken into consideration when amending the harvest legislation. If there is loggerhead nesting in TCI, it is likely to be low-level, and every effort should be made to protect it. (See section 9 for further discussion).

The TCI turtle harvest is regulated under the Fisheries Protection Ordinance (1998). This legislation permits the year round take of any turtles weighing at least 20lbs, but the use of spear guns and Hawaiian slings is prohibited. Harvest of nesting females and their eggs is prohibited and turtle fishing is prohibited within TCI's extensive network of National Parks under the National Parks Ordinance, 1998, Cap. 80. TCOT SEQ and sampling has revealed that illegal turtle fishing occurs in TCI's protected areas,

Legislation provisions	Cayman Islands	Montserrat	Turks and Caicos Islands
Protected Area Legislation	Marine Conservation Law, 1978 (1995 Revision); Marine Conservation (Marine Parks) Regulations (1996 Revision)	Forestry, Wildlife, National Parks and Protected Areas Ordinance 1996	National Parks Ordinance, 1998, Cap. 80
Penalties	See above	Fines up to EC\$5,000 and six months imprisonment	Fine of \$50,000 or a term of imprisonment for 12 months or both, or in the case of a continuing offence, \$100 for every day or part of a day on which the offence continues

Table 3.1.e. A summary of all legislation relevant to protected habitats of marine turtles in the Cayman Islands, Montserrat and TCI (NA - Not Applicable).

Legislation provisions	Cayman Islands	Montserrat	Turks and Caicos Islands
Domestic CITES legislation	The Endangered Species (Trade and Transport) Law (2004 revision)	Endangered Animals and Plants Ordinance 1976	Legislation in draft
Penalties	<i>A fine of US\$500,000 or imprisonment for 4 years or both, and forfeiture of article if unlawfully exported or imported</i>	<i>For provision of false information when applying for a license, fine up to EC\$500 or up to 6 months imprisonment, or forfeiture of article if unlawfully exported or imported</i>	NA

Table 3.1.f. A summary of domestic CITES legislation relevant to the harvest of turtles and their eggs, and the sale of turtle products in the Cayman Islands, Montserrat and TCI (NA - Not Applicable).

particularly the Nature Reserve along the southern shores of North, Middle and East Caicos (a wetland of international importance designated under the Ramsar Convention). The TCI Protected Areas Department (PAD) and Department of Environment and Coastal Resources (DECR) will need to address the issue with increased enforcement patrols, and increased public awareness amongst the fishermen regarding fishing practices within protected areas.

TCI's harvest regulations specifically allow the harvest of older age classes and do not protect reproductive females at sea. Fletemeyer (1983) suggests that the combined nesting season for turtle species nesting in TCI extends from April to August, but the turtle nesting season is largely unknown. TCOT surveys revealed hawksbill and green turtle nesting on some remote Cays during September 2002. In nearby Cuba, the hawksbill season extends from August to February, with peak nesting activity occurring between September and January (Moncada *et al.* 1999). Green turtle nesting in the Bahamas occurs from June to September (in Hirth 1997). In the absence of reliable turtle nesting seasonality data from TCI, and based on regional seasonality, it is reasonable to expect the combined green and hawksbill nesting seasons in TCI extend from June to January.



Photo 3.7. Adult green turtle landed at Cockburn Harbour, South Caicos in September 2002 (Photo P. Richardson).

CITES does not extend to TCI and therefore there is no domestic legislation that regulates the export of marine turtles from TCI. TCOT recommends several amendments to the country's legislation as discussed in section 3.3 below.

3.2. Multi-lateral environmental agreements (MEA's) and turtle harvest legislation

There are four widely ratified MEAs that require contracting Parties to provide specified protection for marine turtles, and these are briefly discussed in this section. Table 3.2 provides an overview of the status of these MEAs in each UK Overseas Territory in the Caribbean.

3.2.1. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) *Adapted from* ©Joint Nature Conservation Committee, www.jncc.gov.uk

CITES was adopted in Washington DC, USA in March 1973 and entered into force in July 1975. The UK ratified CITES in August 1976. The Convention aims to regulate international trade in endangered species or those species that may become endangered if trade is not regulated and controlled. CITES lists species in Appendices I, II and III, with different trade restrictions applying to the different appendices. All species of marine turtle are currently listed in CITES Appendix I, and therefore international commercial trade in wild marine turtles and their parts is prohibited between all contracting Parties to CITES.

The convention provides for Parties to enter reservations on CITES Appendix listed species. A reservation allows the Party to be exempt from the provisions of the Convention relating to trade in named species listed in the Appendices. While the reservation is in effect, the Party is formally treated as a non-Party with respect to trade in the species (or specimen) concerned. However, the convention recommends that Parties that have entered reservations for Appendix I species should treat the species as if it were in CITES Appendix II and should therefore monitor trade in these species and report any trade to the Secretariat.

CITES currently extends to Bermuda, British Virgin Islands, Cayman Islands, and Montserrat, and legislation that

UKOT	CITES ¹	CMS ²	SPAW Protocol ³	IAC ⁴
Anguilla	Does not currently extend to Anguilla - high priority	Does not extend - medium priority	UK has not ratified	UK has neither signed nor ratified
Bermuda	Extends to Bermuda	Extends to Bermuda	NA	UK has neither signed nor ratified
BVI	Extends to BVI	Extends to BVI	UK has not ratified	UK has neither signed nor ratified
Cayman Islands	Extends to Cayman	Extends to Cayman	UK has not ratified	UK has neither signed nor ratified
Montserrat	Extends to Montserrat	Extends to Montserrat	UK has not ratified	UK has neither signed nor ratified
TCI	Does not currently extend to TCI - high priority	Extends to TCI	UK has not ratified	UK has neither signed nor ratified

¹ **CITES** – Convention on International Trade in Endangered Species

² **CMS** – Convention on Migratory Species

³ **SPAW Protocol** – Protocol Concerning Specially Protected Areas And Wildlife (SPAW) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region

⁴ **IAC** – Inter-American Convention for the Protection and Conservation of Sea Turtles

Table 3.2. Status of MEA's with provisions for the protection of marine turtles and whose geographical scope includes the Wider Caribbean (Source: FCO).

transposes CITES to domestic law is described briefly below and in tables 3.1.c and 3.1.f.

Bermuda: The commercial export of 'protected species' is prohibited under the Protected Species Act, 2003, although a list of protected species under this Act has not yet been finalised.

British Virgin Islands: The commercial export of marine turtles from BVI is prohibited under the Endangered Animals and Plants Act, 1987 (Cap. 89). Import and export of live or dead turtles of all Caribbean species is prohibited under the Act, as is the export any shell, scales and claws of '*any animal of the family Cheloniidae*'. Curiously, export of shell, scales or claws is not prohibited if the objects are '*cut to shape*'.

Cayman Islands: The Endangered Species (Trade and Transport) Law (2004 revision) fully transposes CITES to domestic law. Import, export and re-export of all turtle products must be accompanied by permits from relevant authorities in the Cayman Islands and destination/source countries. As Appendix I species, permits for marine turtle products would not be issued for commercial purposes (G Ebanks-Petrie (CIDoE) pers. comm. 2004).

Montserrat: All marine turtle species are listed in Schedule 1 of the Endangered Animals and Plants Ordinance, 1976, and therefore the import and export of live and dead specimens of all marine turtle species is specifically

prohibited. This Ordinance also states that the importation and exportation of articles listed in Schedule 3 is also prohibited. However, Schedule 3 includes '*The shell and scales, whether unworked or simply prepared but not if cut to shape, the waste of the shell and scales, and the claws of any animal of the family Cheloniidae.*' Therefore, this Ordinance does not currently prohibit the import or export of turtle products that are cut to shape (e.g. tortoiseshell jewellery).

Anguilla and TCI: CITES does not extend to Anguilla and the Turks and Caicos Islands, but both these Territories consider CITES extension as high priority and are in the process of preparing appropriate domestic legislation (K. Hodge (Govt. of Anguilla) pers. comm. 2003; J Campbell (DECR) pers. comms. 2003). Meylan (1983) and the TCOT SEQ indicate that foreign demand for turtle products from neighbouring Caribbean states, including St Martin, Puerto Rico, St Lucia and the US Virgin Islands, triggered the high and possibly unsustainable levels of turtle harvest witnessed in Anguilla prior to the moratorium (see section 4). St Martin, Puerto Rico, St Lucia and the US Virgin Islands have now all acceded to CITES and therefore the demand for Anguillian turtle products from overseas has probably declined. However, extension of CITES to Anguilla would provide for the regulation of any commercial export trade of turtle products to non-CITES states in the region (e.g. Haiti), therefore minimising the potential for Anguilla's turtle populations to be adversely impacted by significant future foreign demand.

In TCI, TCOT SEQ interviewees corroborated claims in Fleming (2001) by suggesting that hawksbill turtle shell harvested in TCI waters is currently smuggled out of the country by Dominican and Haitian migrant fishermen (see section 9). Future CITES extension to TCI is therefore particularly important with respect to enforcing against this potentially damaging and unmonitored trade.

3.2.2. Convention on Migratory Species (CMS or Bonn Convention)

Adapted from ©Joint Nature Conservation Committee, www.jncc.gov.uk

CMS was adopted in Bonn, Germany in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral Agreements for the conservation and management of migratory species that require or would benefit from international cooperation (listed in CMS Appendix 2), and by undertaking co-operative research activities.

The UK ratified the Convention in 1985, but it does not currently extend to Anguilla (D. Dudgeon (FCO) pers. comm. 2003). All Caribbean species of marine turtle are listed on Appendix I of the CMS. Species in this appendix receive the highest levels of protection under CMS, and Article III, clause 5 reads:

‘Parties that are Range States of a migratory species listed in Appendix I shall prohibit the taking of animals belonging to such species. Exceptions may be made to this prohibition only if:

- a) the taking is for scientific purposes;*
- b) the taking is for the purpose of enhancing the propagation or survival of the affected species;*
- c) the taking is to accommodate the needs of traditional subsistence users of such species; or*
- d) extraordinary circumstances so require; provided that such exceptions are precise as to content and limited in space and time. Such taking should not operate to the disadvantage of the species.’*

It is therefore possible that the UK is not satisfying its obligations under this convention, with respect to the legal and commercial harvest and trade of turtles currently regulated in Cayman Islands, BVI, Montserrat and TCI. The term *‘traditional subsistence users’* is not defined by the convention text, but regardless of the ambiguity of this term, the UK does not have any current reservations to Article III registered on behalf of any its Overseas Territories.



Photo 3.8. Regional demand for turtle products, such as these old hawksbill turtle scutes in a fisher's garden, has probably declined in the last 20 years (Photo P. Richardson).

3.2.3. Protocol Concerning Specially Protected Areas And Wildlife (SPA) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region

The Cartagena Convention is the only legally binding environmental treaty for the Caribbean region and includes the Gulf of Mexico, the Caribbean Sea and adjacent areas of the Atlantic Ocean (Fleming 2001). The Convention was adopted in 1983, when the Protocol to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region (Oil Spills Protocol) was also adopted. Both the Cartagena Convention and the Oil Spills Protocol entered into force in 1986 after having been ratified by 9 governments. In addition, the Convention opened the **Protocol Concerning Pollution from Land-Based Sources and Activities** (The LBS Protocol) for signature in 1999.

The Convention is designed to facilitate national and joint management of coastal and marine resources within the region. It identifies sources of pollution that require control (i.e. pollution from ships, dumping, land-based sources and sea bed activities, as well as airborne pollution) and identifies environmental management issues that require co-operation between Parties, including specially protected

areas and wildlife, co-operation in cases of emergency, environmental impact assessment and scientific and technical co-operation (UNEP 2000a).

The UK ratified the Cartagena Convention and the Oil Spills Protocol on behalf of the Cayman Islands and Turks and Caicos Islands on 28 February 1986, and reserved the right to extend it at a future date to include other territories. On 21 November 1987, the Convention and the Oils Spills Protocol were extended to the British Virgin Islands. The UK has not signed or ratified the LBS Protocol.

Protocol Concerning Specially Protected Areas and Wildlife (SPA) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region was adopted by the Convention in 1990. The UK signed the SPAW Protocol in 1990, but is yet to ratify it. Although the UK remains committed to working towards ratification of the SPAW Protocol, this is entirely dependent upon the relevant Overseas Territories having the necessary domestic legislation in place (D. Dudgeon (FCO) pers. comm. 2004). Therefore none of the provisions of the SPAW Protocol currently apply to any of the UK Overseas Territories in the Caribbean.

This Protocol requires that Parties take the necessary measures to:

'protect, preserve and manage in a sustainable way:

- a) areas that require protection to safeguard their special value; and*
- b) threatened or endangered species of flora and fauna.'*

The six species of marine turtle found in the Wider Caribbean are included in Annex II of this Protocol.

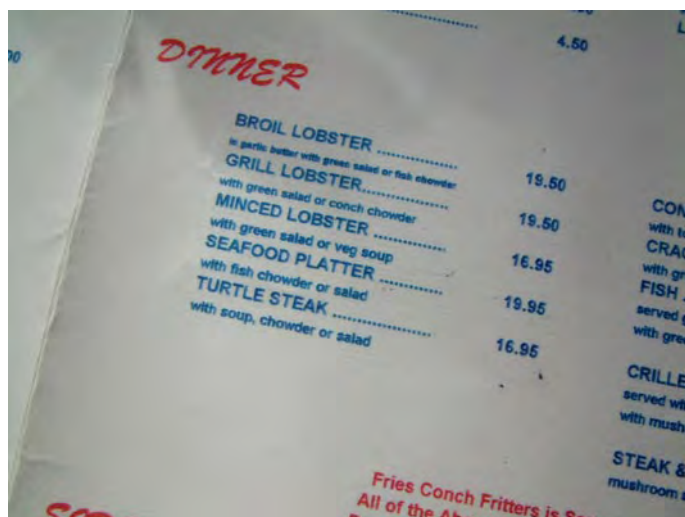


Photo 3.9. Given that Article III of CMS accommodates the needs of traditional subsistence users of marine turtles, the Overseas Territories Governments may have to consider the role of trade in subsistence economies, and limit commercial activities regarding the sale of turtle products (Photo S. Ranger).

Paragraph 1(b) of Article 11 '**CO-OPERATIVE MEASURES FOR THE PROTECTION OF WILD FLORA AND FAUNA**', reads,

'Each Party shall ensure total protection and recovery to the species of fauna listed in Annex II by prohibiting:

- (i) the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing) or commercial trade in such species, their eggs, parts or products;*
- (ii) to the extent possible, the disturbance of such species, particularly during periods of breeding, incubation, aestivation or migration, as well as other periods of biological stress.'*

However, Article 14 '**EXEMPTIONS FOR TRADITIONAL ACTIVITIES**', reads:

'Each Party shall, in formulating management and protective measures, take into account and provide exemptions, as necessary, to meet traditional subsistence and cultural needs of its local populations. To the fullest extent possible, no exemption, which is allowed for this reason, shall:

- (a) endanger the maintenance or areas protected under the terms of this Protocol, including the ecological processes contributing to the maintenance of those protected areas; or*
- (b) cause either the extinction of, or a substantial risk to, or substantial reduction in the number of, individuals making up the populations of species of fauna and flora within the protected areas, or any ecologically inter-connected species or population, particularly migratory species and threatened, endangered or endemic species.*

Parties which allow exemptions with regard to protective measures shall inform the Organization accordingly.'

It is presently unclear whether or not the legal turtle harvests in the UK Overseas Territories in the Caribbean are compliant with this Protocol, as there is little or no data regarding the extent of these harvests or on the abundance and trends of local marine turtle populations. In BVI, Montserrat and TCI the impacts of these harvests cannot yet be determined due a complete lack of long-term and consistent turtle fisheries data, however, Bell and Austin (2003) state that the current harvest in Cayman severely impacts the resident breeding population of marine turtles and hinders this depleted population's recovery (see section 7). This suggests that the Cayman harvest does not meet the requirements of the SPAW Protocol. The uncertainties presented by these unmonitored turtle harvests would need to be addressed before the UK considers ratification of the SPAW Protocol. Bermuda lies outside of the geographic scope of the Cartagena Convention.

3.2.4. Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC)

The IAC entered into force in 2001 and is the only international treaty dedicated exclusively to sea turtles (Hykle 2002). It covers the '*land territory in the Americas of each of the Parties, as well as the maritime areas of the Atlantic Ocean, the Caribbean Sea and the Pacific Ocean*'. To date, the IAC has been ratified by Brazil, Belize, Costa Rica, Ecuador, Honduras, Mexico, the Netherlands, Peru, USA and Venezuela (www.seaturtle.org/iac). The UK has neither signed nor ratified this treaty and accordingly, the provisions of the convention do not currently apply to any of the UK Overseas Territories in the Caribbean.

The IAC requires Parties to protect and conserve marine turtle populations and habitats; to reduce the incidental capture, injury and mortality of marine turtles due to commercial fisheries; to prohibit the intentional harvest, international and domestic trade in turtles and turtle products; and encourage international cooperation in research and management programmes.

Article IV requires that Parties prohibit '*the intentional capture, retention or killing of, and domestic trade in, sea turtles, their eggs, parts or products*'. Exceptions are allowed to '*satisfy economic subsistence needs of traditional communities*', but Parties allowing such exceptions must '*establish a management program that includes limits on levels of intentional taking*.' Again, the largely unmonitored but legal harvests of marine turtles in the UK Overseas Territories in the Caribbean probably do not satisfy the requirements of the IAC. This issue would need some resolution if the UK were to sign this treaty on behalf of those Territories.

3.3. TCOT Recommendations for Changes to National Legislation

In this section, TCOT presents recommendations regarding amendments and progress with the pertinent legislation in all the UK Overseas Territories in the Caribbean. Table 3.3 presents an overview of the recommended changes to national marine turtle harvest legislation in each Territory.

3.3.1. Anguilla

Amendments to environmental legislation and policy to facilitate the effective management and protection of marine resources in Anguilla, including turtles, should be given priority. TCOT acknowledges that recent successful bids by the Government of Anguilla for funding from the Foreign and Commonwealth Office Overseas Territories Environment Programme (OTEP) will facilitate vital amendments to environmental legislation including some of the recommendations below.

Prior to the Fisheries Protection (Amendment) Regulations, 1995, the legislation that regulated the harvest of marine turtles and their eggs in Anguilla did not facilitate the sustained management of the country's nesting and foraging populations of marine turtles. Indeed, the harvest may also

have impacted nesting and foraging populations of turtles found elsewhere in the Wider Caribbean Region.

TCOT recognises that cessation of all marine turtle fishing is likely to facilitate recovery of depleted turtle populations. However, in Anguilla, despite a 9 year moratorium on turtle harvest, the data that would allow for a scientific assessment of the status of turtles and recommendations on future management options are only now beginning to be gathered.

TCOT recognises that turtle meat is a component of the traditional Anguillian diet and that turtle populations may recover to an extent that they could support a future limited sustainable harvest of green and hawksbill turtles. A requirement of any future harvest of turtles is that it is carried out in a regulated and controlled manner, with programmes in place to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured decreases in turtle stock. If DFMR are responsible for the management of a future turtle fishery, it is vital that they have the skills and the human, technical and financial resources for effective monitoring. TCOT does not believe that this is currently the case and it is unlikely that such resources could be put in place by the end of 2005. TCOT therefore believes that effective management and monitoring of a turtle fishery cannot currently be guaranteed.



Photo 3.10. Carlos Sasso (DFMR) with a sub-adult green turtle sampled during TCOT. DFMR officers must be provided with the necessary training and resources if they are to effectively manage a future turtle fishery in Anguilla (Photo P. Richardson).

Prohibition of egg harvest	Specific prohibition of nesting female harvest	Change size limits	Prohibition of harvest of leatherback & loggerhead turtles	OT-specific amended closed seasons
Anguilla: Fisheries Protection Regulations				
NA	NA	NA	NA	NA
Notes & overall TCOT recommendations for Anguilla: Replace moratorium with 3-year, participatory research programme (see section 3.3.1 below)				
Bermuda: Protected Species Act 2003				
NA	NA	NA	NA	NA
Notes & overall TCOT recommendations for Bermuda: Turtle harvest already prohibited				
BVI: The Turtles Ordinance 1959 as amended 1986				
No change recommended	No change recommended	Change recommended	Change recommended	No change recommended
Notes & overall TCOT recommendations for BVI: 'Fisheries Regulations 2001' pending but draft needs attention (see section 3.3.3 below)				
Cayman Islands: The Marine Conservation (Turtle Protection) Regulations 1996				
No change recommended	Change recommended	Change recommended	Change recommended	Extend closed season from April to October inclusive
Notes & overall TCOT recommendations for the Cayman Islands: The turtle fishery licensing scheme operated in Cayman may serve as a model for the other UKOT's that plan to continue (or reinstate) their turtle harvests				
Montserrat: Turtles Ordinance Cap. 112 1951				
Change recommended	Change recommended	Change recommended	Change recommended	Extend closed season to March to November inclusive
Notes & overall TCOT recommendations for Montserrat: Turtle Act 2002 pending but first draft needs attention (see section 3.3.5 below)				
TCI: Fisheries Protection Ordinance (1998)				
No change recommended	No change recommended	Change recommended	Change recommended	Introduce a closed season from July to January inclusive
Notes & overall TCOT recommendations for TCI: Significant changes recommended				

Table 3.3. TCOT recommended changes to marine turtle harvest legislation.

Therefore, TCOT recommends replacing the moratorium on turtle fishing in Anguilla with a 3 year active and participatory research programme. For the duration of this research programme there should be no harvest of marine turtles in Anguillian waters. The programme should assess the viability of establishing a highly regulated experimental turtle fishery by 2009 and should be characterised by active involvement of fishers and open dialogue between all stakeholders. Capacity building to ensure that the DFMR

will be equipped to effectively manage a turtle fishery, should it be established, should begin immediately.

While making this recommendation, TCOT would like to highlight and acknowledge that fishers appear to have been largely compliant with the moratorium since 1995. TCOT SEQ interviews indicate that fishers perceived that the aim of this temporary legislation was to facilitate turtle population recovery and allow the authorities to measure

population recovery through monitoring. Inaction on the part of the relevant authorities on this matter means that it is not currently possible to ascertain whether the desired increase in the turtle population has occurred. In the absence of any long term, meaningful research, the fishers have repeatedly been asked to compromise and to date have been given no scientific justification for this compromise – hence the TCOT recommendation that fishers should be at the heart of future research. In order to facilitate fisher participation in this research, funding should immediately be sought to initiate the recommended research programme, which should include financial incentives for fisher participation.

In the event of a future marine turtle harvest in Anguilla, TCOT recommends that there are a number of legislative changes required to facilitate the sustainability of such a harvest. In addition, Anguilla's turtles face a host of threats imposed by the growing human population (2004 estimate: 1.98%, www.cia.gov) and the rapid growth of tourism. The regulation of use alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations regarding legislation changes to facilitate protection of critical marine turtle habitat in Anguilla:

3.3.1.1. Amend the Fisheries Protection Regulations

Short to medium term

- a) The Advisory Committee described in section 4.1.1.2 should immediately start to seek funding for a participatory marine turtle research programme and solicit the participation of interested fishermen in the in-water and nesting beach monitoring and sampling regimes described in section 4.
- b) Change the current penalty for contravening the moratorium under the Fisheries Protection regulations, to a more appropriate penalty in line with other offences under the Act (e.g. Fine of EC\$5,000 and or imprisonment for up to 12 months).

Long-term

Once abundance trends of green and hawksbill turtles have been established through the programmes described below, and if they are deemed favourable to reopen a turtle harvest, amend the Fisheries Protection Regulations as follows:

- a) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.
- b) Ensure a closed season that protects breeding turtles in Anguillian waters from the 1st of April to the 30th of November inclusive, to be reviewed every five years (in order to react to possible shifts in nesting seasons due to climate change).
- c) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating

a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for all harvested turtle species that should be stipulated in any amended legislation.

- d) Consider a continued minimum size limit, as most fishermen already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for all harvested turtle species that should also be stipulated in any amended legislation.
- e) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers are required to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to DFMR (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by DFMR. Quotas should be reactive and based, inter alia, on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The DFMR should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level*.
- f) Establish regulations with regard to the type of gear that can be used to capture turtles. Possible regulations could ensure permanent and complete prohibition of all turtle capture methods excluding hand capture and use of turtle nets, with strict specifications for legal net structure and use.
- g) Ensure prohibition of the harvest of loggerhead and leatherback turtles in Anguillian waters. The Government of Anguilla have also expressed that they would recommend prohibition of any future take of hawksbill turtles.

NB. Any future turtle fishery must be accompanied with systematic monitoring regimes as described in section 4, along with a programme to monitor Catch per Unit Effort of licensed fishermen, and biometrics of turtle catch, which should also be implemented by the DFMR. In the event of the reopening of Anguilla's turtle fishery, the Fisheries Protection Act must be further revised to provide statutory powers to react to the ongoing results of the abundance trend monitoring programmes. In the event of declining abundance trends or declining Catch per Unit Effort below pre-established thresholds, the DFMR must have the power to temporarily or permanently close the turtle fishery.

3.3.1.2. Amend the Marine Parks Act

Anguilla's Marine Parks provide important habitat for foraging populations of juvenile and sub-adult green and hawksbill turtles. Island Harbour and Little Bay support relatively large numbers of green turtles, whereas hawksbills are encountered in all the Marine Parks. In order to facilitate

turtle population recovery, it is important that these areas are free of disturbance and take by turtle fishermen under any future harvest regime. To facilitate this Management Plans should be drafted for all marine parks to ensure the effective implementation and enforcement of Marine Parks Regulations and, the Marine Parks Act should be amended to:

- a) Ensure that all five 'designated' marine parks are fully described in Schedule 1 of the Marine Parks Regulations.
- b) Ensure that marine turtles have permanent and complete protection within Anguilla's Marine Parks. This should include no take zones as well as policies to curb potential negative tourism impacts e.g. through SCUBA diving and snorkelling.

3.3.1.3. Amend Planning Policy and Beach Protection Act

Anguilla's nesting marine turtles are at critically low levels. The adverse impacts of increased beachfront development on the nesting populations using Anguilla's mainland beaches must be considered, in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Anguilla, and therefore TCOT recommends the following legislative and policy changes:

- a) Revise the Planning Department's proposed Land Use Plan (1996) so that Captain's Bay and Savannah Bay and all land at least 100m landward of the high tide marks of these Bays are protected from the adverse impacts of development. E.g. by being re-designated as Conservation Areas.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, disturbance of nesting females and erosion on all other nesting beaches.
- c) Ensure that all developments that impact on marine turtle nesting or foraging habitat are required to undertake an environmental assessment that includes an evaluation of impacts and measures to mitigate negative impacts.
- d) Amend the Beach Protection Act (2000) in order to prohibit all sand mining at Windward Point (and any other turtle nesting beach), thereby allowing natural sand accretion and beach rehabilitation for marine turtle nesting.
- e) Under the guidance of the advisory committee (see 4.1.1.2), develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings and distribute recently produced National Trust advisory leaflet to all hotels to advise on mitigating against light pollution.

3.3.1.4. Recommendations regarding Multilateral Environmental Agreements

- a) Gazette legislation to transpose CITES to domestic law.
- b) Given that Article III of CMS allows for harvests to accommodate the needs of subsistence users of marine turtles, the Government of Anguilla may have to consider the role of trade in subsistence economies, and limit commercial activities regarding the sale of turtle products if it requests that the UK Government extend the Convention on Migratory Species (CMS) to Anguilla.

3.3.2. Bermuda

Bermuda's current legislation provides complete protection for all species of marine turtle found in her waters. TCOT makes no recommendations regarding this legislation, but urges the Government of Bermuda to finalise a draft of the list of protected species, to include all species of marine turtle, under the Protected Species Act, 2003.

3.3.3. British Virgin Islands

The legislation that currently regulates the harvest of marine turtles and their eggs in the British Virgin Islands does not facilitate the sustained management of the country's nesting and foraging populations of marine turtles.

TCOT recognises that cessation of all turtle fishing would significantly contribute to the recovery of depleted turtle populations in the BVI. TCOT also recognises that, although direct exploitation of marine turtles is no longer a major economic activity of many fishers, turtle meat is a component of the traditional BVI diet and trunk oil is highly valued. However, we recommend that any/all future harvest of turtles must be carried out in a highly regulated and controlled manner, with programmes in place to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured decreases in turtle stocks. Furthermore, if the CFD are responsible for the management of a future turtle fishery, it is vital that they have the human, technical and financial resources to effectively monitor the fishery and enforce supporting legislation.

TCOT recommends a number of legislative changes required to increase the likely sustainability of any harvest. In addition, it is noted that the regulation of use alone will not serve the sustainable management of turtles in the British Virgin Islands. TCOT therefore also makes recommendations regarding legislation and policy changes to facilitate protection of critical marine turtle habitat in the British Virgin Islands:

3.3.3.1. Harvest legislation recommendations

Although not monitored, the BVI turtle harvest is regulated by the Turtles Ordinance 1959 as amended 1986 and the Fisheries Act 1997. This legislation is not comprehensively upheld or enforced, e.g. as evidenced by the high prevalence of turtle meat at the Virgin Gorda Easter Festival

during the designated closed season for the turtle fishery 2004. We recommend a number of changes below. Any future harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in turtle abundance and adequate surveillance and enforcement.

In 2001, the Government of the BVI produced a draft document entitled *Fisheries Regulations, 2001*, that we were allowed to view. Sections 22, 26 and 27 dealt with regulations pertaining to the harvest of marine turtles and their eggs. Section 22 contained text that is contradictory to text in section 26 with respect to closed seasons for marine turtle harvest. Text in section 22 also contradicted the text of section 27 with respect to moratoria on the harvest of certain species of marine turtle. We felt that this needed reconsideration in order to become a more meaningful piece of legislation. The Regulations have now been gazetted, but we have not been able to obtain a final copy in time for this report. Based on the draft regulations, TCOT recommends the following amendments of the legislation to further facilitate sustainable harvest of BVI's foraging green and hawksbill turtles;

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for all harvested turtle species that should be stipulated in any amended legislation.
- b) Consider a continued minimum size limit, as most fishermen already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for all harvested turtle species that should also be stipulated in any amended legislation.
- c) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers are required to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to BVI CFD (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by CFD. Quotas should be reactive and based, inter alia, on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The CFD should have the statutory power to implement spot checks at fish landing sites to assess compliance, and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level.*
- d) Ensure prohibition of the harvest of loggerhead and leatherback turtles given their very low numbers in the BVI.

- e) Increase fines for infringements to a more punitive level in line with those recommended in other OTs.

***NB.** Any future turtle fishery must be accompanied by systematic monitoring regimes as described in section 6, along with a programme to monitor Catch per Unit Effort of licensed fishermen, and biometrics of turtle catch, which should also be implemented by the CFD.

3.3.3.2. Strengthen and enhance BVI's marine protected areas system

In order to preserve the marine biodiversity of the BVI, including marine turtles, it is recommended that the BVI marine parks are strengthened and extended. Current CFD-led monitoring of marine turtles will allow "hot spots" of marine turtle abundance to be defined and integrated within BVI National Park Trust (BVINPT) system plan for marine protected areas. From limited monitoring carried out to date it appears that the only important turtle nesting beach included in the National Parks Plan is Rogue's Bay, Tortola. Although coastal areas of Windlass Bight in Anegada are proposed for protection, this does not seem to be the most important area for turtle nesting in Anegada.

3.3.3.3. Amend planning policy and beach management

The nesting marine turtles of the British Virgin Islands undoubtedly represent remnants of depleted populations and are at critically low levels. However, the adverse impacts of increased beachfront development on the nesting populations using the beaches of the British Virgin Islands must be considered, in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in British Virgin Islands, and therefore TCOT recommends the following:

- a) Ensure that key nesting habitats highlighted by ongoing BVI CFD monitoring work are incorporated in the BVINPT systems plan and afforded protected status where no beachfront development will be permitted.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, nesting female disturbance and erosion on all other nesting beaches.
- c) Under the guidance of the working group, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.

3.3.3.4. Recommendations regarding Multilateral Environmental Agreements

- a) The Endangered Animals and Plants Act, 1987 (Cap. 89) should be amended to prohibit commercial import and export of turtles and all wild turtle products of marine turtle species, so that this legislation fully transposes CITES to domestic law.

- b) Given that Article III of CMS allows for harvests to accommodate the needs of subsistence users of marine turtles, the Government of BVI may have to consider the role of trade in subsistence economies, and limit commercial activities regarding the sale of turtle products.

3.3.4. Cayman Islands

It is felt by CIDoE that data from their ongoing in-water monitoring provide convincing evidence that the fishery should be closed, and they have made such a recommendation to the Marine Conservation Board (G. Ebanks-Petrie (CIDoE) pers. comm. 2004). Available data suggest the fishery, although small, as currently structured is likely to be affecting nesting population recovery. TCOT recognises that a complete ban on marine turtle fishing is the most effective management option to facilitate rapid and lasting recovery of depleted turtle populations in the Cayman Islands. TCOT also recognises that turtle meat is a component of the traditional Caymanian diet, but that in the Cayman Islands, turtle meat can be obtained from farmed stocks. Complete closure of the traditional turtle fishery may, however, be deemed politically and socially unacceptable. At minimum, it is recommended regulations governing the traditional harvest be altered.

In addition, the Cayman Islands' turtles face a host of threats imposed by the growing human population (2.71%, 2004 est.), and the regulation of utilisation alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations regarding legislation and policy changes to facilitate protection of critical marine turtle habitat in the Cayman Islands.

3.3.4.1. Harvest legislation recommendations:

While the Cayman Islands have relatively sophisticated regulations to monitor marine turtle harvest, this harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in turtle abundance. TCOT makes the following recommendations:

- a) Prohibit the capture of all adult marine turtles in Cayman waters. Ensure permanent and complete prohibition of the harvest of reproductively active turtles by extending the closed season to include the 1st of April to the 30th of November inclusive.
- b) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for all harvested turtle species that should be stipulated in any amended legislation.
- c) Consider a continued minimum size limit, as most fishermen already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved

carapace length for all harvested turtle species that should also be stipulated in any amended legislation.

- d) Ensure prohibition of the harvest of loggerhead and leatherback turtles.

3.3.4.2. Increase the network of Protected Areas in the Cayman Islands

- a) **Key nesting sites should be given protected status.** At present, none of the key nesting beaches in the Cayman Islands is afforded protected status. It is recommended that key nesting sites for marine turtles are given a high level of protection from the deleterious effects of inappropriate coastal development. While there is currently no legislation to implement this recommendation, the Draft National Conservation Law would provide the necessary legal framework. Therefore, TCOT recommends the immediate enactment of this law.

- b) **Key foraging sites should be given protected status.** Based on the ongoing and recommended expanded in-water monitoring programme, key foraging sites not already protected should be given protected status to ameliorate the effects of coastal development and recreational use. In so doing, it is likely that key coral reef and seagrass habitats will be preserved. The Draft National Conservation Law would provide a comprehensive framework for management of protected areas and species.

3.3.4.3. Recommendations regarding Multilateral Environmental Agreements

- a) TCOT recommends that the CIDoE be adequately resourced to implement the provisions of the recently enacted Endangered Species Trade and Transport Law, and that the necessary commencement orders be issued by Cabinet as soon as possible. When this legislation comes into effect, it should fully transpose CITES to domestic law.
- b) Given that Article III of CMS allows for harvests to accommodate the needs of subsistence users of marine turtles, the Government of the Cayman Islands may have to consider the role of trade in subsistence economies, and limit commercial activities regarding the sale of wild turtle products.

3.3.5. Montserrat

The current legislation that regulates the harvest of marine turtles and their eggs in Montserrat does not facilitate the sustainable management of the country's nesting and foraging populations of marine turtles.

TCOT recognises that cessation of all turtle fishing would significantly contribute to the recovery of depleted turtle populations. TCOT also recognises that turtle meat is a component of the traditional Montserratian diet and a

moratorium is unlikely to receive enough support from the fishing community, especially given the current economic situation in Montserrat. However, we make a suite of recommendations to allow future harvest of turtles to be carried out in a highly regulated and controlled manner, minimising its impact on the local nesting populations. We suggest programmes to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured future decreases in turtle stock. The fishing community should be involved in this process, and their interest in doing so was expressed as part of the TCOT SEQ results (see section 8.9). Furthermore, given that GoM will be responsible for the management of a future turtle fishery, it is vital that they have the skills, as well as the human, technical and financial resources to effectively monitor the fishery.

Regulation of use alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations to facilitate protection of critical marine turtle habitat in Montserrat.

3.3.5.1. Revise Turtle Ordinance Cap 112 1951

We recommend the following based on the draft revisions drawn up by the GoM as “the Turtle Act 2002” (not yet gazetted), but with additional changes:

- a) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.
- b) Ensure a closed season from the 1st of March to the 30th of November inclusive, to be reviewed every 5 years (to facilitate legislative adaptation to possible nesting season shift caused by climate change).
- c) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for all harvested turtle species that should be stipulated in any amended legislation.
- d) Consider a continued minimum size limit, as most fishermen already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for all harvested turtle species that should also be stipulated in any amended legislation.
- e) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers are required to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to the Government of Montserrat (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by Government of Montserrat. Quotas should be reactive and based,

inter alia, on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The Government of Montserrat should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level.*

- f) Ensure permanent and complete prohibition of all turtle capture methods except hand capture and use of turtle nets, with strict specifications for legal net structure and use.
- g) Ensure prohibition of the harvest of loggerhead and leatherback turtles.

***NB:** Any continuing turtle fishery must be accompanied by systematic monitoring regimes as described in section 8, along with a programme to monitor Catch per Unit Effort of licensed fishermen, and biometrics of turtle catch, which should also be implemented by the GoM.

3.3.5.2. Establish Marine Protected Areas

Montserrat does not currently have any marine protected areas. It is advised that, based on holistic assessment of the marine biodiversity of Montserrat, key areas be set aside for protection.

3.3.5.3. Consider Marine Turtles as part of Planning Policy and Beach Management

Montserrat's nesting marine turtles probably represent remnants of depleted populations and are at critically low levels (see section 8.5). However, the adverse impacts of increased beachfront development on the nesting populations using Montserrat's mainland beaches must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Montserrat, and therefore TCOT recommends the following policies:

- a) Ensure all development, other than non-permanent structures designed for daytime beach use, is 100m landward of the high tide mark.
- b) Introduce planning regulations to mitigate the adverse impacts of development on marine turtles, including, for example light pollution, nesting female disturbance and erosion.
- c) Ensure marine turtles are considered in the current beach sediment extraction projects being carried out in support of Montserrat's reconstruction.

3.3.5.4. Recommendations regarding Multilateral Environmental Agreements

- a) The Endangered Animals and Plants Ordinance, 1976, should be amended to prohibit commercial import and export of wild turtles and all wild turtle products of all marine turtle species, so that this legislation fully transposes CITES to domestic law.

- b) Given that Article III of CMS allows for harvests to accommodate the needs of subsistence users of marine turtles, the Government of Montserrat may have to consider the role of trade in subsistence economies, and limit commercial activities regarding the sale of turtle products.

3.3.6. Turks and Caicos Islands

The turtle fishery in the Turks and Caicos Islands incurs the largest legal take of marine turtles in the UK Overseas Territories in the Caribbean. From a biological perspective, the Fisheries Protection Ordinance 1998 does not facilitate the sustained management of TCI's nesting and foraging populations of marine turtles. TCOT recognises that a cessation of all turtle fishing in TCI would significantly contribute to the recovery of depleted populations. However, TCOT also recognises that turtle meat is a component of the traditional TCI diet, and that a demand for turtle meat remains amongst TCI's residents and visitors. TCOT SEQ suggests that foraging turtle populations may be either stable or increasing, which indicates that a ban on turtle fishing in TCI would not receive majority support and that such a ban would probably present significant enforcement problems. However, we recommend that future harvest of turtles must be carried out in a highly regulated and controlled manner, with legislation in place to permanently and strictly protect adult turtles, programmes established to monitor stock abundance, and mechanisms in place to reduce or close the fishery in response to measured decreases in turtle stock. It is important to note that the DECR must have the skills, as well as the human, technical and financial resources to effectively manage the fishery.

TCOT recommends a number of legislative changes required to increase the likelihood of sustainability of a turtle harvest in TCI. In addition, it is noted that the regulation of use alone will not serve the sustainable management of turtles in the Turks and Caicos Islands. TCOT therefore also makes recommendations regarding the promotion and publicising of the National Parks Ordinance 1998, which should protect critical marine turtle habitat (see section 9.1.4.2).

3.3.6.1. Amend harvest legislation:

TCOT recommends that the Fisheries Protection Ordinance, 1998 is amended to include the following provisions:

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for green and hawksbill turtles that should be stipulated in any amended legislation.
- b) Consider a continued minimum size limit, as most fishers already accept this as an established conservation

measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for green and hawksbill turtles that should also be stipulated in any amended legislation.

- c) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers are required to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to DECR (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by DECR. Quotas should be reactive and based, inter alia, on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The DECR should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level*.

***NB.** Any future turtle fishery must be accompanied by systematic monitoring regimes as described in section 9, along with a programme to monitor Catch per Unit Effort of licensed fishermen, and biometrics of turtle catch, which should also be implemented by the DECR.

- d) Establish a closed season (see NB below) to be reviewed every five years (to facilitate legislative adaptation to possible nesting season shift caused by climate change) to prevent capture of adult turtles entering TCI's waters to breed.

NB. Estimates of composite turtle nesting seasonality for green, hawksbill and loggerhead turtles in TCI, based on regional seasonalities, suggest that while turtle nets are still used in TCI, the ideal closed season would extend from the 1st of April to the 31st of January inclusive (see section 9.5.1). However, it is important to note that no evidence of loggerhead nesting has been recorded in TCI in the last 20 years. TCOT also acknowledges that almost all turtles currently caught in TCI are caught by hand, and the use of spearguns and Hawaiian slings is already prohibited. Therefore, if the suggested maximum size limits are introduced, and the use of turtle nets is prohibited as suggested below, then accidental, fatal capture of adult turtles entering TCI's waters to breed will be unlikely. Furthermore, the introduction of a 10 month closed season to the current fishery may present significant enforcement difficulties for the DECR. TCOT therefore suggests that a preliminary 6 month closed season from the 1st of July to December the 31st be considered, to encompass the majority of both the green and hawksbill turtle nesting seasons. This can be reviewed in the future when systematic rookery monitoring, as suggested below, reveals the actual composite turtle nesting season in TCI.

- e) Establish regulations with regard to the type of gear that can be used to capture turtles. Possible regulations could ensure permanent and complete prohibition of all turtle capture methods except hand capture (i.e. jumping turtles from a boat and in-water hand capture using only hands and lobster hook) as suggested by turtle fishers during TCOT SEQ.

- f) Ensure prohibition of the harvest of loggerhead and leatherback turtles given their very low numbers in TCI.

NB. It is important that all legislative changes are designed under the marine turtle conservation and management advisory process in consultation with the fishing community. Forty-two percent of the turtle fishers surveyed in the TCOT SEQ said that they thought fishers should be consulted when regulations are set.

3.3.6.2. Amend Planning Policy and Beach Management

Historical records suggest that marine turtle nesting populations in TCI have been subject to prolonged harvest and therefore, while trends in abundance of nesting turtles are unknown, these populations may represent remnants of depleted populations. However, the adverse impacts of increased beachfront development on the nesting populations using TCI mainland beaches must be considered, in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in TCI, and therefore TCOT recommends the following:

- a) Where possible, protected status should be extended to all nationally important nesting sites within TCI.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, nesting female disturbance and erosion on all other nesting beaches.
- c) Where the extension of protected status to identified nesting beaches is not possible, TCOT recommends that TCI Government ensures, as a matter of priority, that any development occurring adjacent to important turtle rookeries is undertaken sensitively under the planning regulations mentioned above, to mitigate disturbance and destruction of habitat.
- d) Under the guidance of the marine turtle conservation and management process, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings (e.g. property lighting regimes).

3.3.6.3. Recommendations regarding Multilateral Environmental Agreements

- a) CITES should be extended to TCI as soon as possible, and the appropriate domestic legislation drafted and gazetted, to address the possible trade of hawksbill scutes from TCI to neighbouring states.
- b) Given that Article III of CMS accommodates the needs of traditional subsistence users of marine turtles, the Government of TCI should consider the role of trade in the subsistence fishery economy of TCI, and limit commercial activities regarding the sale of turtle products.

NB. CITES does not currently extend to TCI and TCOT SEQ corroborates previous reports that suggest there is limited trade in hawksbill turtle shell between TCI, the Dominican Republic and possibly Haiti. TCOT SEQ also suggests that turtle meat may be occasionally and illegally smuggled into the USA via Miami.

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An Assessment of the Status and Exploitation of Marine Turtles in Anguilla





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

4. Status and Exploitation of Marine Turtles in Anguilla

Contents

	Page
4.1. Summary and Recommendations	40-44
4.2. Geographic Overview	44
4.3. Historical Overview	45
4.4. Organisations Involved with Marine Turtles in Anguilla	45-46
4.5. Status of Nesting Marine Turtles in Anguilla	46-54
4.5.1. Monitoring efforts and TCOT	47-51
4.5.1.1. Hawksbill and loggerhead turtles	47-48
4.5.1.2. Leatherback turtles	48-49
4.5.1.3. Green turtles	49
4.5.1.4. Mainland nesting beaches	49-50
4.5.1.5. Nesting on the cays and islands	50-51
4.5.2. Data from the TCOT SEQ	51-53
4.5.3. Genetics of nesting populations	53-54
4.6. Status of Foraging Marine Turtles in Anguilla	55-59
4.6.1. Monitoring efforts	56-57
4.6.1.1. Caribbean Turtlewatch – Anguilla	56
4.6.1.2. In-water sampling	56-57
4.6.2. Data from the TCOT SEQ	57-58
4.6.3. Genetics of foraging populations	58-59
4.7 Direct Use of Marine Turtles in Anguilla	60-71
4.7.1. Overview	60-62
4.7.2. Harvest of adults on the nesting beach	62-63
4.7.3. Harvest of eggs	63-65
4.7.4. Harvest at sea	65-66
4.7.5. Trade in turtle meat	66-68
4.7.5.1. Sale of meat by turtle fishers	66-67
4.7.5.2. Sale of turtle meat by direct vendors	67-68
4.7.5.3. Consumption of turtle meat	68
4.7.6. Trade in shells and shell products	68-70
4.7.6.1. Sale of shells and shell products by turtle fishers	69
4.7.6.2. Sale of shells and shell products by direct vendors	69-70
4.7.6.3. Consumption of turtle shell and shell products	70
4.7.7. Incidental catch in marine fisheries	70-71
4.8. Indirect Use	72-73
4.9. Attitudes to Conservation	73-75
4.10. Capacity Building and Outreach Activities During TCOT	75-76
4.10.1 Capacity building	75
4.10.2. Outreach activities	75-76
4.11. Acknowledgements	76
4.12. References	76-77

4.1. Summary and Recommendations

At least three species of marine turtle (leatherback, green and hawksbill turtles) nest in Anguilla, but in critically low numbers and much needs to be done to ensure the continued existence of the nesting populations and facilitate their recovery. Foraging marine turtles (generally green and hawksbill turtles) are widespread in Anguillian coastal waters and appear to be locally abundant at some sites (see table 4.1.).

Until 1995, there was a turtle fishery in Anguilla and, from information gathered through the TCOT Socio-Economic Questionnaire, it appears that thousands of green turtles and hundreds of hawksbill turtles were caught each year. The 5-year moratorium on turtle fishing introduced in 1995 was extended for a further 5 years in 2000. To date, there has been no consistent monitoring of marine turtle populations, but there is a general perception amongst the local population that the number of turtles in Anguillian waters is on the increase. By all accounts, direct exploitation has been drastically reduced by the moratorium with only occasional take for personal use.

Recommendations

TCOT recommends that the Government of Anguilla takes all necessary steps to ensure the sustained existence of nesting and foraging populations of marine turtles in Anguilla and to facilitate their recovery.

This will require actions under the following general headings:

4.1.1. Increase capacity for management of the marine environment including marine turtles

- 4.1.1.1. Increase the capacity of the Department of Fisheries and Marine Resources (DFMR).
- 4.1.1.2. Establish an advisory mechanism to support DFMR marine turtle work.

4.1.2. Amend legislation to facilitate marine turtle population recovery

- 4.1.2.1. Amend the Fisheries Protection Regulations.
- 4.1.2.2. Amend the Marine Parks Act.
- 4.1.2.3. Amend Planning Policy and Beach Protection Act.
- 4.1.2.4. Recommendations regarding Multilateral Agreements.

4.1.3. Establish systematic monitoring of marine ecosystems including turtle populations to determine trends in abundance

4.1.4. Establish further conservation and awareness programmes to make residents and visitors in Anguilla aware of marine turtle conservation requirements

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring,

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	Very small numbers	Adults and juveniles present Large numbers of juveniles in some areas	Low level of illegal harvest at sea Low levels of illegal egg harvest
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Moderate numbers, the most frequently encountered species nesting in Anguilla	Adults and juveniles present Large numbers of juveniles in some areas	Low level of illegal harvest at sea Low levels of illegal egg harvest
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Small numbers	Rarely encountered	No adult harvest reported since moratorium Low levels of illegal egg harvest
Loggerhead Turtle (<i>Caretta caretta</i>)	No reliable records of nesting	Adults and juveniles occasionally encountered	Unlikely

Table 4.1. Marine turtle species present and summary of exploitation in Anguilla.

research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific Recommendations

4.1.1. Increase Anguilla's capacity for management of the marine environment including marine turtles

TCOT has significantly contributed to the skills and technical knowledge of the Department of Fisheries and Marine Resources (DFMR) officers. However, their enforcement patrol, research and monitoring capacity is currently compromised due to a shortage of staff, equipment and a limited budget. It is essential that the DFMR receive adequate human and financial resources, as well as governmental support to effectively carry out their custodianship of Anguilla's highly valuable marine and coastal resources on which the country's economy so heavily depends.

To date there has been limited dedicated marine turtle research in Anguilla and no permanent decision-making process that involves all stakeholders. Marine turtle conservation and management in Anguilla is of significant public interest, particularly in fishing communities. It is essential that public compliance with marine turtle management measures continues and, to facilitate such compliance, it is necessary that stakeholders feel they have meaningful input into a decision-making process.

4.1.1.1. Increase the capacity of the Department of Fisheries and Marine Resources

- a) Ensure DFMR has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine resource management. This includes the ability to effectively collect, enter, manage and analyse data for turtle monitoring programmes.
- b) In order to make best use of available resources, ensure that every opportunity to carry out marine turtle research and monitoring in tandem with other essential fisheries research and monitoring is fully utilised.
- c) Ensure that all new Fisheries Officers and appropriate staff affiliated to the Marine Parks are adequately trained in marine turtle biology, as well as research and conservation techniques.

- d) Ensure that appropriate members of staff within DFMR and Marine Parks are given powers of arrest under the Fisheries Protection Act in order to ensure that they are able to enforce regulations.

4.1.1.2. Establish an advisory mechanism to support DFMR marine turtle work

Ensure that marine turtle management issues are included on the agenda of an appropriate national advisory committee, e.g. the National Environmental Advisory Committee (NEAC), or a stakeholder group established to implement the Environment Charter. This group would fulfil an important advisory role for the DFMR and could help maintain the momentum of future work, as well as bolstering the profile of marine turtle research and conservation at a high level within the government. Particular attention is required on issues surrounding the current moratorium, habitat protection, exploring possibilities for sourcing funding for further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation. The Advisory Committee should seek external advice from appropriate experts where necessary. Resources may be required to facilitate the participation of some stakeholders.

4.1.2. Amend legislation and policy to facilitate marine turtle population recovery

Amendments to environmental legislation and policy to facilitate the effective management and protection of marine resources in Anguilla, including turtles, should be given priority. TCOT acknowledges that recent successful bids by the Government of Anguilla for funding from the Foreign and Commonwealth Office Overseas Territories Environment Programme (OTEP) will facilitate vital amendments to environmental legislation including some of the recommendations below.

Prior to the Fisheries Protection (Amendment) Regulations, 1995, the legislation that regulated the harvest of marine turtles and their eggs in Anguilla did not facilitate the sustained management of the country's nesting and foraging populations of marine turtles. Indeed, the harvest may also have impacted nesting and foraging populations of turtles found elsewhere in the Wider Caribbean Region.

TCOT recognises that a complete ban on marine turtle fishing is an effective management option to facilitate rapid and lasting recovery of depleted turtle populations. However in Anguilla, despite a 9 year moratorium on turtle harvest, the data that would allow for a scientific assessment of the status of turtles and recommendations on future management options are only now beginning to be gathered.

TCOT recognises that turtle meat is a component of the traditional Anguillian diet and that turtle populations may recover to an extent that they could support a future limited sustainable harvest of green and hawksbill turtles. A requirement of any future harvest of turtles is that it is carried out in a regulated and controlled manner, with

programmes in place to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured decreases in turtle stock. If the DFMR are to be responsible for the management of a future turtle fishery, it is vital that they have the skills, and the human, technical and financial resources to effectively monitor the fishery. TCOT does not believe that this is currently the case and it is unlikely that the necessary structures could be put in place by the end of 2005. TCOT therefore believes that effective management and monitoring of a turtle fishery cannot currently be guaranteed.

Therefore, TCOT recommends replacing the moratorium on turtle fishing in Anguilla with a 3 year active and participatory research programme. For the duration of this research programme there should be no harvest of marine turtles in Anguillian waters. The programme should assess the viability of establishing a highly regulated experimental turtle fishery by 2009 and should be characterised by active involvement of fishers and open dialogue between all stakeholders. Capacity building to ensure that the DFMR will be equipped to effectively manage a turtle fishery, should it be established, should begin immediately.

While making this recommendation, TCOT would like to highlight and acknowledge that fishers appear to have been largely compliant with the moratorium since 1995. TCOT SEQ interviews indicate that fishers perceived that the aim of this temporary legislation was to facilitate turtle population recovery and allow the authorities to measure population recovery through monitoring. Inaction on the part of the relevant authorities on this matter means that it is not currently possible to ascertain whether the desired increase in the turtle population has occurred. In the absence of any long term, meaningful research, the fishers have repeatedly been asked to compromise and to date have been given no scientific justification for this compromise – hence the TCOT recommendation that fishers should be at the heart of future research. In order to facilitate fisher participation in this research, funding should immediately be sought to initiate the recommended research programme, which should include financial incentives for fisher participation.

In the event of a future marine turtle harvest in Anguilla, TCOT recommends that there are a number of legislative changes required to facilitate the sustainability of such a harvest. In addition, Anguilla's turtles face a host of threats imposed by the growing human population (2004 estimate: 1.98%, www.cia.gov) and the rapid growth of tourism. The regulation of use alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations regarding legislation changes to facilitate protection of critical marine turtle habitat in Anguilla.

4.1.2.1. Amend the Fisheries Protection Regulations

a) Short to medium term

- i. The Advisory Committee described above should immediately start to seek funding for a participatory

marine turtle research programme and solicit the participation of interested fishers in the in-water and nesting beach monitoring and sampling regimes described below.

- ii. Change the current penalty for contravening the moratorium under the Fisheries Protection regulations to a more appropriate penalty, in line with other offences under the Act (e.g. fine of EC\$5,000 and/or imprisonment for up to 12 months).

b) Long-term

Once abundance trends of green and hawksbill turtles have been established through the programmes described below, and if they are deemed favourable to reopen a turtle harvest, amend the Fisheries Protection Regulations as follows:

- i. Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.
- ii. Ensure a closed season that protects breeding turtles in Anguillian waters from the 1st of April to the 30th of November inclusive, to be reviewed every 5 years (in order to react to possible shifts in nesting seasons due to climate change).
- iii. Ensure the permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for green and hawksbill turtles that should be stipulated in any amended legislation.
- iv. Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for green and hawksbill turtles that should also be stipulated in any amended legislation.
- v. Establish a limited licensing scheme for turtle fishing whereby turtle fishing is restricted to licensed individual fishers who are required to abide by strict regulations regarding fishing practice. Harvest quotas should be adaptive and based, inter alia, on the number of licensed turtle fishers and stock assessments established through the monitoring regimes*.
- vi. Establish regulations with regard to the type of gear that can be used to capture turtles. Possible regulations could ensure permanent and complete prohibition of all turtle capture methods excluding hand capture and use of turtle nets, with strict specifications for legal net structure and use.
- vii. Ensure prohibition of the harvest of loggerhead and leatherback turtles in Anguillian waters. The Government of Anguilla have also expressed that they would recommend prohibition of any future take of hawksbill turtles.

NB. Any future turtle fishery must be accompanied by systematic monitoring regimes as described below, along with a programme to monitor Catch per Unit Effort of licensed fishers, and biometrics of turtle catch, which should also be implemented by the DFMR. In the event of the reopening of Anguilla's turtle fishery, the Fisheries Protection Act must be further revised to provide statutory powers to react to the ongoing results of the abundance trend monitoring programmes. In the event of declining abundance trends or declining Catch per Unit Effort below pre-established thresholds, the DFMR must have the power to temporarily or permanently close the turtle fishery.

4.1.2.2. Amend the Marine Parks Act

Anguilla's Marine Parks provide important habitat for foraging populations of juvenile and sub-adult green and hawksbill turtles. Island Harbour and Little Bay support relatively large numbers of green turtles, whereas hawksbills are encountered in all the Marine Parks. In order to facilitate turtle population recovery, it is important that these areas are free of disturbance and take by turtle fishers under any future harvest regime. To facilitate this, Management Plans should be drafted for all marine parks to ensure the effective implementation and enforcement of Marine Parks Regulations and the Marine Parks Act should be amended to:

- a) Ensure that all 5 'designated' marine parks are fully described in Schedule 1 of the Marine Parks Regulations.
- b) Ensure that marine turtles have permanent and complete protection within Anguilla's Marine Parks. This should include no take zones as well as policies to curb potential negative tourism impacts e.g. through SCUBA diving and snorkelling.

4.1.2.3. Amend Planning Policy and Beach Protection Act

Anguilla's nesting marine turtles are at critically low levels. The adverse impacts of increased beachfront development on the nesting populations using Anguilla's mainland beaches must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Anguilla, and therefore TCOT recommends the following legislative and policy changes:

- a) Revise the Planning Department's proposed Land Use Plan (1996) so that Captain's Bay and Savannah Bay and all land at least 100m landward of the high tide marks of these Bays are protected from the adverse impacts of development. E.g. by being re-designated as Conservation Areas.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, disturbance of nesting females and erosion on all other nesting beaches.

c) Ensure that all developments that impact on marine turtle nesting or foraging habitat are required to undertake an environmental assessment that includes an evaluation of impacts and measures to mitigate negative impacts.

d) Amend the Beach Protection Act (2000) in order to prohibit all sand mining at Windward Point (and any other turtle nesting beach), thereby allowing natural sand accretion and beach rehabilitation for marine turtle nesting.

e) Under the guidance of the advisory committee (see 4.1.1.2), develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings and distribute recently produced National Trust advisory leaflet to all hotels to advise on mitigating against light pollution.

4.1.2.4 Recommendations regarding Multilateral Environmental Agreements

Gazette legislation to transpose CITES to domestic law.

4.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

Anguilla hosts nesting populations of green, hawksbill and leatherback turtles, and foraging populations of green and hawksbill turtles with occasional loggerhead turtles also reported. TCOT SEQ revealed a general public perception that the numbers of turtles foraging in Anguilla's waters and nesting on the beaches has increased in recent years due to the moratorium, but perceptions were that nesting and foraging populations had declined in living memory.

Anguilla's nesting turtle populations are at critically low levels, and while Dog Island and Scrub Island may host nationally or even regionally significant populations of all three species, levels of nesting on these islands remain unknown. The foraging populations may be in the process of recovery, but trends in abundance will only be determined by long-term systematic monitoring. In order to understand the conservation status of these populations and inform effective conservation management, it is vital to work towards establishing data that will reveal any trends in their abundance. TCOT therefore recommends that the following monitoring programmes be established, under the guidance of the advisory committee (see 4.1.1.2), as a matter of priority:

4.1.3.1. Establish systematic monitoring efforts at mainland index nesting beaches, as well as Dog and Scrub Islands

- a) Establish a sustainable programme of weekly morning nesting beach monitoring at index beaches on mainland Anguilla (e.g. Blackgarden Bay, Captain's Bay, Savannah Bay) and at least monthly monitoring on Dog and Scrub Islands to determine nesting abundance and to facilitate genetic analysis of the nesting population through nest excavation and sampling.

NB. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the advisory committee, into seasonal, revenue generating turtle walks for tourists in order to raise funds to contribute to marine turtle management efforts.

- b) Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes at Island Harbour and other identified green turtle foraging sites (nets & CPUE), and on the stretch of coast from Little Bay to Sandy Ground and other identified and accessible hawksbill turtle foraging sites (snorkel surveys) to determine abundance trends.
- c) Establish a regular and frequent (quarterly) genetic sampling regime at Island Harbour (nets), Scrub Island (nets), Shoal Bay (hand capture) and Little Bay/ Sandy Ground (hand capture) to increase understanding of genetic stock composition of green and hawksbill turtle populations.

NB. Steps should be taken to encourage the involvement of interested local fishers in all monitoring programmes (e.g. CPUE monitoring in Island Harbour and elsewhere), and financial incentives should be considered.

4.1.4. Establish further conservation and awareness programmes to make residents and visitors to Anguilla aware of marine turtle conservation requirements

Increased awareness of turtles and their conservation requirements in Anguilla can provide short and long-term mitigation against the threats faced by marine turtles. TCOT recommends the following actions, to be implemented under the guidance of the advisory committee, to encourage a public contribution to marine turtle conservation and raise general awareness about these species:

4.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to observe hatchling emergencies.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure DFMR has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to sensitise Anguillians to the importance of protecting the nests of such small nesting populations and to encourage reporting of any illegal take of eggs or nesting females.

- d) Develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings, and distribute the recently produced National Trust advisory leaflet to all hotels to advise on mitigating against light pollution.
- e) Ensure school participation in rookery monitoring programmes to sensitise children to importance of rookery protection

4.1.4.2 Implement general awareness programmes regarding marine turtle conservation in Anguilla

- a) Develop the Anguilla National Trust turtle specific educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.
- b) Raise awareness among Anguillians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.
- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.
- e) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.

4.2. Geographic overview

Anguilla is a low-lying coralline limestone island, of about 91 sq km, situated at the northern end of the Leeward island chain in the Eastern Caribbean at 18°N 63°W (FCO 1999; Proctor & Fleming 1999). The estimated population is 13,008 (www.cia.gov 2004). It is comprised of one inhabited island and 8 small uninhabited islands and cays, including Dog Island, Prickly Pear Cays, Scrub Island, and Sombrero Island 61km to the northwest. Sea depths are 23m to 45m within 1km of the shore (Gell & Watson 2000). The Anguillian economy depends heavily on tourism (31% of revenue) with a very high standard of hotels. Traditional industries, such as boat building, fishing, farming, salt production and livestock rearing have, in recent years, been overshadowed. Though the island has limited natural resources, it does have about 35 sandy beaches and one of the most important largely unbroken coral reefs in the Eastern Caribbean (FCO 1999; Gell & Watson 2000). Its coastal and marine biodiversity is probably its most important natural asset.

4.3. Historical Overview

Anguilla preserves a rich archaeological record reflecting nearly 4000 years of human habitation. Studies of Amerindian settlement sites on the island have revealed a very strong reliance on sea-foods including fish, shellfish and turtles for at least the last 1,000 years (Peterson & Crock 2001). Peterson and Crock point out that organic materials like bones and scutes will not always survive archaeologically, so it is possible that turtles have been used for as long as the island has been inhabited. No Amerindians remained in Anguilla by the time of colonisation in the 1650s (Peterson & Crock 2001). Although turtle meat and eggs are notably absent from the only accounts of the diet in Anguilla from the 17th Century and until the early 20th Century (Jones 1976; Petty 1993), anecdotal accounts suggest that turtles have long been part of Anguilla's food culture (Connor & Connor 1998).

4.4. Organisations Involved with Marine Turtles in Anguilla

4.4.1. Department of Fisheries and Marine Resources (DFMR)

The DFMR was established in 1991 in recognition of the need to place more emphasis on the fishing industry and the marine environment. The department currently has 6 members of staff. In addition to the Acting Director, there is a Marine Biologist, a Senior Clerical Officer, 2 Fisheries Officers and a Casual Worker. The DFMR has an extensive remit and is responsible for the development and management of Fisheries and Marine Parks and all Coastal Zone Management. Though the department has made significant progress in a relatively short period of time, the shortage of human resources at the Department and a limited budget continue to limit productivity at present (Gumbs 2003). DFMR is responsible for enforcing fisheries legislation in Anguilla's Exclusive Fisheries Zone (EFZ) of approximately 85,500km², which includes an extension of 200 miles to the north into open ocean, but sea patrols have recently been curtailed due to budget constraints and staff shortages (Gell & Watson 2000; Gumbs 2003). The Department is equipped with 3 boats, a 30' vessel with 2 x 200hp engines, a 15' whaler with a 45hp engine and a 6' dinghy with a 6hp engine, with the engine on the whaler 'in a state of disrepair' (Gumbs 2003). Furthermore, no-one in the department currently has powers of arrest as the head of department is working in the capacity of Acting-Director only (O. Vanterpool (DFMR) pers. comm. 2004).

The DFMR has been central to achieving the goals of TCOT over the last 3 years. DFMR staff have been involved in every aspect of TCOT work including nesting beach and foraging site surveys, nest excavations, in-water sampling, identification of a target audience for the TCOT Socio-economic Questionnaire and administration of questionnaires. Management and staff have prioritised TCOT work and enthusiastically supported fieldwork during TCOT field visits. Some rookery monitoring and in-water sampling was also carried out between field visits.



Figure 4.1. Map of Anguilla

4.4.2. Anguilla National Trust (ANT)

The Trust is currently experiencing major staff changes, with the Associate Executive Director having left for a government post in 2003, the Chief Executive leaving office in 2004 and a Biodiversity Officer post currently pending. The Trust led all marine turtle research and education efforts in Anguilla in advance of TCOT. They have carried out sporadic nesting beach monitoring and some socio-economic surveys regarding historical turtle fishing (Connor & Connor 1998). With funding from the United Nations Development Programme, the Trust has recently produced an 'Anguilla Sea Turtle Educator's Guide' and with funding from the FCO published 'The Reptiles and Amphibians of Anguilla, British West Indies'. In 1997, Karim Hodge of the ANT and Ms Chantal Lewis, formerly of Albenha Lake Hodge Comprehensive School, attended the Jumby Bay Hawksbill Training Workshop in Antigua. The workshop was aimed at equipping participants with the necessary and most useful skills in sea turtle conservation work. Anguilla has received technical assistance from the Wider Caribbean Sea Turtle Network (WIDECAST) and the Bellairs Research Institute in Barbados. With WIDECAST, it is currently preparing a *Sea Turtle Recovery Action Plan (STRAP)* for Anguilla (K. Hodge (Government of Anguilla) pers. comm. 2002). National Trust staff regularly attend regional WIDECAST meetings and international turtle symposia.

While the DFMR has provided technical, informational and practical support to TCOT staff during field visits, the Trust has provided essential advice, input and logistical support for the duration of the project. The Trust also provided essential ground support during the development and implementation of the Socio-economic Questionnaire.

Recommendations

4.1.1.1. Increase the capacity of the Department of Fisheries and Marine Resources

a) *Ensure DFMR has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine resource management. This includes the ability to effectively collect, enter, manage and analyse data for turtle monitoring programmes.*

b) *In order to make best use of available resources, ensure that every opportunity to carry out marine turtle research and monitoring in tandem with other essential fisheries research and monitoring is fully utilised.*

c) *Ensure that all new Fisheries Officers and appropriate staff affiliated to the Marine Parks are adequately trained in marine turtle biology, as well as research and conservation techniques.*

d) *Ensure that appropriate members of staff within DFMR and Marine Parks are given powers of arrest under the Fisheries Protection Act in order to ensure that they are able to enforce regulations.*

4.1.1.2. Establish an advisory mechanism to support DFMR marine turtle work

Ensure that marine turtle management issues are included on the agenda of an appropriate national advisory committee e.g. the National Environmental Advisory Committee (NEAC) or a stakeholder group established to implement the Environment Charter. This group would fulfil an important advisory role for the DFMR and could help maintain the momentum of future work, as well as bolstering the profile of marine turtle research and conservation at a high level within the government. Particular attention is required on issues surrounding the current moratorium, habitat protection, exploring possibilities for sourcing funding for further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation. The Advisory Committee should seek external advice from appropriate experts where necessary. Resources may be required to facilitate the participation of some stakeholders.

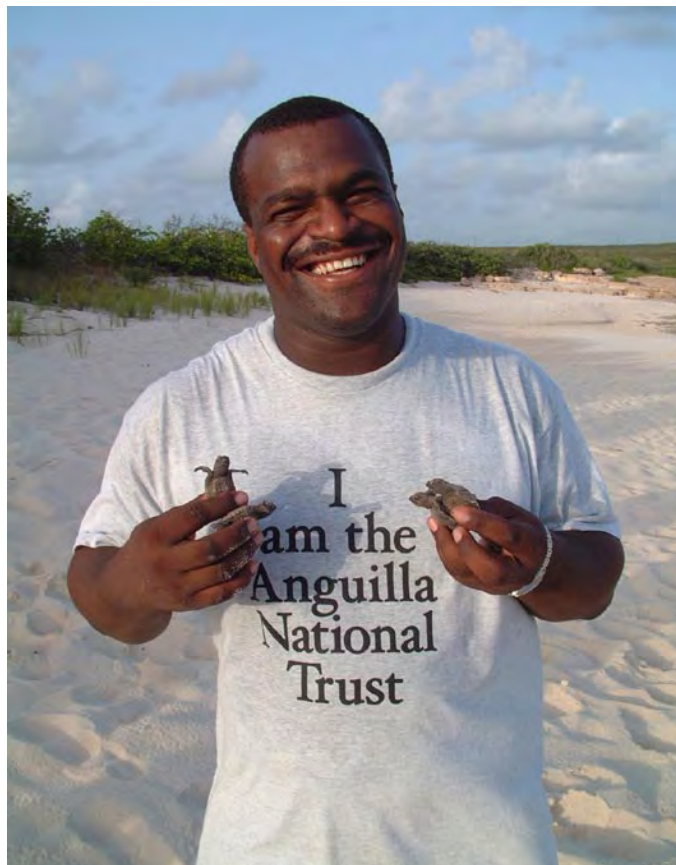


Photo 4.1. Karim Hodge, formerly of the Anguilla National Trust with hawksbill hatchlings at Captain's Bay (Photo: P. Richardson).

4.5. Status of Marine Turtle Nesting in Anguilla

The numerous short wide sandy beaches of Anguilla are potentially good nesting sites for turtles, but recent monitoring efforts by the Anguilla National Trust and a student of the University of East Anglia concur with observations made by Meylan in the early 1980s that suggest a low level of nesting on the island (Connor & Connor 1998; Meylan 1983). There are no quantitative data in the literature to give an indication of historical nesting levels and it is therefore impossible to state with any confidence how current nesting compares to past levels. It is possible that Anguilla's nesting populations represent remnants of larger populations.

Hawksbill turtles are believed to be the most abundant species nesting in Anguilla, with smaller numbers of leatherbacks and green turtle nests, and no reliable reports of loggerhead nesting (Meylan 1983). Meylan states that hawksbills nest most frequently on Dog Island, with some nesting on Prickly Pear Cays and also on the mainland. Green turtles are also reported to nest on the smaller islands and cays (Proctor & Fleming 1999; Richardson & Gumbs 1983). Local lore suggests that green turtles do not nest in Anguilla, but migrate to Aves Island, west of Guadeloupe to nest (Meylan 1983). During the TCOT SEQ, a number of the local fishers indicated that they believe that green turtles lay their eggs at sea where they float on the surface of the water until they hatch.

4.5.1. Monitoring efforts and TCOT

Sporadic monitoring of nesting beaches on mainland Anguilla has occurred since 1998 (see Table 4.2), when the Anguilla National Trust's *Anguilla Turtle Project* monitored 17 beaches from April to November (Connor & Connor 1998). Further monitoring was carried out on at least 8 beaches in 2000 (carried out by Connor & Connor for an unspecified monitoring period), and 19 beaches were monitored by a volunteer from the USA from 5th April to the 22nd September 2001 (K. Hodge (Government of Anguilla) pers. comm. 2003). No systematic nesting data was collected during 2002 and from 17th June to the 12th September 2003, Marianne Fish, a PhD student from the University of East Anglia, monitored 20 beaches on mainland Anguilla for TCOT on a voluntary basis while carrying out her PhD fieldwork. These surveys used varying identification techniques, employed different effort regimes and were carried out for varying periods throughout the year. The robustness of these data is therefore difficult to ascertain, but when taken at face value, they provide preliminary indications of turtle nesting patterns on mainland Anguilla.

Given what is known about nesting seasons for these species in this region (see 4.5.1.1), the 2001 survey, which recorded the highest number of green (n=8) and leatherback (n=33) turtle nests covered approximately 80% (4 out of 5 months) of the likely leatherback nesting season in Anguilla, and approximately 70% (5 out of 7 months) of the green turtle nesting season. The 2003 survey recorded the highest number of hawksbill nests (n=39) and covered approximately 40% (3 out of 7 months) of the nesting season.

It is highly likely that some nests were laid outside survey periods and it is impossible to estimate how many actual nests these surveys did not record, but because the 2001 and 2003 surveys covered the likely peak nesting seasons for the 3 species it may be that only a relatively small number of nests went unrecorded. However, the most that

can be surmised from the available data is that marine turtle nesting in Anguilla is at critically low levels and in order to facilitate population growth, adult turtles, nesting females and their eggs must be given full protection by Anguilla's legislation.

4.5.1.1. Hawksbill and loggerhead turtles

While hawksbills seem to be the most common nesters in Anguilla, it is important to note that even experienced turtle researchers find it difficult to distinguish hawksbill and loggerhead turtle tracks (Schroeder & Murphy 1999) and that hawksbill nests are often difficult to detect, as hawksbills prefer to nest above the vegetation line and will often nest on narrow, low-energy beaches (Pritchard & Mortimer 1999). However, the TCOT SEQ revealed that less than 10% (n=7) of interviewees believed that loggerheads nest in Anguilla, with only one fisherman claiming to have actually seen a loggerhead nest on Prickly Pear Cay. This is the only report of a loggerhead nest on record in Anguilla. Despite the inevitable confusion between hawksbill and loggerhead nests, it is therefore likely that loggerheads rarely, if ever, nest in Anguilla and that most hawksbill nests recorded during monitoring have been correctly identified. However, it is possible that some hawksbill nests may have been missed during these surveys and that hawksbill nesting has been under-reported. Given the number of nests recorded in these studies, and despite this species being the most numerous nester in Anguilla, Table 4.2 suggests that the mainland hawksbill nesting population is critically low.

Figure 4.2 shows that the most important beaches for hawksbill turtles are, in order of importance, Captain's Bay, Windward Point, Savannah Bay, Limestone Bay and Blackgarden Bay, with occasional nesting occurring on 9 other beaches. Figure 4.3 shows the seasonality of nesting indicated by the 2001 and 2003 data for hawksbill turtles. Hawksbill nesting appears to commence in June, peak in August/ September and tail off by the end of September. This is in general concordance with regional seasonality

Year and Surveyors	Survey Period	Survey Area	Number of nests recorded per year			
			Green	Hawksbill	Leatherback	Unidentified
1998 (R. Connor & J. Connor)	April-November (8 months)	17 mainland beaches	0	17	12	0
2000 (R. Connor & J. Connor)	Unspecified	8 mainland beaches	6	25	13	0
2001 (P. McShane)	5 April-22 September (5 ½ months)	19 mainland beaches	8	18	33	0
2003 (M. Fish)	17 June – 12 September (3 months)	20 mainland beaches	2	39	8	10

Table 4.2. Summary of nesting beach monitoring effort in Anguilla between 1998 and 2003 with number of nests recorded on mainland beaches for each species and each survey year.

(Richardson *et al.* 1999; Starbird *et al.* 1999), although at Buck Island, USVI, nesting occurs year round with peak nesting between May and November. Low-level nesting may occur year round in Anguilla, but this will not necessarily have been recorded in any of the existing datasets due to the limited survey periods.

4.5.1.2. Leatherback turtles

In May 2004, TCOT staff tagged a nesting leatherback on Maunday's Bay, that already bore one flipper tag that had been attached by the Fish and Wildlife Service while it nested on Culebra in 2001 (H. Horta (FWS, Puerto Rico) pers. comm. 2004). Nesting leatherbacks do not always show strong nest site fidelity (Plotkin 2003) and individual females have been recorded nesting on different islands within the Puerto Rico (including Culebra and Vieques), British Virgin Islands, USVI and Anguilla island complex, either within one nesting season or in subsequent seasons (Boulon *et al.* 1996; Eckert *et al.* 1989; Hastings 2003). The leatherbacks nesting in Anguilla are therefore likely to belong to the same genetically distinct population that also nests in BVI, USVI, and Puerto Rico (Dutton *et al.* 2003).

It is currently impossible to ascertain trends in nesting leatherback abundance in Anguilla given the historical lack of systematic rookery monitoring (Eckert 2001). However, monitoring in USVI, BVI and Puerto Rico suggests that nesting leatherback populations are increasing (Boulon *et al.* 1996; Eckert 2001; Hastings 2003). Trends are particularly encouraging in Tortola, BVI, where nesting has increased from 3 recorded nests in 1990, to 63 recorded nests in 2001 (Hastings 2003). It is possible that Anguilla's leatherback population is also showing (unrecorded) signs of recovery. Although turtle eggs, including leatherback eggs, were regularly taken and leatherback meat was consumed in Anguilla before the moratorium, and this seems to have been curtailed by the legislation, any recovery of nesting in Anguilla is more likely to be due to improved more long-term protection of nesting females in Puerto Rico and the US Virgin Islands in the last few decades.



Photo 4.2. Leatherback turtle nesting on Maundays Bay, May 2004 (Photo P. Richardson).

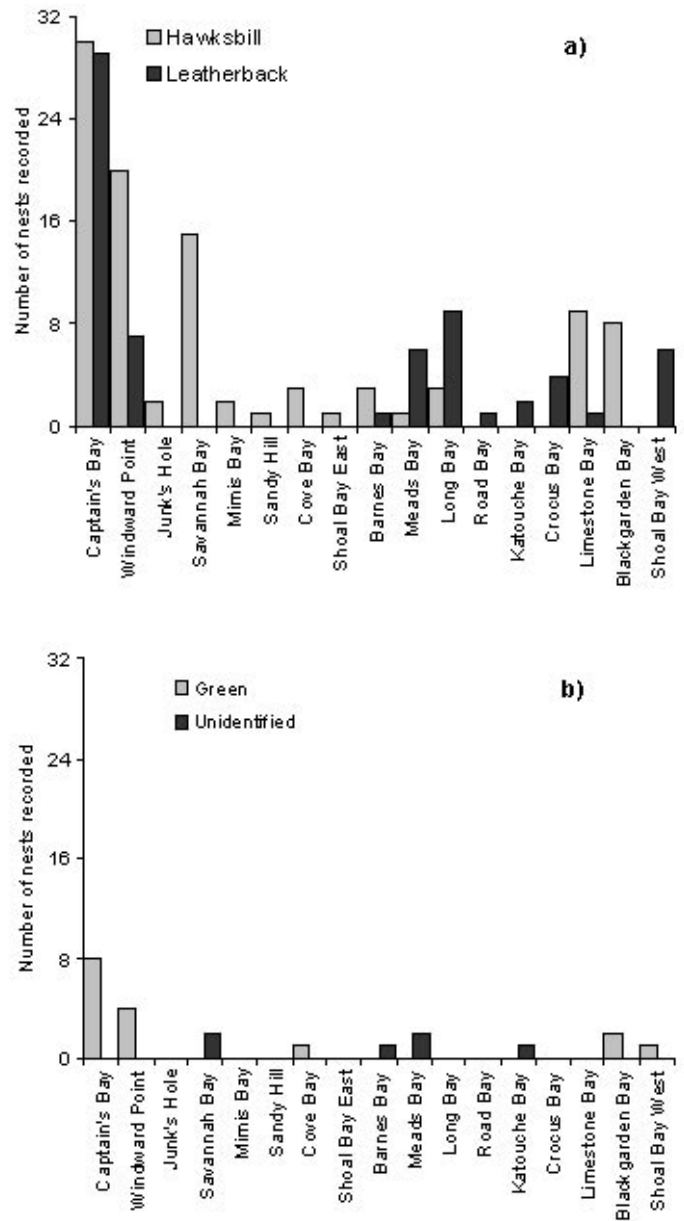


Figure 4.2. a) Distribution of leatherback and hawksbill turtle nesting on all mainland beaches monitored in 1998, 2000, 2001 and 2003. b) Distribution of green turtle nesting and nests where the species was unidentified on all mainland beaches monitored in 1998, 2000, 2001 and 2003. NOTE: Beaches listed clockwise from Captain's Bay in the north-east.

Leatherback nesting was definitely under-reported in 2003, because monitoring efforts did not start until mid-June, when leatherback hatchlings were beginning to emerge. Based on known average incubation periods of approximately 63 days for the region (Boulon *et al.* 1996), these emerging nests would have been laid in early to mid-April, concurring with the findings of the 2001 survey when the first leatherback nest recorded occurred on the 5th April. During the first TCOT field trip to Anguilla in 2002, TCOT staff recorded a fresh leatherback nest on Captain's Bay on the 15th of March. The known leatherback nesting season on mainland Anguilla extends from mid-March to early July, which is in accordance with regional seasonality recorded in USVI and BVI (Boulon *et al.* 1996; Hastings 2003).

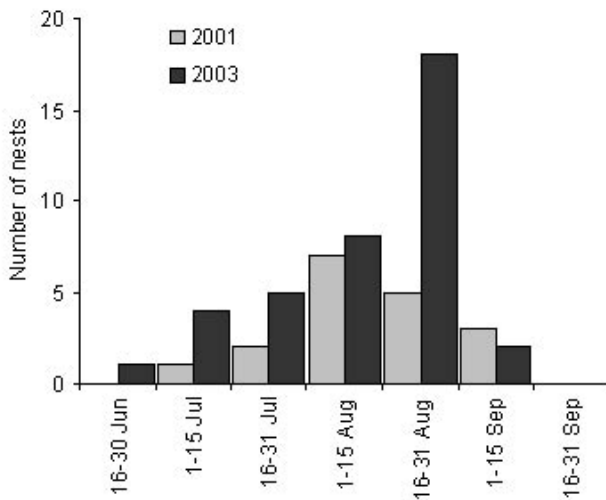


Figure 4.3. Seasonality of hawksbill nesting activity recorded during 2001 and 2003 survey periods.

The 2001 survey probably represented the most consistent and comprehensive effort during the leatherback season and this is probably why more leatherback nests were recorded than any other year. However, table 4.2 suggests that the leatherback nesting population is critically low and this is confounded by the likelihood that this population is shared with Puerto Rico, USVI and BVI. It is likely that the leatherbacks nesting in Anguilla represent a depleted population as in BVI (Hastings 2003). Indeed, one TCOT SEQ interviewee recalled a night in early 1982 when he visited Mead's Bay. At the time, this beach was completely undeveloped, and the interviewee claims to have seen about 18 leatherback turtles nesting on one night. He also reported that the following morning Anguillians were on the beach excavating the nests for eggs. This is the only record of such nesting in Anguilla, but introduces the possibility that as in BVI, the leatherback nesting population was once far more numerous.

Figure 4.2 shows that the most important mainland beach for leatherbacks is Captain's Bay, with between 6 and 9 nests having been recorded at Long Bay, Windward Point, Meads Bay and Shoal Bay West during the survey periods. Occasional leatherback nests were also recorded on 5 other beaches during surveys between 1998 and 2003. TCOT staff recorded leatherback nests on Maunday's Bay and Rendezvous Bay in April and May 2004.

4.5.1.3. Green turtles

Table 4.2 suggests that there are very low numbers of green turtle nests on Anguilla. Nesting appears to be limited to August and September. These nests were laid in later stages of the regional nesting season, which occurs from about May to November, generally peaking in July and August (Hirth 1997). Figure 4.2 shows that Captain's Bay has been the most frequently used mainland beach for green turtles during the survey period, with nests occasionally reported on 4 other beaches.

4.5.1.4. Mainland nesting beaches

Figure 4.4 shows the combined numbers of recorded nests on all beaches monitored during 1998, 2000, 2001 and 2003. Clearly, Captain's Bay is the most important mainland beach, with 67 nests recorded during the surveys, whereas Windward Point hosted 31 nests and Savannah Bay hosted 17 nests. Long Bay, Blackgarden Bay and Limestone Bay all hosted 10 or more nests during the surveys. It is worth noting that all of these beaches have little or no development immediately behind them.

However, Captain's Bay has a large, US-owned and well-lit (e.g. security lights and decorative lights shining onto the beach) housing development (including a floodlit tennis court) overlooking the beach to the eastern end (Photo 4.3). Windward Point is heavily mined for sand (Photo 4.4) and construction started on a locally-owned bar/disco (Photo 4.5) immediately behind Limestone Bay in late 2003, involving the removal of much beach vegetation. If this development is successful, it will undoubtedly cause some disturbance to nesting female turtles through light and noise pollution, as well as increased night-time use of the beach by the customers. Sand mining on Windward Point has effectively removed nearly all of the dry sand used by nesting turtles at the back of the beach, and has exposed the water table, thus forming saline puddles where nesting may once have occurred. Blackgarden Bay has one expatriate residence immediately adjacent to the beach and Savannah Bay is largely undeveloped, but it is known to have been used for beach driving with quad bikes and four wheel drives. This activity has the potential to destroy nests and hatchlings on the beach (Photo 4.6).

While few nests were recorded at Windward Point in 2003, 5 false crawls were recorded. In September 2002, TCOT staff recorded 1 or 2 false crawls on Windward Point, where the turtle(s) had crawled extensively over the beach, even crawling through the saline puddles at the back of the

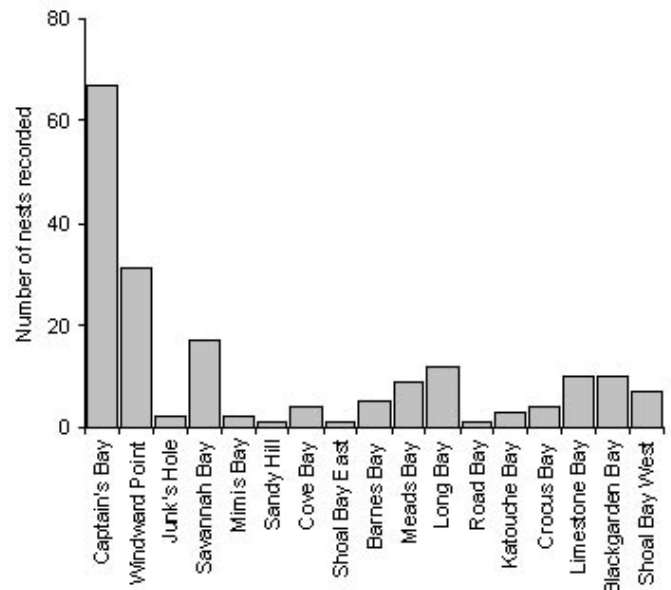


Figure 4.4. Combined numbers of recorded nests for all species on all beaches monitored during 1998, 2000, 2001 and 2003. NOTE: Beaches listed clockwise from Captain's Bay in the north-east



Photo 4.3. Captains Bay showing recent housing development (Photo S Ranger).

beach where the sand has been mined down to the water table (Photo 4.7). Windward Point and Captain's Bay are amongst 18 beaches listed as Protected Beaches under the Beach Protection Act, (2000), which prohibits sand mining within 200 feet of the foreshore.

The Government of Anguilla Planning Department's proposed Land-Use Plan (GOA, 1996) currently designates Windward Point, Long Bay, Limestone Bay and Blackgarden Bay as 'Conservation Areas'. Savannah Bay lies within a 'Tourism Development Area' and Captain's Bay lies within a 'Resort/Residential Area'. Beachfront development has various adverse impacts on turtle nesting, including erosion, light pollution, disturbance of nesting females and increased egg/hatchling predation by domestic, feral or vermin species (Witherington 1999). Most of these potential impacts have not been investigated in Anguilla, but there is growing concern about erosion caused by uninformed beachfront development practices at various beaches around the island (Proctor & Hodge 1997). In 2003, the ANT produced a leaflet entitled *Help us grow, stop the glow* designed to inform hoteliers and other beach front property owners about the impacts of lighting on nesting turtles and



Photo 4.4. The effects of sand mining at Windward Point (Photo S. Ranger).

hatchlings (Appendix 4.1). The most undeveloped beaches on the main island are in the east. There have been some tourism development proposals for this area e.g. a golf course in the Junks Hole bay area. The whole of the eastern tip of the island is designated for development, but according to the Tourist Board, the current Tourist Board strategy for development does speak strongly to environmental considerations and EIAs for developments would have to address potential impacts on marine turtle habitat (C. Niles (Anguilla Tourist Board) pers. comm. 2002).

4.5.1.5. Nesting on the cays and islands

To date there has been no systematic monitoring of any of the cays, Scrub or Dog Island, despite reports that beaches on Dog Island and Prickly Pear Cays are the most important hawksbill rookeries of Anguilla and that Scrub Island may host a nationally significant leatherback rookery (Meylan 1983; Richardson & Gumbs 1983). During the TCOT SEQ, 8 (11.1%) interviewees specifically stated that Dog Island was an important nesting site in Anguilla, with some fishers claiming that they have seen many turtle tracks there during recent summers. Marianne Fish recorded 5 possible hawksbill nests on a beach on Dog Island during a field trip



Photo 4.5. Limestone Bay being developed, May 2004 (Photo P. Richardson).



Photo 4.6. Car tracks on Savannah Bay (Photo P. Richardson).



Photo 4.7. Attempted nesting at Windward Point (Photo S. Ranger).

on the 15th August 2003 (M. Fish, (UEA) pers. comm. 2003). Seven (9.7%) of interviewees stated that turtles nest on Scrub Island, and an Island Harbour resident who regularly takes tourists to Scrub Island reported that hundreds of turtles, both green and hawksbill, nest on Scrub Island each year (J. Lake, pers. comm. 2002). Meaningful monitoring of the cays and islands was not achieved during TCOT due to logistical constraints.

TCOT staff visited Dog Island and Prickly Pear Cays in March 2002 (outside the nesting season) when no evidence of nesting activity was recorded (Photo 4.8). However, during a one-night field visit to Scrub Island in September 2002, TCOT staff recorded at least 17 tracks on Deadman's Bay. All appeared to be hawksbill nests that had been deposited in the previous week. Hatchling tracks from an older hawksbill nest were also observed. In addition there were 7 large, older body pits close to the vegetation line, thought to be nests deposited earlier in the season, possibly by green turtles due to their size and position on the beach (Photo 4.9). The approach to Deadman's Bay is almost completely blocked by an inshore fringing reef possibly ruling out leatherback nesting. On a field trip to Scrub Island in March 2002, approximately 5 large, old body pits were recorded on Deadman's Bay and on the same trip, 3 large body pits that may also have been green turtle nests were recorded on the beach adjacent to the disused airstrip.

Scrub Island and Dog Island potentially host nationally or even regionally significant rookeries for hawksbill, green and leatherback turtles. Both these islands are privately owned, and Scrub Island has been on the market for a number of years. TCOT staff interviewed the owners of both islands, who gave the impression that there is a possibility for development on the islands, but not in the immediate future. It is vital to establish the importance of any rookeries located on the outlying cays as a priority.

4.5.2. Data from the TCOT SEQ

Perceived nesting trends: As part of the TCOT SEQ, all 72 questionnaire respondents were asked about perceived changes in nesting numbers over time (in the last 5 years and in living memory), both in general and for specific species. Thirty-eight respondents (53%) reported that they had noticed changes while 33 (46%) did not, and 1 did not answer the questions. A summary of these general perceptions of trends in turtle nesting is shown in Table 4.3.

Of the 38 respondents who reported to have noticed a change in nesting, 16 (42.1%) said they had noticed an increase in general turtle nesting in the last 5 years, while



Photo 4.8. Great Bay, Dog Island (Photo S. Ranger).



Photo 4.9. Old nest pit on Scrub Island (Photo P. Richardson).



Photo 4.10. Beach on Prickly Pear Cay East (Photo S. Ranger).

4 (10.5%) reported a decrease and 2 thought that levels of nesting had remained the same. The small number of respondents who had noticed species-specific changes for green, hawksbill and leatherback turtles reiterated the perception that numbers had increased in the last 5 years.

In contrast, 16 (42.1%) of the respondents who had noticed a change in nesting since they could remember said they had noticed a decrease in nesting generally, while 7 (18.4%) reported an increase, and 2 suggested that nesting had remained the same. Once again, this general perception that nesting had decreased in living memory was mirrored in the responses from the small number of people who claimed to have noticed species-specific changes for green, hawksbill and leatherback turtles. Therefore, there appears to be a general perception that turtle nesting decreased before the moratorium, and that it has increased since.

As perhaps could be expected, a much higher percentage (80%, n=16) of the 20 former egg collectors identified through the TCOT SEQ said they had noticed a change in nesting, with their perceptions matching those of the interview respondents as a whole. Arguably these individuals may have a better idea of nesting trends, given their former practices. Eight (50%) of the former egg collectors that noticed a change noticed an increase in general nesting in the last 5 years, while 2 (12.5%) reported that levels of nesting had remained the same in the last 5 years. Five (31.3%) respondents reported that they had noticed a decrease in turtle nesting in living memory, while 3 (18.8%) reported an increase in nesting during the same period and 1 said that nesting had remained the same.

One interviewee who may have noticed trends in nesting on Captain's Bay is an Island Harbour fisherman (65 years+), who dries his nets on the beach there every day and has done so since the early 1970s. He regularly visits the beaches on the northern end of Anguilla to look out for fish and is also a former egg collector. He stopped collecting eggs in 1990 and now seems to take a great interest in turtle nesting activity from a conservation perspective. He reported an increase in hawksbill, leatherback and green turtle nests in the last 5 years, but a decrease in green and hawksbill nests since he can remember. He did not know how leatherback nesting activity had changed since the 1970s, but his observations on recent leatherback nesting increases would concur with recent increases in the shared nesting populations of BVI and USVI.

Perceived reasons for change

TCOT SEQ respondents were asked about reasons for perceived changes in nesting in Anguilla. Twenty-three (60.5%) of those who said they had perceived change gave

<i>In the last 5 years...</i>					
	Increasing	Decreasing	Same	Don't know	NR
Green	5	1	2	3	1
Leatherback	4	0	2	3	1
Loggerhead	0	0	0	3	1
Hawksbill	4	1	2	3	1
General	16	4	3	5	1

<i>Since you can remember...</i>					
	Increasing	Decreasing	Same	Don't know	NR
Green	1	4	1	4	1
Leatherback	0	3	3	3	1
Loggerhead	0	0	0	6	1
Hawksbill	1	6	1	2	1
General	7	16	2	3	1

Table 4.3. Perceptions of changing abundance of sea turtles nesting in Anguilla, in the last 5 years and since respondents can remember. (n=38 respondents who noticed some change. Note that not all respondents provided answers for every aspect of this question; NR- No response).

reasons why they believed there had been an increase in nesting either in the last 5 years or in living memory, while 26 (68.4%) gave reasons why they believed nesting had declined in the last 5 years or in living memory. Multiple responses were allowed for this question. The vast majority (78%, n=18) of those giving reasons for increase cited the moratorium as the reason for an increase in turtle nesting. Nesting females were regularly harvested on mainland Anguilla prior to the moratorium (see section 5.6.2). Though the moratorium has only been in place since 1995, it is possible that there has been a discernable increase in nesting during this period as, by all reports, it has brought about a much greater survival of nesting females and new recruits to the nesting population are no longer harvested. Other reasons cited included turtles becoming tamer, the cessation of harvest of nesting females and eggs, regional conservation initiatives and a research presence.

Of the 26 respondents that gave reasons for a perceived decline, 18 (69.2%) identified various kinds of harvest as the reason for this decline (See Table 4.4). This overarching harvest category includes turtle fishing (n=11), harvest of nesting females (n=3), harvest of eggs (n=3) and smuggling (n=1). The harvest of turtles and eggs will be discussed in greater detail in section 4.6.2 and 4.6.3. The second significant reason for decline identified by respondents was development and associated threats, cited by 15 (58%) respondents. This category includes development in general (n=7), habitat destruction (n=1), beach use (n=3), beach lighting (n=3) and boat traffic (n=1).

In Anguilla, the most significant factor affecting human populations in the last few decades has been a phenomenally rapid increase in tourism (Gell & Watson 2000). The scale of development on the island is also likely to have impacted Anguilla's turtles. In 1983, Meylan stated that the slow rate of development of the tourism industry had been a positive factor in the continued survival of Anguilla's turtle population. However, Anguilla's tourist industry flourished during the 1980s and early 1990s, when visitor numbers increased from 17,561 in 1982 to 125,780 in 1995 (Gell & Watson 2000). In 2003 a total of 109,282 visitors came to

Anguilla. Of these, 46,915 were stay-over tourists, while the remainder were excursionists or day visitors from neighbouring islands (www.gov.ai/statistics). There was a period of rapid construction and development that has slowed somewhat in recent years (www.anguillahomepage.ai). As mentioned above, increased development on nesting beaches has a number of adverse impacts on nesting turtles, and the TCOT SEQ indicates that awareness in Anguilla of these impacts is high. It is worth noting that the most frequently used nesting beaches on mainland Anguilla are largely undeveloped, and that nesting is reported to be high on the uninhabited Dog and Scrub Islands.

4.5.3. Genetics of nesting populations

No nesting green turtles or hatchlings were sampled in Anguilla during TCOT and only 2 hawksbill hatchlings were sampled, from recently emerged nests (Photo 4.11). Haplotypes described in the 2 samples that generated data during TCOT genetic analysis have also been described in **foraging** populations in Anguilla, BVI and TCI (via TCOT), Cuba, Mexico and Puerto Rico. TCOT genetic analysis has also revealed a previously undescribed haplotype, provisionally entitled TCOT3. During TCOT genetic analyses, TCOT3 was also discovered in **foraging** hawksbill populations in TCI, BVI and Montserrat, as well as in **nesting** hawksbill populations in TCI and Montserrat (see section 10.4.4).

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses during 2005 and more definitive answers will be available once this has been done. However, further sampling of Anguilla's nesting populations is required to fully understand and establish their genetic identity.

Samples were also collected from 5 hatchlings from recently emerged leatherback nests and one nesting female. Analysis of all 6 leatherback samples is pending.

Reasons cited for increase in turtle nesting (n= 23)								
Moratorium (18)	No take of eggs and females (4)		Increased awareness (2)	Research presence on beaches (2)		Regional conservation initiatives (1)		
Reasons cited for decrease in turtle nesting (n= 26)								
Harvest (18)				Development & related issues (15)				
Fishing (11)	Nesting females (3)	Eggs (3)	Smuggling (1)	Development general (7)	Beach use (3)	Beach lighting (3)	Boat traffic (1)	Habitat destruction (1)

Table 4.4. Summary of perceived reasons for the changes in turtle nesting in Anguilla.

Recommendations

4.1.2.1.b. Amend the Fisheries Protection Regulations

- i) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.
- ii) Ensure a closed season that protects breeding turtles in Anguillian waters from the 1st of April to the 30th of November inclusive, to be reviewed every 5 years (in order to react to possible shifts in nesting seasons due to climate change).
- iii) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.

4.1.2.3. Amend Planning Policy and Beach Protection Act

- a) Revise the Planning Department's proposed Land Use Plan (1996) so that Captain's Bay and Savannah Bay and all land at least 100m landward of the high tide marks of these Bays are protected from the adverse impacts of development. e.g by being re-designated as Conservation Areas.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example, light pollution, disturbance of nesting females and erosion on all other nesting beaches.
- c) Ensure that all developments that impact on marine turtle nesting or foraging habitat are required to undertake an environmental assessment that includes an evaluation of impacts and measures to mitigate negative impacts.
- d) Amend the Beach Protection Act (2000) in order to prohibit all sand mining at Windward Point (and any other turtle nesting beach), thereby allowing natural sand accretion and beach rehabilitation for marine turtle nesting.
- e) Under the guidance of the advisory committee (see 4.1.1.2), develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings and distribute recently produced National Trust advisory leaflet to all hotels to advise on mitigating against light pollution.

4.1.3.1 Establish systematic monitoring efforts at mainland index nesting beaches, as well as Dog and Scrub Islands

- a) Establish a sustainable programme of weekly morning nesting beach monitoring at index beaches on mainland Anguilla (e.g. Blackgarden Bay, Captain's Bay, Savannah Bay) and at least monthly

monitoring on Dog and Scrub Islands to determine nesting abundance and to facilitate genetic analysis of the nesting population through nest excavation and sampling.

NB. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the advisory committee, into seasonal, revenue-generating turtle walks for tourists in order to raise funds to contribute to marine turtle management efforts.

4.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to observe hatchling emergences.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure DFMR has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to sensitise Anguillians to the importance of protecting the nests of such small nesting populations and to encourage reporting of any illegal take of eggs or of nesting females.
- d) Develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings and distribute the recently produced National Trust advisory leaflet to all hotels to advise on mitigating against light pollution.
- e) Ensure school participation in rookery monitoring programmes to sensitise children to importance of rookery protection.



Photo 4.11. James Gumbs, (DFMR) excavating a hawksbill turtle nest at Captain's Bay (Photo P. Richardson/MCS).

4.6. Status of Foraging Marine Turtles in Anguilla

In 1983 Meylan reported that marine turtles were more abundant in Anguilla than at most of the other Leeward islands and attributed this to the extensive available habitat and slow growth of the tourism industry. Over the intervening 2 decades there have been some significant changes in Anguilla. The last habitat surveys were completed in 1995 and reports coincided with Hurricane Luis, which is said to have caused massive habitat destruction (Gumbs 2003). Tourist development and residential construction have gone through a boom since Meylan's report and are causing environmental problems (Proctor & Fleming 1999; Proctor & Hodge 1997). There are however still foraging populations of green, hawksbill and occasional loggerhead turtles in Anguillian waters (Proctor & Fleming 1999; Weidner et al. 2001).

Anguilla's Marine Parks Ordinance of 1982 empowered the Governor to designate Marine Protected Areas and acquire private land. The legislation was amended in 1992 to restrict damaging activities and impose fines or imprisonment as penalties. Five marine parks were established in 1993. Four of these, Sandy Island, Prickly Pear Cays - including the Seal Island Reef System, Island Harbour and Dog Island- were designed to protect reef systems and are managed by the Department of Fisheries (Gell & Watson 2000). A Marine Park Management Plan is still in the pipeline despite the fact that the marine parks have been in existence for some time. This document currently exists in draft. Anguilla has recently been successful in securing funding to progress work on coastal resource management and monitoring with the aim of enhancing long-term marine resource management from the Overseas Territories Environment Programme.

Green turtles: Juvenile green turtles are year round residents in Anguillian waters (Meylan 1983) and are relatively abundant at some localities around the island including Island Harbour, Sandy Ground, Little Bay and the Forest, and also around some of the outlying cays including Fish Hole Pond on Scrub Island. One fisher reported that he regularly has 12 to 15 small green turtles around his boat off Sandy Ground. Fifty-nine (81.9%) of the TCOT SEQ respondents reported that green turtles occur in Anguilla's waters, and recognition of this species is generally excellent. Green turtles captured during TCOT in-water sampling ranged from 23.5cm curved carapace length (CCL) and 80.6cm CCL (mean $\pm$ SD, 45.7cm $\pm$ 12.3, n=48). Thirty-five of these turtles were caught in Island Harbour and the remaining 13 in Fish Hole Pond, Scrub Island (Scrub Island: mean $\pm$ SD, 44.8cm $\pm$ 8.7, n=13). A green turtle weighing 48 pounds, which was tagged as a yearling at Merritt Island National Wildlife Refuge, Florida in 1975, was caught at Sandy Island in 1980 (Richardson & Gumbs 1983).

Hawksbill turtles: Foraging hawksbill turtles are present in Anguillian waters year round, especially in the extensive reef to the north of the island and around the offshore cays

(Meylan 1983; Proctor & Fleming 1999). From fisher reports and observations it appears there is extensive suitable foraging habitat for hawksbills in areas including Shoal Bay, Junks Hole and Savannah Bay, off the cliffs near North Hill Village (Katouche Bay), off the cliffs at Lower South Hill, Long Bay, Mead's Bay, between Shoal Bay and Blowing Rock, Sandy Hill Bay, Crocus Bay, Little Bay, Forest Bay, Limestone Bay and Scilly Cay. According to Meylan (1983), Anguilla was one of the few places in the region where hawksbills could still be routinely seen in shallow inshore habitat. More than 20 years later, TCOT staff observed that this is still the case in some areas. Sixty (83.3%) of TCOT SEQ respondents confidently identified the hawksbill turtle and reported that this species is present in Anguilla's waters - the highest percentage for all species. Hawksbills captured during TCOT in-water sampling ranged from 22.7cm to 37.3cm (mean $\pm$ SD, 27.7 $\pm$ 3.78, n=25). With the exception of one animal that was caught off Junk's Hole, all hawksbills sampled were caught on the reefs between Katouche Bay and Flatcap Point (Little Bay). Larger hawksbills have been reported from Sombrero Island (Meylan 1983). A TCOT SEQ respondent reported seeing large hawksbills off Captain's Bay as well as seeing mating hawksbills between the main island and Scrub. He reported that he usually sees larger turtles later in the year.



Photo 4.12. Green turtles captured during TCOT sampling in Island Harbour (Photo P. Richardson).

Loggerhead turtles: Not much is known about loggerheads in Anguillian waters, except that they occur infrequently. Meylan saw a subadult that had been caught off Scilly Cay in April 1980 that weighed about 54.5kg (Meylan 1983).

In February 2004, the DFMR was called to the same site as fishers had found an injured loggerhead in the bay (Photo 4.14). This animal had a curved carapace length of 70.5cm. It appeared to have been attacked by a shark and attracted a fair amount of media attention when it was released in Crocus Bay. Meylan suggests that identification of loggerheads by most Anguillians is unreliable because of the scarcity of this species (Meylan 1983). During the TCOT SEQ, only 35% (n=25) of respondents reported that this species occurs in the waters around Anguilla. Loggerheads are reported off Scrub, Dog and Sandy Islands (Meylan 1983). One fisher interviewed for the TCOT SEQ reported seeing a large loggerhead from the ferry between Anguilla and St Martin in May 2004.

4.6.1. Monitoring efforts

Data on the abundance of marine turtles in Anguillian waters were gathered via voluntary participation in Caribbean Turtlewatch and by in-water sampling using net based and hand capture methods.

4.6.1.1. Caribbean Turtlewatch- Anguilla

Caribbean Turtlewatch is a voluntary scheme designed to engage recreational divers in marine turtle monitoring. This method of information gathering was not particularly successful in Anguilla and produced limited results. Materials were distributed to all dive operators in Anguilla (n=3), but only Anguillian Divers completed any of the forms. A copy of the form and information sheet are given in Appendix 2.2-2.4. More detailed methodology is given in Section 2 of this report.

Caribbean Turtlewatch surveys were conducted in Anguilla between February and August 2003. During the period, 18 *Caribbean Turtlewatch* forms were completed, detailing

dives and turtle sightings. On all of these 18 occasions turtles were observed. Two reports were made by an independent snorkeller, the remainder by scuba divers. All dive reports were made by clients of Anguillian Divers. See Table 4.5 for summary of results.

The *Caribbean Turtlewatch* surveys that were completed have illustrated that green and hawksbill turtles are found in the waters of Anguilla. The latter is the most common species observed by divers. The majority of all turtles observed by divers were of juvenile/sub-adult size although a few of both species were of the size of breeding individuals.

When asked the question: *Did the chance of seeing a turtle influence your decision to choose this particular dive?* Of the 13 individuals that responded, 1 answered yes, 11 answered no and one was unsure. When asked the questions: *How important was your turtle sighting to the enjoyment of the dive?* 7 individuals responded that the experience was very important, 6 responded that it was important. These limited data suggest that while divers may not specifically choose to dive because they want to see turtles, a sighting is seen as important or very important and could therefore be said to significantly enhance the dive.

4.6.1.2. In-water sampling

Both hand capture and net-based sampling have been carried out in Anguilla (See Table 4.6).

Sampling methods

Net-based sampling (*Chelonia mydas*): In the absence of dedicated turtle nets, a variety of locally available nets have been employed in net-based sampling. These have ranged from large mesh set nets to Jack Seine nets. All sets have taken place in 2 locations, namely Fish Hole Pond (Scrub Island) and Island Harbour. Staff from the DFMR carried out all net sets with assistance from TCOT staff (when in country) and local fishers. Only one net set was carried out in Island Harbour, in the absence of TCOT staff. In 2002,



Photo 4.13. DFMR Marine Biologist, James Gumbs, and Fisheries Officer, Carlos Sasso, with hawksbill turtles captured by hand during TCOT sampling off the North Cliffs (Photo P Richardson).



Photo 4.14. The loggerhead turtle found in Island Harbour in February 2004 (Photo courtesy of DFMR).

Species	<25cm	26-50cm	51-75cm	>76	Unknown size	Total	Site
Green	0	1	2	3	1	7	2, 4, 5, 6
Hawksbill	0	2	3	2	2	9	1, 2, 3
Loggerhead	0	0	0	0	0	0	
Leatherback	0	0	0	0	0	0	
Unidentified	0	2	0	0	0	2	7

Table 4.5. Summary of species and size class of individual turtles observed by divers in Anguilla Feb-Aug 2003. Key to locations: ¹Anguillita, ²Osterdiep Wreck, ³Sandy Deep, ⁴Ooster Reef, ⁵Cathley House, ⁶Ida Maria, ⁷Junk Hole Bay.

the DFMR received funding from the British Chelonia Group (BCG) to construct 3 turtle nets for use in this project. These nets have been successfully used, but require adjustments in order to improve their performance. Once the nets have been perfected, a standardised replicable sampling method should be adopted. The DFMR currently follows procedures learned on the Bermuda In-water Course as closely as local conditions will allow. Tagging and data collection take place on the shore or on a DFMR boat, and turtles are returned to the water as early as possible, usually within an hour.

Hand capture: Hawksbill turtles have been captured either by snorkelling or using the Man-on-tow method to locate the turtles. Once a turtle has been located, personnel free dive to capture it. Tagging and data collection occurs on the shore or on a DFMR boat, and turtles are returned to the water as early as possible, usually within an hour.

Morphometric data: Straight carapace length, width and plastron length measurements are recorded for turtles on capture and following each recapture.

Genetic Sampling: Skin biopsies are obtained from a rear flipper with a sterile 4-millimetre biopsy punch or scalpel and preserved in a buffer solution of 20% dimethyl sulfoxide (DMSO) saturated with Sodium Chloride (NaCl) (Dutton 1996).

Tagging: All captured turtles are tagged according to standard protocols to prevent collection of duplicate genetic samples and to elucidate demographic parameters. Metal Inconel tags are applied to the posterior edge of each front flipper and Passive Integrated Transponder (PIT) tags are injected into the left shoulder muscle (Balazs 1999).

4.6.2. Data from the TCOT Socio-economic Questionnaire (SEQ)

Perceived trends in turtles in Anguilla's waters

As part of the TCOT SEQ, all 72 questionnaire respondents were asked about changes in the number of turtles seen in Anguilla's water over time (in the last 5 years and in living memory), both in general and for specific species. Fifty-three respondents (73.6%) reported that they had noticed changes while 18 (25%) did not, and 1 did not answer the questions. A summary of these general perceptions of trends in the number of turtles in Anguilla's waters is shown below (Table 4.7).

Of those answering these questions for turtles in general, 26 (49%) respondents reported an increase in the number of turtles around Anguilla in the last 5 years, while 3 (5.6%) reported a decrease. None of the respondents who noticed species-specific changes for green, hawksbill and leatherback turtles reported a decrease.

Species	Captures to date	Location	Method	TOTAL/SPP.
Green	13	Fish Hole Pond, Scrub Island	net	48
	35	Island Harbour	net	
Hawksbill	8	Crocus Bay	hand capture	24
	5	Little Bay	hand capture	
	9	North Hill Cliffs	hand capture	
	1	Junks Hole Bay	hand capture	
	1	Shoal Bay	hand capture	
TOTAL CAPTURE FOR ALL SPECIES: 72				

Table 4.6 Summary of marine turtle captures in Anguilla.

Sixteen (30.1%) respondents answering for turtles in general reported a decrease in the numbers of turtles in Anguilla's waters generally since they could remember, while 9 (16.9%) reported an increase and 1 respondent suggested that the number of turtles in Anguillian waters had remained the same. Respondents who said they had noticed species-specific changes for green, hawksbill and leatherback turtles also indicated this perception of a decrease in the number of turtles in Anguilla's waters in living memory.

Based on their regular observations of turtles at sea during the course of their work and their particular interest in turtles, one might expect that former turtle fishers would be particularly well placed to detect changes in the abundance of turtles at sea. A high percentage of former turtle fishers (89.2%, n=25) reported that there had been a change in the last 5 years, while only 2 (7.1%) reported no change in the same period. All of the former turtle fishers who reported a change in the population of green turtles in Anguilla's waters in the last 5 years said there had been an increase. The same is true for hawksbills.

Perceived reasons for change: TCOT SEQ interviewees were asked about reasons for perceived changes in the abundance of turtles in Anguilla's waters. Forty-seven (88.6%, n=53) of those who said they had perceived a change gave reasons why they believed there had been an increase in the number of turtles either in the last 5 years or in living memory, while 40 (75.4%, n=26) gave reasons why they believed numbers had declined in the last 5 years or in living memory. Multiple responses were allowed for this question. The vast majority (89.3%, n=42) of those giving reasons for an increase cited the moratorium. The remaining respondents cited the fact that turtles are tamer in

Anguilla (n=7), that there has been a cultural change away from turtle use (n=3), that there is increased awareness of conservation issues (n=2), the fact that there had not been any hurricanes recently (n=1) and regional conservation initiatives (n=3) as reasons for the perceived increase. It is interesting to note that 3 of these respondents noted that, although there were more turtles now, there used to be larger turtles in the past.

Of the 40 respondents that gave reasons for a perceived decrease in the number of turtles in Anguillian waters, 39 (97.5%) identified fishing as the cause. Nineteen of these specifically indicated that they felt the resource was overexploited. Other reasons cited included hurricanes (n=1), habitat destruction (n=1) and smuggling (n=1).

4.6.3. Genetics of foraging populations

TCOT genetic analyses have shown that the haplotypes of foraging turtles in Anguilla have also been described in a number of other nesting and foraging sites (see 10.4.4).

Foraging green turtles in Anguilla

Samples were taken from 51 foraging green turtles in Anguilla. Sixteen of these samples have been analysed to date. Haplotypes described in the 16 samples that generated data during TCOT genetic analysis have also been described in **foraging** populations in TCI, Montserrat and BVI (via TCOT), Bahamas, Barbados, Florida, Nicaragua and West Africa. Some of these haplotypes have also been described in **nesting** populations in Ascension Island, Aves Island, Brazil, Costa Rica, Florida, Mexico, and Suriname, as well as Bioko, Guinea Bissau, Sao Tome and Principe on the West coast of Africa. Analysis also identified one haplotype, provisionally entitled TCOT1, that has not been described from any other population.

<i>In the last 5 years...</i>					
	Increasing	Decreasing	Same	Don't know	NR
Green	24	0	0	0	1
Leatherback	2	0	3	14	1
Loggerhead	1	0	1	13	1
Hawksbill	22	0	1	0	1
General	26	3	0	1	1

<i>Since you can remember...</i>					
	Increasing	Decreasing	Same	Don't know	NR
Green	10	11	0	2	1
Leatherback	0	1	1	16	1
Loggerhead	0	0	1	13	1
Hawksbill	9	10	0	4	1
General	9	16	1	4	1

Table 4.7. General Perceptions of changing abundance of sea turtles in Anguillian waters, in the last 5 years and since respondents can remember (n=53 respondents who noticed change; NR- No response).

Reasons cited for increase in the number of turtles in Anguillian waters (n=47)					
Moratorium (42)	Turtles tamer (7)	Cultural change (3)	Regional conservation initiatives (3)	Increased awareness (2)	No recent hurricanes (1)
Reasons cited for decrease in the number of turtles in Anguillian waters (n=40)					
Fishing (39)		Hurricanes (1)	Habitat destruction (1)	Smuggling (1)	

Table 4.8 Summary of perceived reasons for the changes in the number of turtles in Anguillian waters.

Foraging hawksbill turtles in Anguilla

Samples were taken from 22 foraging hawksbill turtles in Anguilla. Five of these samples have been analysed to date. Haplotypes described in the 4 samples that generated data during TCOT genetic analysis (1 sample failed) have also been described in **foraging** populations in TCI, BVI, CI and Montserrat (via TCOT), Cuba, Mexico and Puerto Rico. Some of these haplotypes have also been described in **nesting** populations in Antigua, Barbados, Brazil, Cuba, Mexico, Montserrat (via TCOT), Puerto Rico and the US Virgin Islands. One of the haplotypes had not been described prior to TCOT and has now only been described from **foraging** turtles in Anguilla, BVI, Montserrat and TCI and **nesting** turtles in Anguilla, Montserrat and TCI.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses during 2005 and more definitive answers will be available next year. At this point, however, it can be clearly highlighted that the turtles foraging in Anguillian waters will undoubtedly include those originating from a number of nesting colonies across the Caribbean region. Detailed information will be disseminated as part of the cross-territory FCO Overseas Territories Environment Programme (OTEP) funded project, which will focus on Turtle Conservation and the Environment Charter and Multilateral Environment Agreements. However, further sampling of Anguilla's foraging turtle populations is required to fully understand and establish their genetic identity.

Recommendations

4.1.2.2. Amend the Marine Parks Act

a) Ensure that all five 'designated' marine parks are fully described in Schedule 1 of the Marine Parks Regulations.

b) Ensure that marine turtles have permanent and complete protection within Anguilla's Marine Parks. This should include no take zones as well as policies to curb potential negative tourism impacts e.g. through SCUBA diving and snorkelling.

4.1.3.1. Establish systematic monitoring efforts at mainland index nesting beaches, as well as Dog and Scrub Islands

b) Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes at Island Harbour and other identified green turtle foraging sites (nets & CPUE), and on the stretch of coast from Little Bay to Sandy Ground and other identified and accessible hawksbill turtle foraging sites (snorkel surveys) to determine abundance trends.

c) Establish a regular and frequent (quarterly) genetic sampling regime at Island Harbour (nets), Scrub Island (nets), Shoal Bay (hand capture) and Little Bay/ Sandy Ground (hand capture) to increase understanding of genetic stock composition of green and hawksbill turtle populations.

NB. Steps should be taken to encourage the involvement of interested local fishermen in all monitoring programmes (e.g. CPUE monitoring in Island Harbour and elsewhere), and financial incentives should be considered.

4.1.4.2. Implement general awareness programmes regarding marine turtle conservation in Anguilla

a) Develop the Anguilla National Trust turtle specific educational materials, and expand them to include further curriculum linked, multi-media materials where appropriate.

b) Raise awareness among Anguillians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.

c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.

d) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.

e) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.

4.7. Direct Use of Marine Turtles in Anguilla

4.7.1. Overview

Connor and Connor (1998) interviewed several fishers ranging in age from 50 to 92 years old who recount lifetime anecdotes of turtle capture, egg harvest and utilisation. Fishers would capture green turtles at sea with trammel nets and hawksbills by hand, as well as taking occasional turtle bycatch in fishing lines. Older fishers and their families say that they are able to see where turtles will nest by looking for “tracks in the sky” (a herringbone cloud formation resembling turtle tracks) and in days gone by people would follow these tracks to the nesting beach. Nesting females were turned and harvested and nests were excavated for eggs, which some men considered to have aphrodisiac properties (Connor & Connor 1998; R Hodge (DFMR) pers. comm. 2003). Eggs of all species were taken whenever they were encountered (Meylan 1983).

Turtle meat was either sold locally to households, hotels and restaurants, or exported to neighbouring islands, particularly St Martin, where the larger tourism industry provided a steady demand (Meylan 1983). There was also a trade in turtle shells, with dedicated traders from Puerto Rico, St Lucia and St Thomas buying from Anguillians at US\$20 per kg, and by the early 1980s, the scale of this export was a cause for concern (Connor & Connor 1998; Meylan 1983; Richardson & Gumbs 1983; R Hodge (DFMR) pers. comm. 2003). At the same time, spearfishers, realising the value of tortoiseshell, started targeting hawksbills of all size classes and the island's total catch of turtles was reported to have increased to unprecedented levels (Meylan 1983). Some fishers continued to use nets and in Little Bay a catch of between 3 and 5 turtles a day, or “enough to call the butcher”, was reported as not uncommon prior to the current moratorium on turtle fishing (Rogers, pers. comm. 2002). In response to concern from NGOs and the general public about a perceived decline in local turtle populations, harvesting of turtles and their eggs was completely prohibited in Anguilla by the Fisheries Protection (Amendment) Regulations, 1995 (Connor & Connor 1998). Interestingly, there were no data to validate these concerns, but the legislation was passed regardless, possibly as a result of NGO and Government consultation with representatives from WIDECast (R Hodge (DFMR) pers. comm. 2003). Though no consistent monitoring of Anguilla's turtle populations was carried out between 1995 and 2000, the moratorium was extended for a further 5 years from the 15th December 2000.

The key domestic legislation with regard to marine turtle exploitation in Anguilla is the Fisheries Protection Regulations (2000) outlined in Table 3.1. These Regulations extend the moratorium on take of turtles and their eggs for 5 years from the 15th December 2000. The Government of Anguilla will review this element of the Act and decide the future of the moratorium by December 2005. The moratorium was originally introduced by The Fisheries Protection (Amendment) Regulations, 1995. However, prior to this amendment, the Fisheries Protection Regulations, 1988 permitted the regulated take and sale of turtle eggs

and meat between the 1st of October and the 31st May in any year and the minimum size limit for harvested turtles was 20lb (9.07kg). Anyone contravening these regulations was liable to a fine of EC\$5,000 and/or imprisonment for 12 months. Under the Fisheries Protection Regulations (2000) anyone found in contravention of the moratorium is liable to a fine of up to EC\$50,000 or up to one year imprisonment, or a fine of EC\$250,000 and imprisonment for 2 years for a second or subsequent offence, or to both such fine and imprisonment.

It is suggested that marine turtle stocks in Anguilla are depleted (Connor & Connor 1998; Meylan 1983), but it is impossible to confirm this as no long-term monitoring programmes have been implemented. The current moratorium on turtle fishing was expected to give responsible agencies and stakeholders an opportunity to reassess marine turtle management in Anguilla. However, this has not been achieved and the lack of information regarding the current status of turtles is recognised as a significant problem by the Government of Anguilla (K. Hodge (Government of Anguilla) pers. comm. 2004).

The case for maintaining the moratorium is considerably weakened so long as the Government of Anguilla fails to implement monitoring programmes to ascertain trends in local turtle populations. TCOT staff carried out informal interviews during early field trips with some fishers who were most active in the turtle fishery prior to the moratorium and who have so far complied with this legislation. They indicated that they would see a future unexplained extension of the moratorium as an infringement of their basic human rights, and have threatened to flout the law and fish for turtles again if the moratorium is extended for a third time without scientific justification.

There have already been numerous representations by fishers to the Government of Anguilla in favour of dropping the moratorium when the current legislation expires in December 2005 (R Rey (Government of Anguilla) pers. comm. 2002). The turtle moratorium not only brought an end to turtle fishing, but also the use of gill nets. In some quarters, it is thought that turtle fishing has never been a major source of income, but that the net ban is perhaps more controversial as this affects the take of other species and could have more significant economic impacts. The Executive Council has made it clear that the necessary information must be made available to ensure that they are able to take an informed decision on this issue by the end of 2005 (R Rey (Government of Anguilla) pers. comm. 2002).

Table 4.9 presents turtle fishers' attitudes to fishery conservation options. Most fishers agreed that there should be regulations for the type of fishing gear that can be used to catch turtles, that there should be size limits for turtles caught and that there should be open and closed seasons for turtle fishing. There was less support for quotas, but many fishers qualified this by saying that there was no point suggesting this management method as it would be unenforceable in Anguilla. This does not necessarily suggest

that they disagree with quotas in principle. Many felt that open and closed areas for turtle fishing were impractical because turtles move freely through Anguilla's waters and they did not feel that closed areas would afford the turtles any protection. Forty-six % (n=13) of the 28 fishers who responded to this section thought that there should be some controls on which species of turtles are caught. Among the reasons for supporting this measure were that it would allow fishers to target the most plentiful species (5), that it would protect hawksbills, as they are too easy to catch (6), and that it would allow people to target their preferred species, the green turtle (4).

The option with the highest level of consensus amongst the turtle fishers was the size limit option, where 82% agreed. The majority specified that they would support a *minimum* size limit, with suggested lower limits ranging from 25lbs – 55lbs. Five fishers suggested that there should be upper and lower limits and specifically indicated that it was important to protect the larger, breeding turtles. Where respondents did not mention an upper size limit and were asked about their opinions on this issue, they were often not convinced that this would be a useful conservation measure and there were indications that there may be some resistance to the establishment of upper size limits.

Recommendations

4.1.2.1. Amend the Fisheries Protection Regulations

TCOT recommends replacing the moratorium on turtle fishing in Anguilla with a 3 year active and participatory research programme. For the duration of this research programme there should be no harvest of marine turtles in Anguillian waters. The programme should assess the viability of establishing a highly regulated experimental turtle fishery by 2009 and should be characterised by active involvement of fishers and open dialogue between all stakeholders. Capacity building to ensure that the DFMR will be equipped to effectively manage a turtle fishery, should it be established, should begin immediately.

a) Short to medium term

- i) *The Advisory Committee described in 4.1.1 should immediately start to seek funding for a participatory marine turtle research programme and solicit the participation of interested fishermen in the in-water and nesting beach monitoring and sampling regimes described below.*

a There should be regulations for which species of turtle can be caught					
	yes	no opinion	no	na	no answer
n	13	4	6	4	1
%	46	14	21	14	4
b There should be regulations for the type of fishing gear and methods that can be used to catch turtles					
	yes	no opinion	no	na	no answer
n	19	2	2	4	1
%	54	6	30	14	4
c There should be regulations for the number of turtles that can be caught					
	yes	no opinion	no	na	no answer
n	8	1	10	8	1
%	29	4	36	29	4
d There should be size limits for turtles caught					
	yes	no opinion	no	na	no answer
n	23	0	0	4	1
%	82	0	0	14	4
e Open and closed zones should be set for turtle fishing					
	yes	no opinion	no	na	no answer
n	9	3	9	6	1
%	32	11	32	21	4
f Open and closed seasons should be set for turtle fishing					
	yes	no opinion	no	na	no answer
n	20	1	0	6	1
%	71	4	0	21	4

Table 4.9. Views of turtle fishers on options for managing the turtle fishery.

b) Long term

Once abundance trends of green and hawksbill turtles have been established through the programmes described below, and if they are deemed favourable to reopen a turtle harvest, amend the Fisheries Protection Regulations as follows:

- i) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs
- ii) Ensure a closed season that protects breeding turtles in Anguillian waters from the 1st of April to the 30th of November inclusive, to be reviewed every 5 years (in order to react to possible shifts in nesting seasons due to climate change)
- iii) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for turtles that should be stipulated in any amended legislation.
- iv) Consider a continued minimum size limit, as most fishermen already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for turtles that should also be stipulated in any amended legislation.
- v) Establish a limited licensing scheme for turtle fishing whereby turtle fishing is restricted to licensed individual fishermen who are required to abide by strict regulations regarding fishing practice. Harvest quotas should be adaptive and based, *inter alia*, on the number of licensed turtle fishers and stock assessments established through the monitoring regimes*.
- vi) Establish regulations with regard to the type of gear that can be used to capture turtles. Possible regulations could ensure permanent and complete prohibition of all turtle capture methods excluding hand capture and use of turtle nets, with strict specifications for legal net structure and use.
- vii) Ensure prohibition of the harvest of loggerhead and leatherback turtles in Anguillian waters. The Government of Anguilla have also expressed that they would recommend prohibition of any future take of hawksbill turtles.

NB. Any future turtle fishery must be accompanied by systematic monitoring regimes as described below, along with a programme to monitor Catch per Unit Effort of licensed fishermen, and biometrics of turtle catch, which should also be implemented by the DFMR. In the event of the reopening of Anguilla's turtle fishery, the Fisheries Protection Act must be further revised to provide statutory powers to react to the ongoing results of the abundance trend monitoring programmes. In the event of declining abundance trends or declining Catch per Unit Effort below pre-established thresholds, the DFMR must have the power to temporarily or permanently close the turtle fishery.

The TCOT SEQ revealed that the moratorium on turtle fishing is a subject of significant local interest. When asked if they could describe any laws regarding turtles in Anguillian waters, 95.8% (n=69) of respondents answered in the affirmative. All 69 respondents who said they were aware of the law explained that it is illegal to fish for turtles in Anguilla. Most mentioned the ban or moratorium specifically. However, only 12 of those who said they could describe the law referred to the fact that there are penalties in place and none were aware of what these are. It appears that, though the vast majority of people are aware of the law, very few are aware of what penalties might be incurred if the law is broken. In a separate survey, when informed of the existing penalties, several TCOT SEQ interviewees said that a fine of up to EC\$250,000 was wholly inappropriate and some suggested that the severity of the penalty may also result in Fisheries Officers being reluctant to prosecute. It is worth noting that there have been no successful prosecutions in Anguilla to date despite a handful of instances where the authorities have apprehended individuals who were in contravention of the moratorium. The most recent incident took place on the 19th of March 2002. Three individuals in a boat took a juvenile hawksbill turtle in Crocus Bay and transported it by boat to Island Harbour where they were met by the regular police (as the special marine police could not be contacted) and Department of Fisheries officers. A decision was taken not to prosecute on this occasion due to the particular circumstances of the individuals involved, and instead a very public warning was issued, which all involved felt was a more appropriate course of action (Vanterpool (DFMR) pers. comm. 2002).

Recommendation

4.1.2.1. a.

- ii) Change the current penalty for contravening the moratorium under the Fisheries Protection regulations, to a more appropriate penalty in line with other offences under the Act (e.g. Fine of EC\$5,000 and/or imprisonment for up to 12 months).

The Survey audience

Data on use of marine turtles were gathered using the TCOT SEQ. In Anguilla 72 questionnaires were completed and a breakdown of information gathered on marine turtle exploitation is given in the Table 4.9.

4.7.2. Harvest of adults on the nesting beach

We have not sourced any historical accounts of the level of exploitation of nesting female turtles in Anguilla, though anecdotal reports suggest that females were routinely turned on the nesting beach (Connor & Connor 1998). WIDECAST report that before the 1970s, nesting female green, hawksbill and leatherback turtles were regularly taken from Anguilla's beaches and that the capture of 2 turtles in one night would be considered a 'big catch' (WIDECAST in prep). One of the older TCOT SEQ respondents recalled that competition for

nesting females and their eggs reached a level where some fishers would set nets across the approach to the nesting beach, if they expected a female to come ashore to nest, so that they could be assured of capturing the turtle and getting her unlaidd eggs. Eight (29%) of the respondents who fished for turtle reported that they had, in the past, turned turtles on the nesting beach. None of them reported that they were still taking turtles from the nesting beach and, by all accounts, the practice has disappeared.

One of the 8 fishers who used to take females on the nesting beach reported taking green turtles. He estimated that the largest green turtle he ever caught weighed 136.1kg (300lbs). Five fishers reported taking hawksbill turtles from the nesting beach. Estimates for the size of the largest hawksbills they ever caught ranged from 56.7kg (125lbs) to 226kg (500lbs). Marquez (1990) suggests that the first maturity of female hawksbill turtles should be reached at between 68 and 80cm (straight carapace length) and at body weights of 40-56kg, depending on the locality. Two fishers did not distinguish which species they took from the nesting beach, but answered for turtles in general. They estimated the size of the largest turtles they had ever caught at 90kg and 204.1kg. Because all 8 respondents who took females on the nesting beach also fished for turtles using other methods, it is not possible to discern from the TCOT SEQ how often or in what numbers nesting females were taken by these 8 respondents. When asked about their reasons for no longer harvesting turtles, 50% (n=4) of this group reported that they had stopped using turtles because of the moratorium. Two stopped when they retired. One believed that turtles were getting scarce and decided to stop and for one fisher a reason was not recorded.



Photo 4.15. Island Harbour fishers with a juvenile green turtle captured during in-water sampling carried out in Island Harbour with fisher assistance (Photo P. Richardson).

4.7.3. Harvest of eggs

Connor and Connor (1998) report that there was a local demand for turtle eggs and it has been suggested that eggs were collected whenever they were encountered (Meylan 1983). During the TCOT SEQ, 20 former egg collectors were interviewed, all of whom reported that they no longer collected turtle eggs. However, during surveys of Anguilla's mainland nesting beaches in 2001, an Anguilla National Trust Volunteer recorded illegal take of nests on Long Bay (leatherback), Mead's Bay (leatherback), Katouche Bay (leatherback), Captain's Bay (leatherback and hawksbill) and Windward Point (leatherback). Furthermore, Marianne Fish (University of East Anglia) recorded possible take of nests on Captain's Bay (hawksbill), Savannah Bay (hawksbill) and Prickly Pear Cays (species unknown) in 2003 (K. Hodge (Government of Anguilla) pers. comm. 2003; M Fish (UEA) pers. comm. 2003). Members of the TCOT staff have also received reports of egg collection on Prickly Pear Cays since the introduction of the moratorium.

There has been legislation in place to prohibit the taking of turtle eggs either seasonally or completely since 1947, when egg collection and sale was prohibited between 1 June and 30 September, under the Turtle Ordinance. However, only 20% of former egg collectors indicated that the law influenced them to stop collecting eggs. When asked when they had stopped collecting eggs, 75% of former collectors reported that they had stopped by the 1980s with only 15% continuing to collect in the 1990s. For 40% of former collectors, conservation was the motivation behind stopping, due to a perceived decrease in the number of nesting females, and a realisation that if egg collection continued the nesting population could disappear. Other reasons for stopping included a lack of interest (n=1), a lack of time (n=1), not having the skill the old fishers had to find eggs (n=1) and not actually liking the taste of eggs (n=3).

From information provided by 10 of the former egg collectors, it appears that egg collection peaked in June, July and August when 70 - 80% of former collectors who answered this question reported being active (see Figure 4.5). These are the months during which egg collection has been illegal since 1947, suggesting that legislation has not been a key factor controlling egg collection practices in Anguilla.

In terms of the frequency of egg collection, 20% (n=4) of respondents reported to have only collected eggs once or twice in their lifetime, 35% (n=7) reported collecting eggs yearly, 15% (n=3) monthly and 10% (n=2) weekly during the season. Sixty-five % (n=13) reported that the most significant factor influencing when they took eggs was opportunity. This reinforces the belief expressed by Meylan (1983) that eggs were taken whenever they were encountered, but suggests that, for most people, egg collection was only an occasional occupation.

Half the respondents in this group (n=10) said that they did not distinguish between species when collecting eggs, while 7 (35%) said they collected hawksbill eggs and 3 (15%) said they collected green turtle eggs. The majority

Measures of direct exploitation	Past	Present	Never	No response or not applicable
By life stage				
Females on beaches	8	0	20	44
Eggs from beach	20	0	51	1
Turtles in water (intentional)	27	1	-	44
Turtles in water (incidental)	20	?	-	-
By product				
Meat				
Fishers who sell meat	28	0	-	-
Meat vendors	9	0	-	-
Meat consumers	62	1	8	1
Eggs				
Collectors who sell eggs	0	0	-	-
Egg vendors consumers	0	0	-	-
Egg consumers	33	0	37	2
Non-edible				
Fishers who sell shells	11(whole shells) 11(scutes)	0	-	-
Shell vendors	3(whole shells) 1(scutes)	0	-	-
Shell consumers	34(whole shells) 17(scutes)	0	35(whole shells) 51(scutes)	-
Measures of indirect exploitation				
Turtles indirectly used in business	6 advertising	12 attraction	9 feature of professional activities	
Total interviews	72			

Table 4.10. Numbers of TCOT SEQ respondents involved in exploitation, by exploitation category

said they did not have a preference for the eggs of one species over another with only 2 individuals reporting a preference for green turtle eggs and 2 for hawksbill eggs because these species are good eating, culturally familiar and should produce good eggs.

One of the former egg collectors, who stopped collecting in the early 1970s, reported that he used to sell the eggs from less than 20 nests per year. He would determine the price and the eggs would be sold to people at their homes. This individual reports that the price of eggs rarely changed, but he could not remember what eggs would sell for.

All 72 respondents to the SEQ were asked whether they had ever consumed turtle eggs and 33 (45.8%) reported that they had. None said that they were currently eating turtle eggs. The frequency at which people reported consuming turtle eggs mirrors the picture of egg collection above. Twenty-three egg consumers reported how often they used to eat eggs and 91.3% (21) reported that they did so less than once a year. Only 1 egg consumer said they would eat

eggs yearly (i.e. at least once a year) and 1 that he would eat eggs weekly during the season.

Four consumers said that they would actually purchase the eggs and all would buy them directly from the collector's home. All others would either collect eggs themselves or receive them as a gift. One person remembered paying US\$11.19 for 40 eggs on one occasion (US\$0.28/egg). Nine consumers reported giving eggs to friends, family or neighbours as a gift, but most said they would keep eggs for consumption in their own household. Though the use of turtle eggs as an aphrodisiac has been widely reported, only 3 respondents in this case suggested that turtle eggs enhanced virility. Consumers reported a decrease in the availability of eggs to purchase both in the last 5 years as well as in living memory.

From data gathered during the SEQ, it appears that turtle eggs were a rare and highly prized treat. For the most part they were not a cash commodity, but were collected and shared among neighbours, family and friends. It is possible

that the use of turtle eggs decreased in line with the decline of the nesting population rather than as a result of legislation, but egg consumption continued into the 1990s.

4.7.4. Harvest at sea

Information about the historical harvest of marine turtles in Anguilla is fragmentary. Richardson & Gumbs (1983) reported that between 5 and 10 fishers were harvesting turtles in Anguilla in the early 1980s and that none were entirely dependent on this harvest for their livelihood. It was reported that hawksbill, green and loggerhead turtles, caught by spear fishing or turtle nets, were landed at Sandy Ground, Island Harbour, Crocus Bay and Rendezvous Bay. Meylan (1983) reports that leatherback meat is also eaten in Anguilla. WIDECAST estimated that approximately 20 full and part-time fishers were harvesting turtles prior to 1995 (WIDECAST in prep.)

It appears that not all turtles harvested in Anguilla were used in Anguilla. Meylan (1983) reported that fishers took turtles to St Martin where there was a steady demand from the many hotel restaurants. There are also reports of foreign divers, equipped with spear guns, coming to Anguilla for fish, lobsters and turtle, particularly in the region of Dog Island and though there are no clear estimates of this harvest, it is thought to be “significant” (Richardson & Gumbs 1983). Meylan (1983) suggested that the depleted status of local turtle stocks in St Martin meant that the demand for souvenirs made from turtles and turtle meat had to be met by divers travelling to neighbouring islands including Anguilla, St Martin’s nearest neighbour.

The TCOT SEQ represents an attempt to improve the understanding of the nature and extent of the historical marine turtle fishery in Anguilla, while shedding a little light on the ongoing limited illegal take of turtles for subsistence use. Weidner *et al.* (2001) reported that local environmental groups, fishers and other interested parties are becoming increasingly troubled by illegal harvesting, but during TCOT staff visits, most stakeholders, from environmental groups

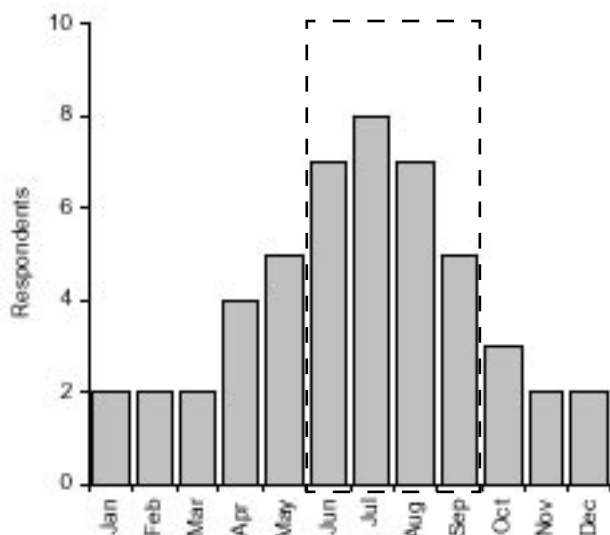


Figure 4.5. Indication of the seasonality of former turtle egg collection. The dashed line represents the historical closed season in Anguilla.

to government representatives and the fishers themselves, expressed the belief that there was now only a very limited covert take of turtles in Anguilla.

The TCOT SEQ identified 51 people who reported that they fish for cash, subsistence or pleasure. Of these, 27 (52.9%) reported that they used to fish for turtles. Green and hawksbill turtles were the species most commonly harvested and there was a limited take of loggerhead and leatherback turtles. The most recent estimates put the number of fishers in Anguilla at around 400 (Gell & Watson 2000; R.Hodge (DFMR) pers.comm. 2002). The SEQ sample does not provide insight into the percentage of all fishers who may have been involved in the turtle fishery, but it seems likely that the opportunistic and intentional take of turtles was not uncommon among Anguillian fishers up until 1995 when the moratorium was introduced.

One fisher reported that he still takes turtles despite the current moratorium. This fisher’s current harvest is limited to the occasional turtle, taken opportunistically, for personal consumption. All respondents to the SEQ were asked whether they were aware of any activities that contravened the moratorium. Nearly half (47.2%) said they believed that there was still some use of turtles in Anguilla and 2 of these people said that they would take a turtle if they had the chance. All who said they were aware of an illegal turtle harvest characterised it as occasional take. In addition, 4 people said that they did not know of any take of turtles, but suspected that it did go on. The fact that nearly half the interview audience were aware of infringements does not necessarily mean there is a lot of illegal turtle fishing going on. There have been one or two well-publicised cases and Anguilla is a small island. It is likely that respondents were referring to the same incidents. It was not possible to build up an accurate idea of how many people were referring to the same incidents as many people were uncomfortable with this question and did not want to discuss details they felt would incriminate others.

Whereas some fishers would intentionally set nets or go out spearfishing to capture turtles, others would capture them opportunistically while targeting other species like lobster. A summary of information about intentional and opportunistic catch (see Figure 4.6) suggests that most green turtles were caught intentionally while slightly more hawksbills were captured opportunistically. Most turtle fishers (82%) reported that they preferred green turtles because of their superior meat. Fifty-four % (n=15) selected hawksbills as their second choice.

Twenty-two fishers provided estimates of numbers for green turtles caught, and 18 fishers provided estimates for hawksbill turtles. For green turtles, numbers caught ranged from a minimum of 1 to a maximum of 2,000 per year (median (IQ range) = 25(8-190)). Fishers reported catching green turtles of varying sizes, with the minimum size reported being 4.5kg and the maximum being 136.1kg. The reported ‘average’ sized catch ranged from 9.1-117.9kg. For hawksbill turtles, the number of turtles caught ranged



Photo 4.16. Fishing craft in Island Harbour (Photo: P. Richardson).

from a minimum of 1 to a maximum of 100 (median (IQ range) =13(5-43)) per year. It was reported that hawksbills from 4.5kg – 226.8kg were captured. The reported average size ranged from 9.1-124.7kg.

There was little difference reported in the frequency of fishing across species. If fishers reported catching more than one species, they would generally do so for the same amount of time for each species caught. This is with the exception of 2 fishers who reported fishing more frequently for green turtles and less frequently for hawksbills. Of the remaining 26 turtle fishers interviewed, 12 reported fishing weekly, 6 fished for turtles monthly, 4 yearly and 4 daily.

All but one of the turtle fishers interviewed (n=27) provided information on what factors would influence when they fish for turtles. Amongst the most important motivations reported for turtle fishing were opportunity (n=7), the phases of the moon (n=7), the season (n=6) and the weather (n=6). Other factors motivating fishers to take turtles are detailed in Table 4.11.

Turtles were most commonly captured using nets, but spear guns were frequently used and fishers also reported catching turtles at sea by hand and taking nesting females on the beach.

4.7.5. Trade in turtle meat

4.7.5.1. Sale of meat by turtle fishers: 71.4% (n=20) of the turtle fishers interviewed reported to have sold either whole turtles or turtle meat. The total volume of meat reported to have been sold for each species is outlined in Table 4.12.

Whole turtles: Unbutchered turtles were sold by 9 of the turtle fishers interviewed. They reported a total annual sale of 1,801 turtles (median (IQ range) = 80 (21-150).) The data suggest that, particularly for green turtles, there were a small number of individuals with a high volume of sales while most fishers sold whole turtles at a much lower volume. Two fishers reported selling a combined total of 1,350 whole green turtles per year (i.e. 82.4% of the total

annual sale reported) while the volume sold by the other 6 ranged from 9 to 150 turtles per year. Respondents reported that the average price for turtles sold whole ranged from US\$0.75/lb to US\$1.44/lb, that it was set by the fisher and that the price rarely changed.

Whole turtles were sold at a variety of places, with most fishers (n=7) reporting that they would sell turtles from their own home or by taking it to the home of a customer. Fishers also reported selling whole turtles on the street (n=5), at the harbour (n=2), to restaurants (n=6), to hotels (n=2) and at a market (n=4). All respondents who said they took their turtles to market specified that this market was in St Martin (2 specified Marigot). The fisher who reported selling 1,000 whole turtles per year sold his whole catch to restaurants, hotels and the market in St Martin, while the fisher who sold 350 whole turtles per year also reported taking some of his catch to St Martin. This information supports Meylan's (1983) observations in the early 1980s of a flourishing trade in turtles between Anguilla and St. Martin.



Photo 4.17. A juvenile hawksbill turtle taken illegally in 2002 and seized by the DFMR (Photo S. Ranger).

Butchered turtles: Twenty (71%) of the turtle fishers interviewed reported that they butchered turtles and sold the meat. They reported a total annual sale of 3,222 turtles (median (IQ range) = 24 (10.5 –202.5)). Once again, the data suggest that there were a small number of individuals with a high volume of sales while most fishers sold turtle meat at a much lower volume. For example, green turtle meat was most regularly traded and 2 of the 12 fishers who reported selling butchered green turtles reported a sale of 1,862 turtles per year (i.e. 75.8% of the total annual sale of green turtles reported), while the volume sold by the other 9 who reported how much they sold ranged from 8 to 150 turtles per year. Respondents reported that the average price for green turtle meat was around US\$2.07 and that the price was set by the fisher and rarely changed.

As with whole turtles, the majority of fishers (n=17) reported selling meat from their own home or at the home of a customer. Fishers also reported selling turtle meat on the street (n=7), to restaurants (n=7) and at the harbour (n=9). One of the older fishers said that he used to blow on a

Factors influencing the frequency of turtle fishing

Opportunity	Phases of the moon	Season	Weather	Demand	Time	Appetite	Pleasure
7	7	6	6	3	2	1	1

Table 4.11. Factors influencing the frequency of turtle fishing as reported by current and former turtle fishers in (n=28).

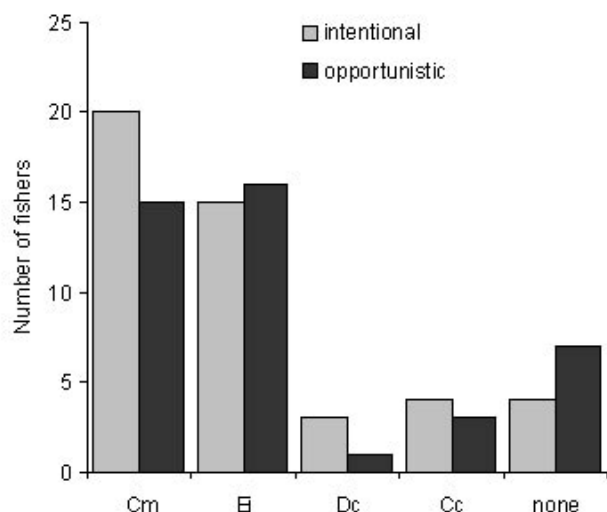


Figure 4.6. Intentional and opportunistic harvest of marine turtles in Anguilla.

conch shell to let the community know he had a catch (of fish and/or turtle) and then it was first come first served. From comments made by former turtle fishers it seems that, for most of them, the trade in turtle meat was local and driven by word of mouth. Fishers would bring turtles home to butcher them and customers would usually come to them. One fisher reported that there used to be a daily gathering in South Hill where people could buy turtle. Three of the respondents specifically stated that there was always enough demand on Anguilla and that they had never felt the need to look for a market elsewhere. However, some fishers did report selling to hotels (n=3), and at a market (n=2). Once again, the market referred to was in St Martin and the fisher who reported that he sold 1,000 butchered turtles each year sold his whole catch there or to restaurants in St Martin.

4.7.5.2. Sale of turtle meat by direct vendors

The TCOT SEQ identified 8 vendors who used to sell turtle meat including 5 restaurants, a supermarket and 2 hotels. Seven of these vendors reported starting to sell turtle products in the 1980s and 90s, corresponding with the tourism boom in Anguilla, and all reported stopping when the ban was introduced (1995). On average these businesses sold turtle products for 10 years. Fifty % of vendors cited the ban on use of turtle products as a reason they stopped selling turtle. Two vendors reported that they stopped selling turtle because they didn't like the idea of selling turtle and personally found the animals interesting. Another 2 said they believed turtle was something that tourists, particularly Americans, did not want to see on the menu. The supermarket owner owned his own turtle nets and his short-lived experiment in selling turtle meat outside the supermarket came to an end when his nets were destroyed by sharks – he had only been in business for one year and had only sold 7-8 turtles.

Vendors only reported selling green and hawksbill meat. One vendor reported selling turtle daily, while 2 sold turtle meat on a monthly basis and 2 only sold turtle a few times a year. Two vendors did not answer the question about how often they sold turtle meat. Four vendors (50%) had their meat delivered directly to them, 1 bought meat at the harbour and 1 from a fisher's home. Two of the vendors did not answer the question about where they bought turtle meat. Five of the 8 meat vendors reported that the fisher who sells the meat sets the price.

Seven vendors reported that they had noticed a change in the availability of turtle products for them to sell, the majority of these reporting that availability had decreased in the last 5 years and had either decreased or remained the same since they could remember. The main reason cited for the decrease in availability was the moratorium, but one vendor

	Number of fishers selling	Total annual sale reported	Green	Hawksbill	General (unspecified species)
Whole turtles	9	1,801 turtles	1,637	36	128
Butchered turtles	20	3,222 turtles	2,456	297	469

Table 4.12. Numbers of turtles of different species sold by fishermen in Anguilla.

said that there wasn't really a market anymore and one said that the supply of turtle meat has disappeared. None of the vendors reported any seasonal variation in sales volume, but 2 vendors indicated increased sales during carnival month (August) when people from other Caribbean islands, who are accustomed to turtle steak and stew, visit Anguilla and are keen to eat turtle meat. Anguillians who live abroad and return home for Carnival are also reported to want to eat turtle as it is a special dish.

Three factors were reported to influence how much was charged for turtle on the vendor's menus: purchase price, profit margins and current price trends. The average price charged for a serving of turtle was US\$13.12 (max US\$18, minUS\$7.46). One vendor reported that the sale of turtle was very important to his business, 5 that it was of little importance and 2 did not answer this question. When asked about changes in demand for turtle, 3 vendors said that the change had been in availability, not demand and that there was still a market for turtle meat in Anguilla. One vendor reported that people still ask for it and he tells them that it is banned and cannot be served. According to this respondent, in recent years more local people have asked about turtle meat, whereas in the past it was tourists, particularly from Europe, who were interested. Five vendors reported that local people were the main purchasers of turtle meat, while 2 said that more men bought it and 2 indicated that it was a favourite among European tourists. With the exception of 1 vendor who reported that residents in Anguilla disagreed with the sale of turtle products and 2 who reported that tourists disagreed, the general perception was that all customer groups (i.e. local people, naturalised residents, residents and tourists) either agreed with the sale of turtle products or had no opinion on the matter.

4.7.5.3. Consumption of turtle meat

The vast majority of respondents to the TCOT SEQ (n=62, 86.1%) said that they had eaten turtle meat in the past. Respondents enthusiastically shared recipes and pointed out herbs that used to be used to flavour turtle stew (Photo 4.18). One person said that he was still consuming turtle meat and a minority of the survey audience (n=8, 11.1%) reported that they had never consumed turtle meat. The reasons given for never consuming turtle products included conservation, personal choice and a lack of availability. Thirty-five (56.5%) respondents who used to consume meat and other products, but no longer did, gave the moratorium as the reason for stopping. In keeping with this, a majority of respondents (35) reported that they had stopped consuming turtle products in the 1990s.

Other reasons for stopping included religion (2), no longer fishing for turtle (2), conservation (15), turtle products being unavailable (8), dislike of turtle products (9) and no interest (1). Seven respondents said that they had only used turtle products "long ago" and 1 did not answer the question.

Forty-six of the consumers interviewed reported using turtle more than once a year (yearly, 14; monthly, 21; weekly, 10 and daily,1). Green turtle was clearly the preferred meat



Photo 4.18. "Stingin' Thyme", a favourite herb used to flavour turtle stew (Photo P. Richardson).

species with 31 (64%, n=46) of respondents citing this preference. Twelve respondents said they did not distinguish between species, 5 preferred hawksbill meat and 2 said they preferred loggerhead meat.

Only 19 of those who consumed meat on a regular basis reported purchasing the product. It was more common (27) for people who used turtle meat to either fish for it themselves or receive meat as a gift. Of those who did purchase meat, most (12) said that it was available all year round. The average price of turtle meat was reported to be US\$2.80/lb, with a maximum of US\$11.00 paid for a turtle dish in a restaurant, and a minimum price per lb reported to be US\$0.65. Twenty-three consumers also reported giving turtle meat away as a gift to friends, neighbours and family (green, 18; hawksbill, 13; no preference, 4). Of the 46 regular turtle consumers, only 4 made reference to the fact that turtle meat is a "strong" meat, believed to enhance virility and 1 said that it had medicinal properties.

Based on a calculation of how many times turtle was consumed in a year and how much constituted a meal, the 46 regular consumers interviewed reported that they used a total of about 759kg of turtle meat per year. Average consumption was around 23.7kg per household per year, the maximum reported was 141kg and the minimum 0.4kg. Respondents reported using between 2lbs and 6lbs of turtle meat per meal depending largely on the number of people in the household. While for many turtle meat was an occasional variation in the diet, it appears to have constituted a very important source of protein for some families.

4.7.6. Trade in shells and shell products

Little has been written about the volume of local trade in turtle shells and shell products in Anguilla. Meylan (1983) reported that carapaces of green and hawksbill turtles were dried and sold locally though there was no local handicraft in tortoiseshell. She observed the shells of 15 juvenile hawksbills and 1 sub-adult green turtle on sale at various places in Anguilla. In 1983, polished juvenile turtle carapaces were for sale at a shop in Sandy Ground, at the

airport and at a restaurant in Island Harbour (Richardson & Gumbs 1983). According to Meylan (1983) traders from St. Thomas (US Virgin Islands) and Puerto Rico are said to have periodically visited Anguilla to buy turtle shell. The price in 1980 was reported to be US\$20/kg. Furthermore, Anguillian fishers were reported to be selling hawksbill scutes and whole turtle shells to traders on St Martin where, in 1980, there was a dealer exporting shell from the Northern Leeward Islands to Holland. Despite offering US\$100/kg, he was only able to purchase half the amount of shell he had been able to in previous years (Meylan 1983). Years ago there are reports that some individuals from Japan came to Anguilla looking for shells (R. Hodge (DFMR) pers. comm. 2002). There have been no instances of prosecution due to international trade infringements.

4.7.6.1. Sale of shells and shell products by turtle fishers

Whole shells

Sixty-two % (13) of turtle fishers who sold turtle meat or shells, sold whole turtle shells. Three of these said that they only ever sold green turtle shells, while 3 sold green and hawksbill shells, and 7 answered for turtles in general and did not specify which species the shells they sold came from. The 6 fishers who sold whole green turtle shells reported a total annual sale of 2,717 shells. One fisher accounted for most of this annual sale, and reported having sold 2,000 whole green turtle shells to traders in Anguilla and in St Martin each year prior to the moratorium. Whole green turtle shells sold as decorative items for between US\$20 and US\$100 with an average price of US\$39.52. One fisher reported that whole green turtle shells were sold for the same price as meat (US\$2.24/lb), as people would cook up the shells along with the flesh for soups and stews.

Though whole hawksbill turtle shells were reported to be worth slightly more than green turtle shells (US\$20-US\$150), only 3 fishers said that they sold hawksbill shells. The reported annual sale of whole hawksbill shells was 105 shells. This is consistent with reports of a lower catch of hawksbill turtles in Anguilla compared to green turtles, but does not support reports that some fishers were specifically targeting hawksbills to fuel the trade in shells (Meylan 1983). The reported annual sale of whole hawksbill shells was 105 shells.

Of the 7 fishers who did not specify which species the shells they sold came from, none reported that they sold more than 20 shells per year. They reported a total annual sale of 52 shells that sold for an average price of US\$20.21. The price of whole shells was said to be constantly changing as prices were discussed between the buyer and seller and were influenced by the size, quality and species of turtle.

Eight fishers reported selling whole shells at points of sale consistent with a local market (on the street, at the harbour, at people's homes) and 8 reported selling them at places consistent with a tourist market (market in St Martin, restaurants, retail outlets, hotels), with most fishers catering

to both markets. All those who reported to be selling to retail outlets were selling to a well-known trader in North Hill Village. This trader was interviewed for the TCOT SEQ and details of his interview are discussed in 4.6.6.2 below.

Shell pieces (scutes)

Eleven fishers reported to have sold shell pieces, but only 9 provided any detail about this sale. Of these, 8 reported to have sold hawksbill scutes while 1 fisher said he sold the scutes from 75 green turtles each year for US\$2.99/lb, and 1 said he sold the scutes from 1 or 2 turtles of unspecified species each year for US\$3.73/lb. The annual reported sale of hawksbill scutes amounted to scutes from 207 turtles. Two fishers reported selling just a few pounds of scutes each year. Information about the price of hawksbill scutes is fragmentary. One fisher only sold scutes many years ago and reported receiving 2-3 shillings per pound. Prices reported from more recent years ranged from US\$0.65 to US\$15 per pound. One fisher reported selling worked items like bracelets and pendants that he would occasionally make out of hawksbill shells discarded by his father. He reported getting about US\$7.50 per item. Some scutes were sold locally, but the majority of sales were to traders from other Caribbean islands (St. Lucia, St. Kitts and Antigua), the local trader in North Hill Village or to a retail outlet known as "The Factory" in the Valley.

4.7.6.2. Sale of shells and shell products by direct vendors

The TCOT SEQ identified 9 direct vendors who used to sell turtle products, and only 1 of these regularly sold shells or shell products. From TCOT SEQ interviews, he appears to have been the only person dealing in any amount of shells and scutes. This respondent acted as a broker for shells



Photo 4.19. Whole green and hawksbill turtle shells on display in a restaurant (Photo P. Richardson).

and scutes that he would purchase directly from fishers. He purchased hawksbill scutes and whole green turtle shells on a monthly basis. Traders came to him from the Dominican Republic and bought whatever scutes he had accumulated from fishers since their last visit, and sold him items that had been made from scutes (e.g. pendants, bracelets and earrings) as well as a wide range of other souvenirs. During the 1980s, he said that he began to notice that tourists were no longer buying tortoiseshell items. He believed this was because it was no longer legal for them to take these products into their own countries. As a result of this decline in the market, he stopped buying from the Dominicans. The vendor reported that the Dominicans stopped coming to Anguilla altogether in the 80s when the government started taxing them. He has since closed his gift shop and no longer trades in any souvenirs or turtle shells, though he showed TCOT staff a few pieces of stock that were left over from his days in the souvenir business.

4.7.6.3. Consumption of turtle shell and shell products

All 72 respondents to the TCOT SEQ were asked if they had ever used shell or shell products. Forty-seven % of respondents (n=34) said that they had used whole shells and 23% (n=17) said that they had used worked shell or shell products. Though quite a large number of people owned or used whole shells, this does not appear to represent a flourishing local market as most shells and shell products seem to have been given rather than sold.

Whole shells

According to respondents, both green and hawksbill shells were used whole. Most whole shells were used decoratively in people's homes and were given or received as gifts. One respondent recalled that turtle shells were used as receptacles for feeding pigs. From the TCOT SEQ it appears that the local trade in whole shells was negligible. Only four people reported ever purchasing a whole turtle shell and only 2 of these could remember what they paid for the shells: one US\$70 and the other US\$22.50. Shells were purchased directly from fishers. Sixteen people said that they had given whole shells as gifts to others, mostly to friends and family (n=12), but also to tourists (n=4). The number of shells used was expressed either as a total or as a number used annually. Fifteen respondents reported the number of shells they had owned in a lifetime, which amounted to 50 shells. Four respondents said that they would use whole shells each year and this amounted to an annual number of 120 shells.

In general, people reported a decrease in the availability of shells in the past 5 years due to the moratorium. Slightly more people had noticed an increase immediately prior to the moratorium than those who reported to have noticed a decrease in the same period.

Shell products

Meylan (1983) reported that there was no real local handicraft in tortoiseshell in Anguilla and this is borne out by the findings of the TCOT. It appears that local use of shell products on Anguilla was limited to owning a home-made



Photo 4.20. A bucket of hawksbill scutes left in a fisher's back yard from a time when he used to sell to traders (Photo P. Richardson).

guitar pick, hair slide, ornament, or piece of jewellery that had been fashioned elsewhere. Whatever shell products were produced were derived from hawksbill turtles. Once again, only 4 people reported ever having purchased something made of turtle shell and only one of these remembered that he had paid US\$25 for a bracelet. Whereas whole shells seem to have been quite frequently gifted to others, only four people reported giving shell products to friends and family (n=3) or tourists (n=1) as gifts. In general, people reported a decrease in the availability of shell products in the past 5 years due to the moratorium. Slightly more people had noticed an increase immediately prior to the moratorium than those who reported to have noticed a decrease in the same period.

Recommendation

4.1.2.4. Recommendations regarding Multilateral Agreements

Gazette legislation to transpose CITES to domestic law.

4.7.7. Incidental catch in marine fisheries

One of the regulations introduced by Anguilla to limit by-catch, and linked to the moratorium on turtle fishing, is a ban on gill-net fishing. Currently, only beach seine nets are allowed on the island and fishers are only allowed to deploy nets when they see fish. In addition, nets can only be kept in the water for a limited time. Since most fishers are now working set gear such as lobster traps, it is believed that there is little accidental entanglement (R. Hodge (DFMR) pers. comm. 2002).

Prior to TCOT, reported incidences of accidental capture of turtles were limited. One of the fishers interviewed by Connor and Connor (1998) reported accidentally catching a turtle off Sombrero with a rod and line. On 2 occasions in 1998-1999, an experimental long line fishery project entangled leatherback turtles, which were released alive (MacAlister Elliot & Partners Ltd 2003; Weidner *et al.* 2001). Anguillian authorities have seized Taiwanese vessels that have illegally set long-lines in Anguilla's territorial waters, but there are no data available on turtle by catch incurred (O. Vanterpool (DFMR) pers. comm. (2002); Weidner *et al.* 2001).

Information from the TCOT SEQ generally seems to support the reports of limited incidental catch, however, there are a few issues that are worthy of note. Of the 39 fishers interviewed, 20 said that they had accidentally captured turtles while targeting other species. For the most part this was reported to happen only occasionally, however, 2 fishers reported frequently catching turtles in gear set for other species.

One was a fisher who used set nets to capture sharks and rays. The nets deployed for these species are virtually identical to turtle nets. He reported catching 3-4 green turtles in each net set – amounting to an accidental catch of hundreds of turtles each year. Most of these turtles were alive when captured and were released because of the moratorium. These nets have been illegal in Anguilla since the moratorium was first introduced in 1995, but it seems that this fisher at least has continued to use them. He said that he believed others also captured turtles accidentally, but did not wish to discuss this. The other fisher who reported a higher than average by-catch was using the legal beach seine nets used to catch jack. These are deep, small mesh nets that are set to encircle a school of fish and, according to this fisher, regularly capture turtles. Once again an accidental catch of hundreds of turtles each year was reported, and the fisher said that most turtles are captured alive and that they are released because of the moratorium. Both green and hawksbill turtles are caught in these nets. This fisher indicated that there used to only be a small number of people who could afford to fish for jack because of the high cost of beach seine nets. However, since other nets have been banned, more people have begun to use these nets and anyone using beach seine nets would catch turtles, which leads him to believe that turtle by-catch is on the increase in Anguilla.

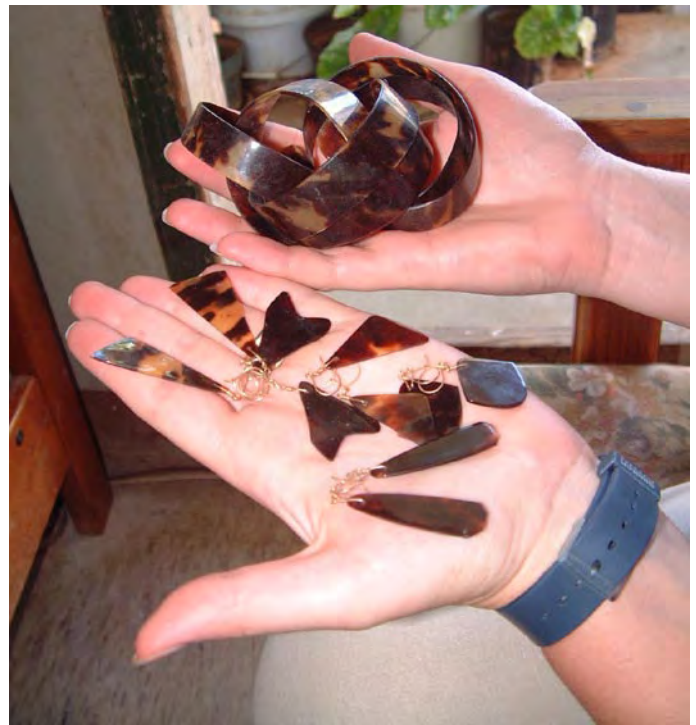


Photo 4.21. Tortoiseshell pieces bought from foreign traders and left over from a time when a vendor sold these items in a shop in Sandy Ground (Photo P. Richardson).

TCOT staff witnessed Anguillian fishers legally setting a seine net in Little Bay (see Photo 4.23), a designated marine park (see section 3 for details of legislation governing fishing in marine parks). This area has been identified as an important foraging site for green and hawksbill turtles. Though TCOT staff did not see the net being hauled, the fisher later reported to them that 2 green turtles and one hawksbill were caught and released on that occasion.

In addition to incidental capture in seine and set nets described above, the 18 fishers who reported occasional incidental catch reported turtles being caught or entangled in a variety of gear. Eight fishers reported turtles becoming entangled in the buoy ropes attached to their fish or lobster pots. Except for 1 hawksbill, all of these were leatherback turtles. Though leatherback meat is known to have been used in Anguilla, fishers would generally not take these animals either because of the moratorium, because they did not want the meat or because the animals were simply too big to handle. Five fishers reported small turtles, most often hawksbills, getting inside their fish traps and drowning as they were not able to escape. Two fishers reported catching turtles on a hook and line and one described accidentally spearing a turtle that was sheltering in a hole as he thought it was something else. In general it was reported that turtles were released if they were alive and used or sold if they were dead, but fresh. Turtles caught in fish traps would usually be inedible as traps are not checked daily, and would therefore be discarded. Some fishers specified that they would not use any turtle captured incidentally since the moratorium had been introduced, but timescale was not asked and it is therefore impossible to say whether the moratorium has impacted on the course of action fishers would choose.

4.8. Indirect Use

Indirect use of turtles in Anguilla has not developed in the same way as it has in some of the other OTs. Turtles appear on the currency (East Caribbean Dollar) and on T-shirts sold in souvenir shops, but do not have the ubiquitous presence they do in the Cayman Islands for example. The Anguilla National Trust (ANT) has expressed an interest in developing a tourism component like turtle watching, partly to see whether non-consumptive practices might curb egg collecting. To date the Trust has had only limited contact with the tourism industry through the sale of Turtle T-Shirts. This venture met with some success and there was a feeling that turtles could act as a good flagship species to attract tourists' attention to the marine environment and

bring much-needed funds into the Trust (Christian (ANT) pers. comm. 2002). Early on in the TCOT process, the Trust also expressed an interest in developing a volunteer driven turtle research programme in Anguilla (K.Hodge (Government of Anguilla) pers. comm. 2002). There have however been substantial staff changes since these issues were discussed and the ANT perspective on future use of turtles would need to be re-evaluated. There is however always significant public interest when people are aware of a nesting event (see Photo 4.28).The Anguilla Tourist Board (ATB) indicated that there is a move towards developing more tourism ventures with an environmental slant on the island, including things like turtle watching (Niles (Anguilla Tourist Board) pers. comm. 2002).

Information from the TCOT SEQ

We interviewed 17 indirect users of turtles and their use of turtles varied widely. Three primary areas of indirect turtle use were identified: using turtles as an advertising feature, using turtles as an attraction and having turtles as a feature of your professional activities. Multiple answers were allowed.

The most frequently cited reason for using turtles was because they are attractive to customers and this is a reflection of the fact that turtles are most often indirectly used as an attraction for foreign tourists. Tourists were said to be more likely to ask about turtles than local people and, on average, the majority of indirect users' customers are tourists. Information gathered from visitor exit surveys by the Anguilla Tourist Board in April 2004 indicates that only 2% of visitors engaged in SCUBA diving, while 13% went snorkelling while in Anguilla (www.gov.ai/statistics). The



Photo 4.22. Fishers setting a beach seine net in Crocus Bay (Photo S. Ranger).



Photo 4.23. Fishers bringing in a beach seine net in Crocus Bay (Photo P. Richardson).



Photo 4.24. Seine netting in Little Bay Marine Park (Photo S. Ranger).

Once in a lifetime	<10 in a lifetime	Rarely	2-4/year	Frequently
9	2	5	2	2

Table 4.13. Reasons given for no longer consuming turtle products.

TCOT SEQ indicates that there was a general perception that interest in turtles among foreign tourists was increasing. While an increase in interest among local people was recorded, one respondent indicated that whereas local people used to be interested in turtles from the viewpoint of eating them, they are now interested in conservation, highlighting that it is perhaps not the level of interest that has changed, but the focus of interest. The most frequently cited reason for a change in the level of interest in turtles was an increase in conservation awareness. Other reasons mentioned included the moratorium, the media, a desire to resume fishing and the perceived increase in the number of turtles. Two respondents gave the fact that people are no longer allowed to use turtles as the reason for a decrease in local interest in turtles.

Though indirect users involved in the tourist industry said that they used turtles to advertise their business and/or attract customers, only 3 believed that use of their services would decline if turtles were no longer found in Anguilla. However, nearly half the indirect users (47%, n=8) said that turtles were very important to their business and a further 5 (29.4%) said they were somewhat important. Ninety-four % of indirect users said that they believe turtles are economically important in Anguilla and 100% agreed that that some income from tourism should contribute to marine turtle conservation.

4.9. Attitudes to conservation

The TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine turtle management. Respondents could agree, disagree, or have no opinion. In some cases, they could choose 'not applicable'. While full details of responses to these questions are being analysed further, basic results are summarized here. The most common response is cited.

In general, most respondents agreed that:

- It is important that sea turtles exist in the wild in the future (95.8%)

- As turtles are migratory, they should be managed in cooperation with neighbouring states (91.7%)
- The government needs to actively work to protect sea turtles (84.7%)
- Turtles play an important ecological role in our natural environment (84.7%)
- Turtles should be protected, regardless of their use to humans (79.2%)
- Turtles are culturally valuable in this OT (76.4%)
- Turtles are economically valuable in Anguilla (73.6%)
- Some income from tourism should be used to support sea turtle conservation efforts (72.2%)
- Turtle fishing should be stopped until more is known about the size and health of the turtle populations (65.3%)



Photo 4.25. Anguillian currency, East Caribbean dollars, featuring a marine turtle.

Advertising	Attraction	Professional
<i>Turtles are used as a way of promoting goods or a service</i>	<i>Guests are told that they have a chance of seeing live turtles</i>	<i>Involvement in marine turtle research, conservation and education</i>
2 Boat operators	4 Boat Operators	3 Government employees
2 Dive Operators	3 Dive Operators	1 NGO
2 Gift Shops	2 Gift Shops	1 Teacher
	2 Restaurants*	
	*Tourists able to view live turtles at sea from the restaurant	
6 (35%)	11 (64.7%)	5 (29%)

Table 4.14. Summary of indirect use of turtles in Anguilla



Photo 4.26. Anguillian stamps featuring marine turtles.

- Existing laws protecting marine turtles are effectively enforced (63.9%)
- Government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (55.6%)
- Local people should be allowed to purchase sea turtle meat (55.6%)
- Local people should be allowed to catch and eat sea turtles, provided it does not harm the regional population (54.2%)
- Turtles should be used both as tourist attractions and as a source of food (51%)
- Turtles should be used as a tourist attraction rather than as a source of food (50%)
- Tourists should be allowed to purchase sea turtle meat (50%)



Photo 4.28. Staff at Cap Juluca, an exclusive hotel, enjoy the spectacle of a nesting leatherback turtle, May 2004 (Photo P. Richardson).



Most respondents disagreed with the following statements:

- Turtle fishing should be unregulated (68.1%)
- Turtle fishing should be stopped completely (54.2%)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (51.4%)

The results shown above suggest that there is a high level of support for general conservation statements (i.e. it is important that sea turtles exist in the wild in the future), and for a regional conservation approach. The local capture, consumption and sale of sea turtle meat is widely supported, but it is important to note that respondents frequently qualified their responses by saying that they agreed with certain statements, e.g. Local people should be allowed to purchase sea turtle meat, on the understanding that it was LEGAL to consume turtles. The support for consumptive exploitation should not be interpreted as defiance of the existing moratorium. Respondents agree that government has a critical role to play in turtle conservation and generally feel that they should be actively involved in turtle conservation. While many feel that the laws are effectively enforced in Anguilla, there was also a strong feeling expressed that the government could do more to ensure effective enforcement. This appears contradictory, but could reflect people's belief that Anguillians are generally compliant, but that there are still those who will break the law given the chance. While there is support for the continuation of a turtle fishery, this

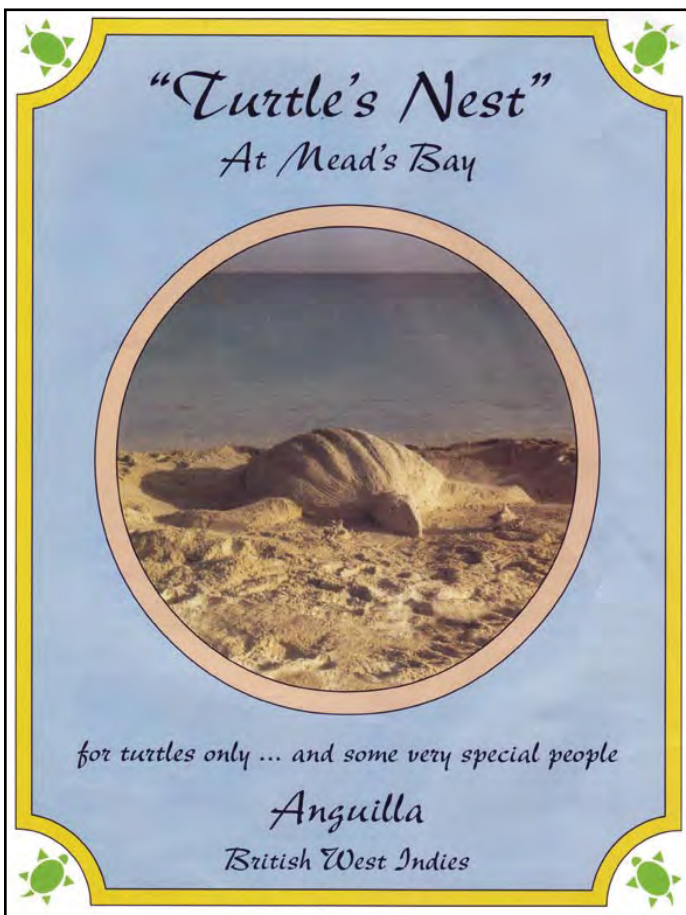


Photo 4.27. Brochure for beachfront accommodation called "Turtle's Nest" at Mead's Bay, Anguilla.

is coupled with strong support for regulation of the fishery. Views on whether or not tourists should be able to consume and/or buy turtle products vary depending on the product. Though there is general agreement that tourists should be allowed to purchase meat, people disagree with tourists taking shells home with them. Turtle fishers showed strong support for turtle fishing and for the rights of others to use turtle products. Fishers also showed opposition to indirect use of turtles as a tourist attraction taking precedence over consumptive use.

Due to the non-random sampling employed in this survey, interpreting the results of these opinion questions in particular should be done with caution, as respondents are not representative of the Anguillian population.

4.10. Capacity Building and Outreach Activities During TCOT

4.10.1. Capacity building

In September 2002, James Gumbs attended the TCOT training workshop in the Cayman Islands, having attended the Bermuda Turtle Project In-water course earlier that year.

With support from the Foreign and Commonwealth Office, Carlos Sasso was able to attend the Bermuda course in 2003. In addition, DFMR staff have been closely involved in all fieldwork carried out by TCOT staff. Therefore, the capacity of the DFMR staff to carry out marine turtle monitoring has been significantly improved through the TCOT project. TCOT staff were also instrumental in securing a grant from the British Chelonia Group for the construction of turtle nets.

At every opportunity, local fishers were involved in research activities and it is important to note that this area of local capacity building and local involvement proved very successful in Anguilla.

4.10.2. Outreach activities

Anguilla has been part of the generic dissemination outputs of the TCOT project (see section 12), and in collaboration with project partners TCOT was particularly successful in attaining a number of media outputs. TCOT staff have regularly appeared on Anguillian radio and in the local press and DFMR staff have also been featured following their participation in TCOT training initiatives.



Photo 4.29. TCOT and DFMR staff with fishers after successful sampling at Fish Hole Pond, Scrub Island in 2002 (Photo S.Ranger).

Recommendations

We make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

4.11. Acknowledgements

Firstly we thank the 72 individuals who gave up their time to answer the TCOT SEQ and who so generously shared their experiences and opinions. Their contribution is central to this report.

Throughout the planning and execution of this project, we have received nothing but support from everyone we have dealt with in Anguilla, but we would like to express our particular appreciation to a few people. Many thanks to the Acting Director at the Department of Fisheries and Marine Resources, Othlyn Vanterpool, for his personal interest, encouragement and willingness to make staff time available. We also thank the staff at DFMR: James, Carlos, Joslyn and Sharleen for their humour and countless hours spent beside, on or under the water in pursuit of turtles or information about turtles! Thanks also to the former Director of the DFMR, Roland Hodge, for introducing us to Anguilla, its cays and islands and its turtle fishing history and for all the time spent answering questions. We would also like to acknowledge the support the DFMR received from the British Chelonia Group to cover the cost of sampling nets. In his ever-changing guises Karim Hodge has been a constant support to the TCOT project from excavating nests to arranging CITES permits – our thanks to him for all his efforts. Thanks also to the Permanent Secretary to the Chief Minister, Mr. Rodney Rey, for his time and

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An Assessment of the Status and Exploitation of Marine Turtles in Bermuda





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

5. Status and Exploitation of Marine Turtles in Bermuda

Contents

	Page
5.1. Summary and Recommendations	79-80
5.2. Geographic Overview	81
5.3. Historical Overview	81
5.4. Organisations Involved with Marine Turtles in Bermuda	81
5.5. Status of Nesting Marine Turtles in Bermuda	81-83
5.6. Status of Foraging Marine Turtles in Bermuda	83-87
5.6.1. Data gathered from the TCOT socioeconomic questionnaire	83-84
5.6.2. Overview of the work of the Bermuda Turtle Project	84-87
5.6.3. Threats to marine turtles in Bermuda	88
5.7. Direct Use of Marine Turtles in Bermuda	89-91
5.7.1. Overview	89
5.7.2. Harvest of adults on the nesting beach	89
5.7.3. Harvest of eggs	89
5.7.4. Harvest at-sea	89-90
5.7.5. Trade in shells and shell products	90
5.7.6. Incidental catch in marine fisheries	90-91
5.8. Indirect Use	91-92
5.8.1. Turtle watching on beaches	91
5.8.2. Dive/snorkelling tourism	91
5.8.3. Aquaria holding captive turtles	92
5.8.4. Other marketing/cultural uses	92
5.9. Attitudes to Conservation	92-93
5.10. Capacity Building and Outreach Activities During TCOT	94
5.10.1. Capacity building	94
5.10.2. Outreach activities	94
5.11. Acknowledgements	95
5.12. References	95

5.1. Summary and Recommendations

Summary

The nesting marine turtle populations that once used the beaches of Bermuda are now extinct. Currently, large numbers of juvenile green turtles are found in Bermuda’s waters along with a smaller number of hawksbill turtles (see table 5.1.). Loggerheads and leatherbacks rarely visit Bermuda’s waters. There are historical records of Kemp’s ridleys from Bermuda, but none have been encountered in recent memory. A long-term green turtle monitoring project has been in operation in Bermuda for over 30 years and has produced valuable data on population structure, migrations, genetic identity and habitat use. Methodological variance over the three decades hinders interpretation of trend data on marine turtle abundance. Limited data regarding the perceptions of fishers and others subject to the TCOT socioeconomic questionnaire suggest that, although most species are generally perceived to have decreased in the long term, in the last 5 years the green turtle populations are generally perceived to have increased. Although formerly the site of a marine turtle fishery, turtles are no longer subject to direct harvest in Bermuda, although boat strikes, fatalities due to marine debris, incidental capture in marine fisheries and loss of sea grass habitat are considered threats to Bermuda’s sea turtles worthy of further investigation.

Summary of Recommendations

TCOT recommends that the Government of Bermuda continue to take all necessary steps to ensure the sustained existence of populations of marine turtles in Bermuda and facilitate their recovery. Bermuda appears to have lost its nesting populations, but still hosts significant foraging aggregations of juvenile turtles, especially green turtles. Although quantitative trend data are lacking, the general abundance and perceptions thereof by fishers and others in Bermuda seem to suggest that current management is resulting in a population increase of the green turtle. We make a number of specific recommendations under the following general headings:

5.1.1. Systematic monitoring of marine turtle populations to determine trends in abundance

- 5.1.1.1. Additional effort is expended on orienting in-water capture work of the BTP towards yield of CPUE data for green turtles.
- 5.1.1.2. Monitoring efforts on hawksbill turtles should be expanded.
- 5.1.1.3. Continued monitoring should be carried out at main potential nesting sites to ensure possible positive results of the past headstarting experiment do not go unnoticed.
- 5.1.1.4. Extend monitoring of possible impacts of bycatch and marine debris.

5.1.2. Increase capacity for marine turtle management

- 5.1.2.1. Ensure the Department of Environmental Protection has the long-term capacity, staff and resources to carry out all enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis.
- 5.1.2.2. Continue and increase the regional capacity building role of the BTP training course.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra’s Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	None since 1937	Juveniles present. Large numbers in some areas	Thought to be eliminated
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	None	Juveniles present Small numbers	Thought to be eliminated
Leatherback Turtle (<i>Dermochelys coriacea</i>)	None	Rarely encountered	None
Loggerhead Turtle (<i>Caretta caretta</i>)	One nest in 1990	Rarely encountered	None

Table 5.1. Marine turtle species present and summary of harvests in Bermuda.

of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific Recommendations

5.1.1. Systematic monitoring of marine turtle populations to determine trends in abundance

5.1.1.1. Additional effort is expended on orienting in-water capture work of the BTP towards yield of CPUE data for green turtles.

In recent years, more effort has been focused on generating data that can be used to assess temporal changes in marine turtle abundance in Bermuda's waters. These efforts have not yet been able to generate sufficient trend data to show whether the current management regime in Bermuda is successful. Recent changes in sampling strategy should be examined critically to ensure that these efforts will generate data of sufficient power to detect trends. An integral part of this work should be the continued monitoring and linkage to the health and distribution of seagrass beds.

5.1.1.2. Monitoring efforts on hawksbill turtles should be expanded.

Bermuda hosts a small population of hawksbill turtles. Data on size distribution, genetic identity, maturity status and spatial distribution have been collected by the BTP and BAMZ through incidental captures and through strandings. Hawksbills are rarely caught in the net used to capture green turtles. Since 2000, the BTP has dedicated annual sampling effort to swimming transects of suitable habitat with teams of snorkelers, capturing hawksbills by hand. This has proven to be a successful technique, but apparent low density of this species in Bermuda precludes large sample size for study, and has hindered evaluation of population trends.

5.1.1.3. Continued monitoring should be carried out at main potential nesting sites to ensure possible positive results of the past headstarting experiment do not go unnoticed.

It is still possible that individuals translocated to Bermuda could return to nest. It is important that at least some monitoring is carried out around likely candidate beaches to ensure this does not go unrecorded. Given that green turtles leave substantial tracks and pits and they typically nest at least three times over 1-2 months in a season, it is unlikely that nesting would go unnoticed if beaches were checked at intervals of 1-2 weeks in June-August (the likely peak nesting months).

5.1.1.4. Extend monitoring of possible impacts of bycatch and marine debris.

Other than boat strike, the main threats to marine turtles in Bermuda's waters appear to be bycatch in marine fisheries, including both local fishers and those on international vessels operating on the high seas, and fatalities due to encounters with non-degradable marine debris (ingestion

of plastics, entanglement in flotsam). These factors warrant further investigation.

5.1.2. Increase capacity for marine turtle management

5.1.2.1. Ensure the Department of Environmental Protection has the long-term capacity, staff and resources to carry out all enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis.

The staff of the Department of Environmental Protection carrying out the fieldwork of the Bermuda Turtle Project are well skilled in the field and data collection techniques needed for ongoing monitoring and research. However, although this initiative is relatively well resourced in comparison to many OTs, the BTP is reliant on outside donor and specialist scientific support. It is important for a long-term legacy of marine turtle monitoring and research that local ownership and co-management of data sets gathered with outside researchers are further developed to facilitate the enhancement of institutional memory and capability. This will insure against changes in capability of external workers to participate in the future.

5.1.2.2. Continue and Increase the Regional Capacity Building Role of the BTP Training Course.

The importance of this initiative in regional capacity building cannot be underestimated. It has been well utilised to date by TCOT partners (see section 11). Given the wide genetic origins of marine turtles in Bermudan waters, it is possible that positive benefits of Bermuda-based capacity building efforts could be detected in Bermuda in the future. Given the excellent track record of this initiative, additional external funding would be well deserved and is highly likely.



Figure 5.1. Map of Bermuda.

5.2. Geographic Overview

Bermuda (32°20'N, 64°45'W; Figure 5.1) is made up of approximately 180 limestone and coral islands and islets, 20 of which are inhabited. The eight largest islands - St George's Island, St David's Island, Bermuda Island, Somerset Island, Watford Island, Boaz Island, Ireland Island North, Ireland Island South - are connected by causeways and bridges. Total land area is 58.8 km² and the coastline is 150 km. The population is 64,900 (July 2004 est.), and per capita GDP is \$36,000 (2003 est.), the highest of the OTs. Tourism and international business are the main sectors of the economy. Over 500,000 tourists visit Bermuda each year, more than 80% of whom are from the USA.



Photo 5.1. Green turtle under X-ray at the Bermuda Aquarium Museum and Zoo Wildlife Rehabilitation Centre (Photo. J. Gray).

5.3. Historical Overview

Bermuda once had an assemblage of nesting as well as foraging green turtles. Murray (1991) gives the account of William Strachey, shipwrecked with other survivors in Bermuda in 1609:

"The tortoyse is a reasonable toothsam (some say) wholesome meat. I am sure our company liked the meate of them veerie well, and one Tortoyse would goe further amongst them, then three hogs. One Turtle (for so we called them) feated well a dozen Messes, appointing sixe to every Messe. It is such a kind of meat, as a man can neither absolutely call Fish nor Flesh, keeping most what in the water, and feeding upon Sea-grasse like a Heifer,

in the bottome of the Coves and Bayes, and laying their Egges (of which wee would find five hundred at a time in the opening of a shee turtle) in the Sand by the shoare side, and so covering them close leave them to the hatching of the Sunne, like the Manati at Saint Dominique, which made the Spanish Friars (at their first arrival) make some scruple to eate them on a Friday, because in colour and taste the flesh is like morsells of Veale."

However, despite seminal protective legislation adopted in 1620, by the end of the 1800s the green turtle nesting population was significantly reduced and Bermudian turtle boats are reported to have fished as far afield as the Bahamas or even Ascension Island (Parsons 1962). The law failed to halt the destruction of the breeding colony and there has been no recorded wild nesting of green turtles in Bermuda since the 1930s. By 1937 there was no laying at all on the main islands although it was felt there may still be some laying on outlying islets (Babcock 1938). The construction of the International Airport in the 1940's led to widespread destruction of the islets in Castle Harbour, which is thought to have further worsened the situation.

5.4. Organisations Involved with Marine Turtles in Bermuda

Green turtles have been the focus of a tagging study initiated in 1968 by Dr. H. C. Frick II, a trustee of the Caribbean Conservation Corporation (CCC) in collaboration with the Bermuda Government Department of Agriculture and Fisheries. One of the first scientific investigations of green turtles on their foraging grounds, The Bermuda Turtle Project (BTP) continues today as a joint effort of the Bermuda Aquarium, Museum and Zoo (BAMZ) and the CCC. Drs. Anne and Peter Meylan, research associates of the CCC and the Bermuda Aquarium, serve as scientific directors of the project, and Jennifer Gray of the Aquarium serves as Project Coordinator. The team is assisted by other staff members of Bermuda's Department of Conservation Services, in addition to local and international students and volunteers from the community. For a fuller overview of the BTP see Section 5.6.2.

The Bermuda Aquarium Museum and Zoo collects important data on sea turtle health and mortality through information gathered in their Wildlife Rehabilitation Centre (WRC) and the Bermuda Sea Turtle Stranding Network. Stranding statistics gathered in Bermuda are shared with the Sea Turtle Stranding and Salvage Network (STSSN) coordinated by the National Marine Fisheries Service in the USA.

5.5. Status of Nesting Marine Turtles in Bermuda

Between 1967 and 1977, an attempt to re-establish a nesting population in Bermuda saw over 25,000 green turtle eggs flown in from Costa Rica and Surinam and buried on local beaches. The majority were buried on Nonsuch Island and at Howard's Bay on Castle Point. 18,000 hatchlings emerged from these nests. Although, other headstarting

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	10	2	3	2	2
Leatherback	0	2	3	11	3
Loggerhead	1	6	1	9	2
Hawksbill	0	8	1	8	2

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	5	10	1	1	2
Leatherback	0	6	2	8	3
Loggerhead	0	10	0	7	2
Hawksbill	0	10	0	7	2

Table 5.2. Fisher perceptions of change in abundance of sea turtles in Bermuda waters over time (n=19 of 25 fishers who noticed changes).

projects around the world have received some level of success (see Mrosovsky in press for review), it may be that hatchlings deployed were either insufficient in number, had inappropriate sex ratios, or did not receive the behavioural cues that would allow re-establishment of a viable breeding population. It remains to be seen if the nesting population has been re-seeded.

In 1990, a loggerhead turtle nest with eggs was discovered on Clearwater Beach and was exposed by beach erosion. The clutch produced three healthy hatchlings. This was the first confirmed nesting of this species in Bermuda (Gray 1990a; 1990b). Given there has been no recorded nesting other than this one nest for over 5 decades, it is likely that all nesting populations of turtles that once used Bermuda are extirpated.

As in all TCOT countries, as part of the TCOT Socioeconomic Questionnaire (SEQ) respondents were asked about changes in numbers of nesting turtles over time. All respondents but one were aware that turtles do not nest in Bermuda. Some respondents were unsure whether or not there may have been nesters within their lifetimes, but all but one knew that there had been none in the last five years. Thus, awareness of the lack of marine turtle nesting activity among respondents was high.



Photo 5.2. Sport Diver Ron Porter captures a hawksbill turtle for the Bermuda Turtle Project (Photo: J. Gray).



Photo 5.3. Pelagic phase hawksbill turtles are encountered in Bermuda's waters (Photo: J. Gray).

Recommendation

5.1.1.3. Continued monitoring should be carried out at main potential nesting sites to ensure possible positive results of the past headstarting experiment do not go unnoticed.

It is still possible that individuals translocated to Bermuda could return to nest. It is important that at least some monitoring is carried out around likely candidate beaches to ensure this does not go unrecorded. Given that green turtles leave substantial tracks and pits and they typically nest at least three times over 1-2 months in a season, it is unlikely that nesting would go unnoticed if beaches were checked at intervals of 2 weeks in June-August (the likely peak nesting months).

of turtles had decreased since they started fishing. One believed turtles had increased in the last 5 years, and two responded that they didn't know (both had retired from fishing for almost 10 years). While these fishers were hesitant to comment on recent trends, their explanations for change suggest they view things positively. Reasons cited for changes in abundance were better management and laws protecting turtles. One fisher suggested overpopulation in Bermuda contributed to declines.

All questionnaire respondents were also asked about changes in numbers of turtles seen in territorial waters over time (in the last five years and since they can remember), both in general and for specific species (Q104). Results are presented for fishers in general, and then for the surveyed population as a whole. Of the 25 fishers interviewed, 19 commented on their perception of the patterns of turtle abundance over time. Their perceptions of change of individual species are shown in Table 5.2.

5.6. Status of Foraging Marine Turtles in Bermuda

5.6.1. Data gathered from the TCOT Socioeconomic Questionnaire (TCOT SEQ)

In-water turtle work was well developed in Bermuda before the instigation of TCOT and TCOT staff merely visited as guests of the Bermuda Turtle Project. BTP has been working extensively on foraging marine turtles for several decades (see below). BTP volunteer Jennifer Constable executed the TCOT SEQ in Bermuda and much useful information was gathered from fishers.

Fisher opinions on trends in turtle numbers were solicited in two separate questions on the TCOT SEQ. Q24 asked fishers about changes in abundance for all species they fish, in the last five years and since they started fishing. Five fishers were former turtle fishers, although one fished in Australia and one in Jamaica, so the responses of these two individuals regarding trends were excluded. All three who fished turtles in Bermuda believed that the number

The fishers gave little indication as to what they thought with regard to turtles in general, and rather commented on individual species. Of 15 who provided an opinion on green turtle abundance, 10 felt that green turtles had increased over the past five years, with 2 citing a decrease and 3 suggesting no change (2 fishers did not know and 2 did not respond for green turtles). In contrast, when comparing trends for as long as they could remember, 10 of 16 who provided an opinion felt that green turtles had decreased. Only one fisher contended that greens had decreased both in the short and long term. For leatherbacks, most fishers who commented felt that they had decreased in the long term, and decreased or stayed the same in the short term. The majority of fishers felt that loggerheads and hawksbills had decreased in the short and long term.

For the surveyed population as a whole, 37 respondents (52%) noticed a change in general, while 34 (48%) did not.

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	21	5	3	3	39
Leatherback	0	2	6	19	44
Loggerhead	1	8	5	16	41
Hawksbill	1	12	5	12	41

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	10	17	3	2	39
Leatherback	0	6	5	16	44
Loggerhead	0	12	4	14	41
Hawksbill	0	14	5	11	41

Table 5.3. Perceptions of change in abundance of sea turtle in Bermuda waters over time (n=71 respondents)



Photo 5.4. Collection ofturtle net (Photo: J.Gray).

Views of all respondents for specific species and in general are shown in table 5.3. In general, respondents who saw a change believed that turtles had increased over the past 5 years, but decreased since they could remember. However, perceived trends were different for some specific species. Leatherback, loggerhead and hawksbill turtles were believed to have decreased in the last 5 years and since respondents could remember. For green turtles, however, most respondents believed them to have increased in the last 5 year (n=21) rather than decreased (n=5). Over the longer time frame (since you can remember), most people believed green turtles had decreased (n=17), but many also believed they had increased (n=10).

Respondents were asked about reasons for the perceived increase or decrease in the number of turtles found in OT waters. Responses varied, but protection was the reason (n=8) cited most often as supporting increases with the only other reason cited being decreased fishing effort. Reasons for decreased numbers included: changing habitat, pollution, overpopulation, environmental pressure, hunting elsewhere, over-harvest, and increased consumption.



Photo 5.5. Capture of juvenile green turtle (Photo: J. Gray).



Photo 5.6. Loading of turtles onto research vessel (Photo: J. Gray).



Photo 5.7. Bermuda Turtle Project captures lined up in their beds on board the research vessel awaiting data collection (Photo: J. Gray).

5.6.1. Overviewing the work of the Bermuda Turtle Project

Peter Meylan, Anne Meylan and Jennifer Gray write:

Today, only immature green turtles and hawksbills inhabit the island's extensive shallow-water habitats. Greens and hawksbills arrive in Bermuda waters after having spent several years as post-hatchlings in the open ocean. They stay in Bermuda until they move on to an adult foraging ground where they will mature. Greens, leatherbacks, hawksbills, and loggerheads are sighted in the offshore Bermuda habitat. Here we outline the work of the BTP:

5.6.2.1. Project mission/description

The project's mission is to further the understanding of the biology of highly migratory, endangered marine turtles in order to promote their conservation in Bermuda and worldwide. The project provides what is arguably the best window on the post-pelagic, near-shore developmental stage of green turtles anywhere in the world. Turtles on Bermuda's extensive sea grass pastures are captured for study using a modification of the turtle fishing method that was historically employed in the Bermuda turtle fishery. A 2000-ft. entrapment net is set at study sites around the Bermuda Platform, and entangled turtles are removed by

teams of snorkelers and taken aboard a research vessel for study. Between 1992 and 2003, 448 sets were made with the net at 40 sites representing the various suitable marine habitats around Bermuda.

Sampling efforts between 1968 and 1991 were reported on a daily basis rather than by individual set numbers. As of December 2003, the Bermuda Turtle Project has collected data from 2,262 green turtles, approximately 100 hawksbills, and 43 loggerheads. Most of the green turtles were captured in the entrapment net, whereas the majority of hawksbills and loggerheads were obtained from recreational divers or as live or dead strandings. These records provide data on population structure and trends, genetic identity, sex ratios, growth rates, site fidelity, and migratory patterns. The project has made approximately 729 recaptures of its tagged green turtles in Bermudian waters, providing a large and robust data set on growth rates and movements of free-ranging, immature green turtles. Only two hawksbill recaptures have been made in Bermuda waters.

All turtles captured by the Bermuda Turtle Project are studied using a standardized protocol (Meylan *et al.* 1992; 1994; 1999; 2003). All are measured, weighed, and tagged. Each tag bears a unique number, a reward message and the return address of a tag clearing house at the University of Florida in Gainesville, Florida. Since 2001, turtles smaller than 35 cm in carapace length have also been tagged with an internal PIT tag. Blood samples are taken from each turtle for hormone assays that reveal the sex of the turtle by measuring the amount of testosterone in the blood. A separate blood sample or skin biopsy is preserved for DNA sequencing. Captured turtles are released at their initial capture site within an hour or two.

5.6.2.2. Population structure.

Green turtles captured by the Bermuda Turtle Project have varied in minimum straight carapace length at first observation from 22.3 to 81.0 cm (mean $\pm$ SD; 48.79 $\pm$ 12.61, n=1924) and in weight from 1.0 to 86.2 kg (20.27 $\pm$ 14.79, n =1927). Although a small number of the green turtles captured are larger than the minimum size at sexual maturity, laparoscopy of a sample of more than 100 individuals suggests that none are mature.

5.6.2.3. Population trends.

The capture method used by the Bermuda Turtle Project involves the setting of an entrapment net on sea grass beds at sites around Bermuda where green turtles are known to feed. Approximately 40 sites have been sampled over the course of the project, including a core group of sites representing various habitat types that has been routinely sampled throughout the 36-year project. From 1992 through 2003, this amounted to 448 sets, averaging 37 sets per year. Since 1992, the same net has been used for every set and the total number of turtles captured per set has been recorded providing a potential data set for catch-per-unit-effort (CPUE) analysis. However, there is a large amount of variance associated with the data. Some of it can be reduced by restricting the sample to data for the most

frequently sampled month (August, n=182 samples) and only the most frequently sampled sites. But other important sources of variation in the capture data remain, such as ambient conditions (time of day, sea state, current, turbidity, water temperature) and learning behaviour on the part of turtles (i.e., turtles that have been captured before may be more successful at evading the net). Unfortunately, we have little control over these variables.

Other variance is likely to be introduced by parameters associated with our netting protocol, such as the stealth used in approaching and initiating the set, exact placement of the net on the grass bed, the speed at which the net is deployed, degree and speed of closure of each set, and whether the lead line of the net remains on the bottom throughout the set. We are addressing these procedural sources of variation in several ways, including making



Photo 5.8. Blood sampling (Photo BTP).



Photo 5.9. Release of tagged turtle (Photo. J. Gray).

some uniform “blind” sets during each sampling session at net site locations that have enough “landmarks” that we can encompass approximately the same area of the sea grass bed each time. Although we currently employ a high-quality GPS unit, it is difficult to use it to set the net exactly in the same place each time. Another directive of the netting protocol for trend evaluation is that the net site is approached directly (not crossed) and the net is deployed upon arrival at a designated starting spot regardless of whether turtles are seen in the area. This is not always the case in other sets because we sometimes reconnoitre an area and delay setting until turtles are sighted, attempting to maximize the number of turtles captured (i.e., to get new tags put on, to recapture turtles for growth and movement studies) or targeting large animals for deployment of satellite transmitters. The specific methodology we have adopted for sets designed to yield trend data should begin to remove at least some of the causes of variation and provide a robust measure of trends in green turtle abundance in Bermuda.

5.6.2.4. Genetics.

For information on genetics of turtles in Bermuda waters see **section 10.5**

5.6.2.5. Developmental migration

Tag returns: Upon reaching a shell length of approximately 65-70 cm, green turtles depart from Bermuda and migrate to distant foraging grounds where they will complete their development and become sexually mature. External tags allow researchers to determine the locations of these distant foraging grounds. To date, 71 green turtles and one hawksbill tagged by the project in Bermuda have been recaptured in other countries in the western Atlantic, including Nicaragua, Panama, Colombia, Venezuela, Cuba, the Dominican Republic, Grenada, St. Lucia, and the United States. Over two-thirds of the green turtle recaptures have been made in Nicaragua, reflecting travel of approximately 2500 km in straight-line distance. We believe that the turtles take up residence on the extensive shallow grass beds off the coast of this country. This region is the primary source of mature adult green turtles in the western Caribbean. From this area, mature turtles undertake reproductive migrations to the nesting beach where they were born, completing a long and complex life cycle.

5.6.2.6. Satellite telemetry

The exact routes of migratory travel and other aspects of migratory and residential behaviour are studied using satellite telemetry. Small transmitters mounted on the backs of the turtles communicate with ARGOS satellites to provide BTP researchers with geographic coordinates, temperature, and diving behaviour. Five satellite transmitters have been deployed in Bermuda through 2003, four of which indicated only local movements around Bermuda. In the fifth experiment, a female green turtle given the name “Bermudiana,” travelled from Bermuda to the Dominican Republic and Haiti, and then on to the eastern tip of Cuba, where she was captured by fishers.



Photo 5.10. Release of turtle for satellite tracking (Photo: J. Gray).

5.6.2.7. Outputs

Publications resulting from the Bermuda Turtle Project, as well as publications about marine turtles in Bermuda, are listed in Appendix 11.5 as an integrated part of the TCOT Bibliography. Results of research conducted on marine turtles in Bermuda as part of the Bermuda Turtle Project are regularly presented at international symposia and at various regional meetings, including the International Symposia on Sea Turtle Biology and Conservation, the USFWS/NMFS Hawksbill Protocol Meeting in Miami, annual WIDECAST meetings, the CITES Wider Caribbean Hawksbill Turtle Dialogue Meetings, and the meeting on Population Models for the West Atlantic Green Turtle (Cayman Islands). Data from the Bermuda Turtle Project contributed to Bermuda's most recent State of the Environment Report, and they have been used to help make coastal and management decisions. Manuscripts on the importance of the Bermuda green turtle and hawksbill aggregations to the understanding of near-shore (neritic) developmental habitats and on the genetic composition of the Bermuda green turtle aggregation are close to submission.

5.6.2.8. Data management

Data generated by the Bermuda Turtle Project are maintained in a SAS 8.02 database on a server that is backed up daily with files stored at a remote location. The server is extensively guarded against viruses. Each individual turtle is assigned a Primary Tag Number under which all records are stored and accessed. Different types of records are coded according to observation type, including first observation, recapture, foreign recapture and stranding. All tags ever placed on an individual turtle are associated with the Primary Tag Number, including PIT tags. Spatial data are maintained in an ARCVIEW Geographic Information System to allow mapping and analysis. Data on all biological



Photo 5.11. The 2002 course attendees.

samples (blood, serum, tissues) are managed in Excel, as are foreign recapture records and set information. We hope to merge all current databases into a single Access database with several relational databases. This will avoid annual license fees associated with SAS and will make the data more accessible. Stranding data are maintained at the Bermuda Aquarium and are linked by Primary Tag Numbers in all cases where the turtles receive a tag and are released.

5.6.2.9. Conservation role

One of the most significant conservation contributions of the Bermuda Turtle Project is the International Course on the Biology and Conservation of Sea Turtles that is taught each year in conjunction with the summer sampling session. Over the eight years this course has been offered, it has served 87 students from countries bordering the Caribbean Sea and western Atlantic Ocean. These have included Anguilla, Belize, Bermuda, Bonaire, the British Virgin Islands, Canada, the Cayman Islands, Costa Rica, Cuba, Grenada, India, Jamaica, the Netherlands, Nicaragua, St. Lucia, the Turks and Caicos Islands, UK, USA and Venezuela. The course consists of lectures, discussions of assigned readings, two weeks of field experience capturing turtles and collecting data, and a hands-on anatomy session in which dead, stranded turtles recovered by the Aquarium through their stranding programme are examined. The course prepares students to establish or expand upon sea turtle monitoring and research programs in their home countries. Many of them return home and serve in decision-making positions in their governments where they are able to apply their conservation training. Most of the students in the 2003 course were funded by a grant from the U.K. Foreign and Commonwealth Office Environment Fund for the Overseas Territories.

The Bermuda Turtle Project plays a prominent role in Bermuda as a flagship programme of the Bermuda Aquarium. It is frequently featured in island magazines, newspapers, and film documentaries. The project's website <<http://www.cccturtle.org/bermuda/>>, hosted by CCC, received 69,727 page visits during 2003. Project Coordinator Jennifer Gray is a frequent speaker at schools around the island, as well as conservation and civic groups. An Educator's Guide about



Photo 5.12. Class in session (Photo P. Richardson).



Photo 5.13. Stomach contents of a juvenile hawksbill turtle that died from ingestion of plastic debris. BAMZ Sea Turtle Stranding and Salvage Network (Photo J. Gray).

Bermuda sea turtles was produced in collaboration with the CCC and distributed to Bermuda schools. Environmental education goals of the Bermuda Turtle Project are furthered by the involvement of volunteers in the programme. In 2003, 47 volunteers donated a total of 1962 hours of their time, and learned much about these endangered animals. The volunteers included international students, Friends of the Bermuda Aquarium interns, Bermuda Aquarium Museum and Zoo registered volunteers, and a number of professionals including lawyers, doctors, nurses and policemen from around the island.

Bermuda has a long history of commerce and population exchange with the countries of the Atlantic Basin. The sea turtles of Bermuda are a living symbol of this interconnection among peoples and cultures. In fact, the very survival of these endangered animals depends on international cooperation and stewardship.

End section by Meylan, Meylan and Gray

5.6.3. Threats to marine turtles in Bermuda waters

The main threats to marine turtles in Bermuda include incidental catch in fisheries, interaction with marine debris, boat strikes (see Section 5.7.6 below), and habitat loss (J. Gray (BAMZ) pers. comm. 2004).

Recommendations

5.1.1.1. Additional effort is expended on orienting in-water capture work of the BTP towards yield of CPUE data for green turtles.

In recent years, more effort has been focused on generating data that can be used to assess temporal changes in marine turtle abundance in Bermuda. These efforts have not yet been able to generate sufficient trend data to show whether the current management regime in Bermuda is successful. Recent changes in sampling strategy should be examined critically to ensure that these efforts will generate data of sufficient power to detect trends. An integral part of this work should be the continued monitoring of the health of seagrass beds.

5.1.1.2. Monitoring efforts on hawksbill turtles should be expanded.

Bermuda hosts a small population of hawksbill turtles. Data on size distribution, genetic identity maturity status and spatial distribution have been collected by the BTP and BAMZ through incidental captures and through strandings. Hawksbills are rarely caught in the net used to capture green turtles. Since 2000, the BTP has dedicated annual sampling effort to swimming transects of suitable habitat with teams of snorkelers, capturing hawksbills by hand. This has proven to be a successful technique, but apparent low density of this species in Bermuda precludes large sample size for study, and has hindered evaluation of population trends.

5.1.1.3. Extend monitoring of possible impacts of bycatch and marine debris.

Other than boat strike, the main threats to marine turtles in Bermuda's waters appear to be bycatch in marine fisheries, including both local fishers and those on international vessels operating on the high seas, and fatalities due to encounters with non-degradable marine debris (ingestion of plastics, entanglement in flotsam). These factors warrant further investigation.

Measures of direct exploitation	Past	Present	Never
By life stage			
Females on beaches	0	0	0
Eggs from beach	0	0	0
Turtles in water (intentional)	3 ¹	0	0
Turtles in water (incidental)	15		0
By product			
Meat			
Fishers who sell meat	0	0	0
Meat vendors	0	0	0
Meat consumers	20	0	0
Eggs***			
Collectors who sell eggs	0	0	0
Egg vendors consumers	0	0	0
Egg consumers	2 ²	0	0
Non-edible			
Fishers who sell shells	0	0	0
Shell vendors	0	0	0
Shell consumers	6	1	0
Measures of indirect exploitation			
Turtles indirectly used in business	1		
Total interviews	71		

Table 5.4. Numbers of exploiters per category, in the past and present. Notes: (1) A total of 5 fishers identified themselves as former turtle fishers. However, 2 of these fished turtles while resident in other countries, 1 in Australia and 1 in Jamaica. Therefore, they are excluded from this overview. (2) Two respondents identified themselves as former turtle egg collectors. However, 1 collected eggs while resident in the Philippines, and the other while in Australia. Thus, they are excluded from this overview.



Photo 5.14. Green turtle entangled in cargo netting, BAMZ Sea Turtle Stranding and Salvage Network (Photo J. Gray).

5.7. Direct Use of Marine Turtles in Bermuda

5.7.1. Overview

The degree of protective legislation afforded turtles in Bermuda has been progressive. The earliest known legislation protecting marine turtles was passed by the First Bermuda Assembly in 1620 and prohibited the taking of young turtles. The act protected all turtles of less than 18" breadth or diameter in any bay, harbour, sound or at sea to a distance of five leagues around the island. The penalty was 15lb of tobacco – half went to government and half to the informer. In 1937 there was a prohibition on taking turtles under 20lb. The Board of Trade (Fisheries) regulations (1947) enforced a restriction on the take of turtles during the month of June in any year. The Fisheries Regulations (1963) enforced a restriction on the take of any turtle of a weight smaller than 40lb. An order made under the Fisheries Act (1972) implemented a moratorium on the take of all turtles for a five year period. This moratorium was never lifted, but replaced with the Fisheries Protected Species order of 1978. To this end sea turtles in Bermuda have enjoyed complete protection from direct take since the act commenced on April 1, 1973.

Data on use of marine turtles in Bermuda were gathered by integrating published information, project partners, and using the TCOT Socioeconomic Questionnaire or SEQ (see Section 2; Appendix 2.1). In Bermuda, 71 questionnaires were completed and a breakdown of the number of interviewees and categories of exploitation gathered is digested in table 5.4, with a full digest of actual data gathered circulated to donors and local partners.

5.7.2. Harvest of nesting adults

Given the nesting population was extinct or a remnant by the 1930s, it is not surprising that no evidence of recent adult female exploitation was unearthed.

5.7.3. Harvest of eggs

Although no egg collection was recorded by any of the TCOT interviewees, 9 respondents reported egg harvesting by their parents and grandparents as continuing until the 1920s. Eggs were collected at various places around the Island.

5.7.4. Harvests of turtles at sea

In 1902 there were 8 boats commercially fishing turtles, but this had reduced to 2 boats by 1937 (Babcock 1938). By 1970, there were only a handful of part-time turtle fishers with a total recorded catch of 26 turtles, all green turtles (Rebel 1974). Legal turtle harvests in Bermuda continued until 1972 and former turtle fishers have been targeted as part of the TCOT SEQ to gain their insights. We interviewed three past turtle fishers, all over 65 years of age, and all retired, because of legislative change (n=2) and/or ill health (n=2). All three fishers preferred green turtles. Nets were used by all fishers, to catch both green and hawksbill turtles. No other methods were reported. The sizes of turtles reported captured are consistent with the small to medium sized juveniles found in Bermuda waters (around 50 lbs each), with low numbers (<30 per fisher) being captured per season. Turtle fishing, as suggested in the literature (Rebel 1974), appears not to have been a very important part of the economic activity in recent decades.

Although no fishers admitted to taking marine turtles in recent times, some interviewed as part of the TCOT SEQ suggested that turtles were still taken illegally, although through incidental rather than intentional capture (see section 5.7.6. below). Of 13 fishers who believed that other fishers catch turtles incidentally, 8 thought that some green turtles were kept. There have been no recent prosecutions for infringements of the laws governing turtle harvest, and members of the Bermuda Turtle Project were sceptical about these findings. They believe that if such illegal take occurs, it undoubtedly involves a very few turtles per year (J. Gray (BAMZ) pers. comm. 2004).

Awareness regarding Bermuda's Reef Preserves and Protected Areas is promoted in an attractive FCO funded leaflet (Appendix 5.1) that shows locations of protected areas and stipulates that line fishing, spear-fishing and lobster diving are prohibited. Contravening these laws carries a fine of up to \$5000 and/or imprisonment. Awareness of laws protecting turtles appears to be low. Fifty-three



Photo 5.15. Green turtle strangled by monofilament fishing line (Photo J. Gray).

respondents to the TCOT SEQ stated they were aware of laws regarding turtle fishing, and 23 said they were aware of laws regarding the purchase and sale of turtle products. However, only 6 and 4 individuals could provide examples of laws for fishing and purchase/sale respectively. Lack of awareness of specifics of the laws is likely a reflection of their lack of impact on individuals; as there is little to no demand for marine turtle products (see next paragraph), there is little incentive for people to know the specifics of laws restricting consumption.

Although there were no reports of current turtle product consumption, 20 respondents to the TCOT SEQ reported that they formerly consumed meat products. However, 14 of these had eaten turtle somewhere else, on holiday, infrequently (or only once), and one ate it more regularly while living in Indonesia. Five of the respondents consumed turtle meat in Bermuda, 4 regularly and one on holiday occasions, before it became illegal.



Photo 5.16. Turtle Warning Sign (Photo J. Constable).

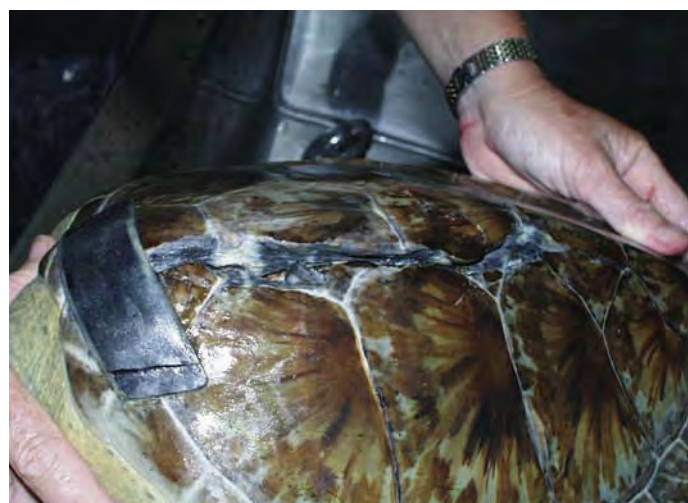


Photo 5.17. Green turtle carapace repair following boat strike, BAMZ Wildlife Rehabilitation Centre (Photo J. Gray).

5.7.5. Trade in shells and shell products

None of the fishers in the survey recorded selling whole shells or worked shell and no respondents reported current usage of such items in Bermuda. Three respondents reported using the whole shells, but only one of these while in Bermuda (an 86 year old man who stopped when it became illegal). Five respondents reported using worked shell; again, 3 of these used shell while outside of Bermuda, one used it in Bermuda (and is now opposed to such use), and the final respondent inherited tortoise shell items from her grandmother.

5.7.6. Incidental take

i) Incidental catch in marine fisheries

Ministry of Environment (2000) statistics suggest that in 1999, there were 213 registered commercial fishing vessels and 23 licensed charter-fishing vessels. These numbers appear to be relatively similar in recent years (J. Gray (BAMZ) pers. comm. 2004). The level of turtle by-catch by these fisheries has not been assessed, but is thought to be insignificant (J. Gray (BAMZ) pers. comm. 2004). A necropsy of a stranded loggerhead turtle in 2000 by the Bermuda Aquarium revealed a long-line hook embedded in the animal's oesophagus (J. Gray (BAMZ) pers. comm. 2004; Weidner *et al.* 2001). Presently there are only two local long-liners in active use. One fisher reports that they never incidentally caught a sea turtle, as they set at night with well weighted, fast sinking lines (J. Constable (BTP) pers. comm. 2004) It is thought that foreign registered long-liners operate in Bermuda's territorial waters, but as the local government lacks an enforcement vessel, pirate fishing can carry on with impunity.

In the TCOT SEQ, 15 (of 26) fishers recorded incidental take as part of marine fishing activities. The methodologies involved were net fishing for bait fish (n=8), using other nets (n=4), and using rod and hand lines (n=3). Most fishers indicated that these were unusual occurrences, once (n=12), twice (n=2) or three times per year (n=1). Most said turtles were alive when caught and that they were released. Under existing laws, these turtles should be reported to local Fisheries Authorities or the Bermuda Turtle Project, but there are few records of fishers doing this (J. Gray (BAMZ) pers. comm. 2004). The species most often captured were green turtles although loggerheads and hawksbills were also captured.

Year	Total Stranded	Entanglement	Ingestion of plastic	Boat Strike
1999	30	3	2	6
2000	30	1	1	2
2001	33	4	3	7
2002	23	2	3	1
2003	17	3	0	1

Table 5.5. Numbers of stranded turtles for each year 1999-2003 and the number where entanglement, ingestion of plastic and boat strike were thought to be primary cause of mortality. Data are provided courtesy of Jennifer Gray, Bermuda Turtle Project.

ii) Boat Strike

A more prevalent issue in Bermuda has been boat injury and death of turtles due to boat collisions in recent years. As of August 2004, there were 4,243 pleasure boats registered in Bermuda with 6,583 on file. This is an increase of 100 vessels since 2003. There are 5,170 registered moorings, which also represents an increase of 100 since 2003 (J. Gray (BAMZ) pers. comm. 2004). This has led to production of a "Turtle Alert" leaflet (Appendix 5.2) and the provision of sea turtle warning signs at 33 (22 installed 2004) known trouble spots. This is thought to have been beneficial in raising awareness and there may be modest signs that increased awareness is having the desired effect. There are many cases where cause of death cannot be confirmed even though boat collisions are suspected (e.g. boat collision can inflict damage on a floating corpse after the animal has died of other causes), and this must be borne in mind when interpreting the data in table 5.5. The incidence of boat strike is worth bearing in mind when considering the other OTs, where stranding networks do not operate. All of the OTs are highly dependent on tourism, much of it water based. As tourism continues to grow in the region, Bermuda's experience with its education program may inform education activities in other OTs.

iii) Entanglement and ingestion of marine debris

While boat strikes have been a threat and concern for more than a decade in these islands data suggest that entanglement in and ingestion of marine debris is increasing. Most entanglements involve monofilament fishing line left in the environment by local shoreline fishers. Ingestion of debris most often involves the consumption of small bits of weathered and broken plastic pieces and styrene pellets and occasionally involves ingestion of monofilament. The Marine Environmental Committee of the Bermuda National Trust has implemented a monofilament recycling programme and has installed receptacles at popular fishing spots around the island to encourage Bermudians to keep discarded fishing line out of the environment.

Recommendation

5.1.1.4. Extend monitoring of possible impacts of bycatch and marine debris.

Other than boat strike, the main threats to marine turtles in Bermuda's waters appear to be bycatch in marine fisheries, including both local fishers and those on international vessels operating on the high seas, and fatalities due to encounters with non-degradable marine debris (ingestion of plastics, entanglement in flotsam). These factors warrant further investigation.



Photo 5.18. Green turtle "Dick" on exhibit in the North Rock Exhibit at the BAMZ (Photo J. Gray).

5.8 Indirect Use

5.8.1. Turtle watching on beaches

Not applicable.

5.8.2. Dive tourism/snorkel tours

The dive tourism sector in Bermuda is significant, with some 6 dive operators and an estimated 15-20 000 dives per year. In informal discussions operators reported seeing them (hawksbills at the western breakers area and very rarely a leatherback) infrequently while diving. However, turtles were sighted regularly from the dive boat going to and from dive sites (M. Burke (Blue Water Divers) pers. comm. 2004). Dive operators approached by TCOT were interested in participating in Caribbean Turtlewatch, however, they pointed out that they rarely saw turtles on their dives. None were surveyed as part of the SEQ.

There are approx 25 boat cruise operators in Bermuda, but none of these highlight turtles in their advertising or in logos. Indeed turtles in Bermuda are very wary and it would be difficult if not impossible for a snorkel tour to get close enough to see them with any satisfaction.

Despite the fact that turtles are not advertised in tours, a large number of tour operators take visitors to turtle foraging grounds to enjoy sea turtles. One Helmet Diving operator visits such a site at the end of their dive to spend twenty minutes counting surfacing turtles with clients. The areas known as "Vixen" and "Fort St. Catherine" are visited daily, in season, by numerous tour operators who are specifically sharing the sea turtle experience with clients. One tour operator has a vessel named "*Chelonia*". Thus, while boat operators were not included in the TCOT SEQ sample, it is apparent that the sea turtles of Bermuda are highlighted in such tours. (J. Gray (BAMZ) pers. comm. 2004).

5.8.3. Aquaria Holding Captive Turtles

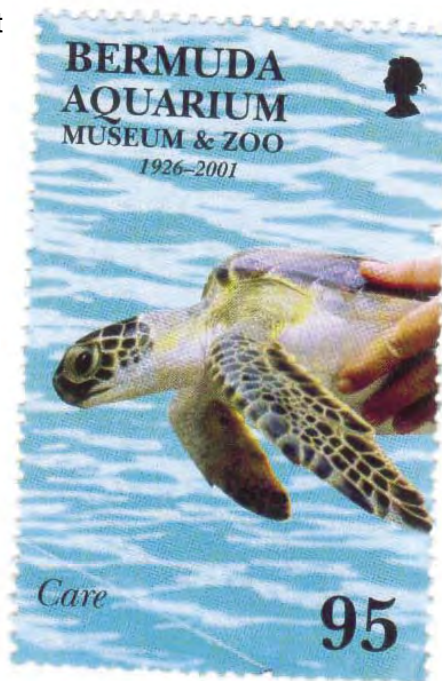
There are three places in Bermuda where green turtles are held in captivity.

1. BAMZ has eight accessioned green turtles in addition to a variable number of rehabilitating animals. Three of the accessioned turtles came from eggs laid by a Devil's Hole Aquarium female, which were translocated and hatched at BAMZ in 1988. One (MB534) was hatched on Nonsuch Island in 1972 after egg translocation from Costa Rica. Another (BP3577) was donated to BAMZ in 1987 and had been kept in a private pond for thirty years prior. The remaining three turtles are of unknown origin and have been captive at BAMZ in excess of four decades (Gray 1989). BAMZ has a large number of visitors (105,413 in 2001; (J. Gray (BAMZ) pers. comm. 2004).

2. Devil's Hole Aquarium is a smaller aquarium run in conjunction with a real estate firm, which shows 6 turtles. It is one of the oldest tourist attractions in Bermuda situated in a limestone sinkhole drowned by the post-glacial rise in sea level. The water is 35 feet deep and there are extensive underwater recesses and tidal connections to Harrington Sound. Ever since the 1880s it has been stocked with a variety of fish and turtles. In 1970 and again in 1971, there was mating and laying by the green turtles held, but, as there was no beach, the turtles laid in the water where the eggs sank to the bottom. In 1974-1975 an artificial beach was created (Wingate 1975). In 1976 there was a successful laying in Devil's Hole and the eggs were transferred to Nonsuch Island (Wingate 1976, 1977). No hatchlings resulted (Wingate 1977). Another clutch was laid on August 4, 1988, and the eggs were transferred to an artificial beach in the turtle enclosure at BAMZ. The eggs hatched on September 28th (60 days incubation). There were 58 hatchlings; 7 of these hatchlings were retained at the Aquarium. The remaining hatchlings were released at Church Bay, Southampton on September 29, 1988. Of the retained 7 turtles, 4 were returned to Devil's Hole Aquarium and 3 were retained at BAMZ. Presently, 1 hawksbill and 5 green turtles are on view at Devil's Hole. Devil's Hole suffered significant structural damage during Hurricane Fabian in September 2003. It is not known what its annual visitor numbers are, but they are undoubtedly considerably less than BAMZ.

3. Tom Moore's National Park has one large male green turtle and a second not yet identified smaller turtle in an inland saltwater pond known as Walsingham Pond. The origin of these animals is unclear. It was noted in 2003, by an employee of Tom Moore's Tavern, that the animals

were transferred from the restaurant's lobster holding crawl to the pond some seventeen years ago when the restaurant was renovated and the crawl removed. After Hurricane Fabian, there were no sightings of the turtles for 4 months and they were feared dead. However the large male was discovered in a cave in January 2004 – it was weighed and had not lost any weight. It has been returned to Walsingham Pond the second smaller turtle was sighted in July 2004 (J. Gray (BAMZ) pers. comm. 2004).



5.8.4. Other marketing/cultural uses

Weidner *et al.* (2001) state that *'there is considerable interest in turtles on Bermuda by the public and the environmental community'*. Perhaps surprisingly, despite the large foraging populations of marine turtles in Bermudan waters and its well-developed tourist industry, there are no companies that use turtles as a logo (See 5.8.2). Turtles have appeared on Bermuda postage stamps, and there is the one tour boat named *'Chelonia'*. Turtle orientated items are available in the gift shop of Bermuda Aquarium and Zoo, but are no more prevalent than at any other zoo or aquarium. In the

TCOT SEQ, nobody recorded using turtles to promote their business in Bermuda. As discussed in section 5.9 below, few TCOT SEQ respondents felt that turtles were culturally or economically valuable in Bermuda.

5.9. Attitudes to Conservation

The TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine turtle management which could be compared to opinions in other OT's. Respondents could agree, disagree, or have no opinion. In some cases, they could choose 'not applicable'. While full details of responses to these questions will be circulated to donors and local partners, basic results are summarized here. The most common response is cited. In general, most respondents agreed that:

- It is important that sea turtles exist in the future (94%)
- Turtles should be protected, regardless of their use to humans (85%)
- Turtles play an important ecological role in our natural environment (75%)
- As turtles are migratory, they should be managed in cooperation with neighbouring states (75%)
- The government needs to actively work to protect turtles (70%)
- Existing marine turtle laws are effectively enforced (66%)



Photo 5.19. Jennifer Gray (BTP/BAMZ) gives Bermuda Report at TCOT Workshop (Photo: S.Ranger).



Photo 5.20. Participants of the BTP International Field Course 2003 joined by Minister of the Environment; The Hon. Neletha D. Butterfield JP, MP (back row 5th from left) (Photo BTP).



Photo 5.21. Publicity for BTP in Cayman

Most people disagreed with the following statements:

- Turtle are economically valuable in this OT (94%)
- Turtles are culturally valuable in this OT (92%)
- The government needs to do more to ensure that existing laws protecting marine turtles are effectively enforced (48% disagreed, 25% agreed, and 27% had no opinion)

Opinions of respondents were almost equally split regarding the following statement:

- Some income from tourism should be used to support marine turtle conservation efforts (41% yes, 39% no)

As turtle fishing and consumption is illegal in Bermuda, most people deemed the following questions irrelevant (dominant agreement or disagree also shown in brackets):

- Turtle fishing should be unregulated (69% NA, and a further 31% disagreed with the statement)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (68% NA, but 5 people agreed with the statement, perhaps indicating their unfamiliarity with existing laws)
- Local people should be allowed to catch and eat sea turtle, provided it doesn't threaten the regional population (68% NA, but 14% agreed with this statement)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (65% NA, and a further 28% disagreed with the statement)
- Turtles should be used as both a tourist attraction and a source of food (65% NA, and a further 23% disagreed with the statement)
- Turtles should be used as a tourist attraction rather than as a source of food (63% NA, and a further 23% agreed with this statement)
- Local people should be allowed to purchase sea turtle meat (62% NA, and 21% disagreed with this statement)

The results indicate broad support for existing turtle conservation laws among respondents. There is satisfaction with existing law enforcement. Reflecting the lack of use of marine turtles in Bermuda (both direct and indirect), turtles were considered neither economically nor culturally valuable, by most respondents.

Cursory analysis of results by stakeholder group indicate that, while there are some areas of disagreement amongst stakeholders, these are few. For example, fishers as a group generally agree with the responses of the surveyed population as a whole. There is only one question for which the majority of fishers feel differently:

- Some income from tourism should be used to support sea turtle conservation (while surveyed population as a whole was split on this, most fishers disagreed with it).

5.10. Capacity Building and Outreach Activities During TCOT

5.10.1. Capacity building

There was little capacity building needed in Bermuda. Involvement of the BTP in the project did facilitate regional networking within the UK OT's as part of the TCOT Workshop in Grand Cayman and the BTP team were involved in the collaborative writing of a successful grant bid to HMG, which may increase chances of future success.

5.10.2. Outreach activities

Levels of awareness regarding the presence and status of turtles in Bermuda were high and there were no TCOT public awareness raising events as part of the 2 short visits to Bermuda by TCOT staff. The receipt of the FCO grant to fund the training of TCOT representatives from other OT's stimulated some press interest in Bermuda and abroad, leading to several media outputs which served to raise the local and international profile of the BTP.

Recommendations

5.1.2.1. Ensure the Department of Conservation Services has the long-term capacity, staff and resources to carry out all enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis.

The staff of Conservation Services carrying out the fieldwork of the Bermuda Turtle Project are well skilled in the field and data collection techniques needed for ongoing monitoring and research. However, although this initiative is relatively well resourced in comparison to many OT's, the BTP is reliant on outside donor and specialist scientific support. It is important for a long-term legacy of marine turtle monitoring and research that local ownership and co-management of data sets gathered with outside researchers are further developed to facilitate the enhancement of institutional memory and capability. This will insure against changes in capability of external workers to participate in the future.

5.2.1.2. Continue and Increase the Regional Capacity Building Role of the BTP Training Course.

The importance of this initiative in regional capacity building cannot be underestimated. It has been well utilised to date by TCOT partners (see section 11). Given the wide genetic origins of marine turtles in Bermudan waters, it is possible that positive benefits of Bermuda-based capacity building efforts could be detected in Bermuda in the future. Given the excellent track record of this initiative, additional external funding would be well deserved and is highly likely.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.



Photo. 5.22. Emblematic of Bermuda's commitment to sea turtle conservation is the involvement of Minister of the Environment, The Hon. Neletha D. Butterfield, JP, MP. (Photo BTP).



Photo 5.23. Community involvement in conservation is encouraged by the Bermuda Turtle Project. Rehabilitated hawksbill turtle “Sophie” with finder Sophie Farrow prior to release of the animal (Photo J. Gray).

5.11. Acknowledgements

The TCOT SEQ could not have been carried out without the commitment and hard work of volunteer, Jennifer Constable who also reviewed drafts of this chapter. The TCOT team would like to gratefully acknowledge the generous collaboration of Jennifer Gray, Anne Meylan, Peter Meylan and Jack Ward in the compilation and review of this chapter. We would like to additionally thank Jennifer Gray for her generosity in sharing her images. Brendan Godley would like to thank the Draycott family for their hospitality during his stay. Additional constructive review was offered by Nick Pilcher (IUCN-MTSG), James Abbott, Liz English Andrew Kesteloot, Zoe Meletis, and Jennifer Silver all assisted with TCOT SEQ under the supervision of Lisa Campbell.

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An Assessment of the Status and Exploitation of Marine Turtles in the British Virgin Islands





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

6. Status and Exploitation of Marine Turtles in the British Virgin Islands

Contents	Page
6.1. Summary and Recommendations	96-100
6.2. Geographic Overview	101
6.3. Historical Overview	101
6.4. Organisations Involved with Marine Turtles in the BVI	101-102
6.5. Status of Nesting Marine Turtles in the British Virgin Islands	102-106
6.5.1. Data from beach monitoring	102-103
6.5.2. Data from TCOT socio-economic questionnaire	103-104
6.5.3. Genetics	104-105
6.5.4. Threats	105-106
6.6. Status of Foraging Marine Turtles in the British Virgin Islands	106-111
6.6.1. In-water sampling around Tortola and nearby islands	106
6.6.2. In-water sampling at Anegada	107
6.6.3. Data gathered through Caribbean Turtlewatch	107-108
6.6.4. Information gathered from sailing community	108
6.6.5. Trends in abundance gathered from the TCOT SEQ	109-110
6.6.6. Genetics	110
6.6.7. Threats	110-111
6.7. Direct Use of Marine Turtles in the British Virgin Islands	112-118
6.7.1. Overview	112
6.7.2. Harvest of adults on the nesting beach	112-113
6.7.3. Harvest of eggs	113
6.7.4. Harvest at sea	113-116
6.7.5. Views of turtle fishers on regulation of the fishery	117
6.7.6. Trade in shells and shell products	117
6.7.7. Incidental catch in marine fisheries	117-118
6.8. Indirect Use of Marine Turtles in the British Virgin Islands	118-119
6.8.1. Turtle watching on beaches	118
6.8.2. Dive/snorkelling tourism	118-119
6.8.3. Aquaria holding captive turtles	119
6.8.4. Other marketing uses	119
6.8.5. Data from the TCOT socio-economic questionnaire	119
6.9. Attitudes to Conservation	119-121
6.10. Capacity Building and Outreach Activities During TCOT	121-122
6.10.1. Capacity building	121
6.10.2. Outreach activities	121-122
6.11. Acknowledgements	122-123
6.12. References	123

6.1. Summary and Recommendations

Summary

At least three species of marine turtle (leatherback, green and hawksbill turtles) nest in the British Virgin Islands (BVI) but in critically low numbers (see table 6.1). Although there may have been a modest recovery of some species in recent years, much needs to be done to ensure the continued existence of marine turtles nesting in the BVI and facilitate their recovery. Foraging marine turtles (generally green and hawksbill turtles) are widespread in BVI coastal waters of the BVI and, based on preliminary work carried out as a result of TCOT, appear to be locally abundant at some sites, despite having been subject to direct exploitation for a long period of time. Direct exploitation still occurs at levels much reduced from the recent past but we estimate that >150 green turtles and >50 hawksbills are likely taken per year in a directed fishing effort.

TCOT recommends that the Government of the British Virgin Islands takes all necessary steps to ensure the sustained existence of nesting and foraging populations of marine turtles in the BVI and facilitate their recovery.

This will require actions under the following headings:

6.1.1. Increasing the capacity for marine turtle management

6.1.1.1. Increasing the capacity of the BVI Conservation and Fisheries Department.

6.1.1.2. Establishing a multi-stakeholder marine turtle management process.

6.1.2. Amend legislation and policy to facilitate marine turtle population recovery

6.1.2.1. Revision of harvest legislation.

6.1.2.2. Strengthening BVI's marine protected areas system.

6.1.2.3. Planning policy and beach management.

6.1.2.4. Revision of MEA legislation.

6.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

6.1.3.1. Establish systematic monitoring efforts of nesting beaches.

6.1.3.2. Establish constant-effort in-water monitoring programmes.

6.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting British Virgin Islands to marine turtle conservation requirements

6.1.4.1. Encourage and implement sensitive practices at existing nesting beaches.

6.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the BVI.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific Recommendations

6.1.1. Increase capacity for marine turtle management in British Virgin Islands

TCOT has significantly contributed to the skills and technical knowledge of BVI Conservation and Fisheries Department (CFD) officers. However, their enforcement patrol, research and monitoring capacity is currently compromised due to a shortage of staff, equipment and a limited budget. It is essential that the CFD receives adequate resources to effectively carry out their custodianship of the BVI's highly valuable marine and coastal resources on which the country's economy so heavily depends.

To date there has been long-term dedicated marine turtle research in the BVI, yet no permanent decision-making process that involves all stakeholders. Marine turtle conservation and management in the BVI is of significant public interest, especially among certain sectors (fisheries, diving, sailing). It is essential that public compliance with marine turtle management measures continues and, to facilitate such compliance, it is necessary that stakeholders have meaningful input into a decision-making process.

6.1.1.1. Increase the capacity of the Conservation and Fisheries Department

- a) Ensure CFD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry and analysis for turtle monitoring programmes as part of their overall marine and coastal environment monitoring and research.

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	Small numbers Trend unknown	Adults & juveniles present Large numbers in some areas	Still present at reduced levels largely targeting foraging juveniles Probably low levels of egg harvest
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Small numbers Trend unknown	Adults & juveniles present Large numbers in some areas	Still present at reduced levels largely targeting foraging juveniles Probably low levels of egg harvest
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Small numbers Possibly increasing	Rarely encountered at sea	Almost eliminated Possibly very occasional egg harvest
Loggerhead Turtle (<i>Caretta caretta</i>)	Possible occasional nest	Occasionally encountered	Unlikely

Table 6.1. Marine turtle species present and summary of harvests in the BVI.

- b) Given the importance of all natural resources of Anegada, a priority for increased capacity would be a field-base (for visiting staff in addition to permanent personnel) and supporting infrastructure, including a research/enforcement vessel, based in Anegada.
- c) Ensure that all new research staff are adequately trained in marine turtle biology, as well as research and conservation techniques.

6.1.1.2. Establish a multi-stakeholder marine turtle management process

Identify and establish a Marine Biodiversity Working Group to promote the conservation of marine resources and include representatives of all interest groups and stakeholders (e.g. government agencies and departments such as CFD, BVI National Parks Trusts, Planning and Tourism; NGO's; hoteliers; dive operators; construction industry, fishers, H. Lavity Stoult Community College and interested members of public). The working group should meet regularly (ca. 4 times per year) to discuss and advise government (esp. CFD) on marine turtle management issues, paying particular attention to fisheries issues, habitat protection, possibilities for sourcing funding, further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation, and should seek external advice from appropriate experts. Some resources may be required to support stakeholder participation (e.g. travel expenses from other islands).

6.1.2. Amend legislation and policy to facilitate marine turtle population recovery

The legislation that currently regulates the harvest of marine turtles and their eggs in the BVI does not facilitate the sustained management of the country's nesting and foraging populations of marine turtles.

TCOT recognises that cessation of all marine turtle fishing would significantly contribute to the recovery of depleted turtle populations. TCOT also recognises that, although direct exploitation of marine turtles is no longer a major economic activity of many fishers, turtle meat is a component of the traditional BVI diet and trunk oil is highly valued. However, we recommend that any/all future harvest of turtles must be carried out in a highly regulated and controlled manner, with programmes in place to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured decreases in turtle stocks. Furthermore, if the CFD are responsible for the management of a future turtle fishery, it is vital that they have the human, technical and financial resources to effectively monitor the fishery and enforce supporting legislation.

TCOT recommends a number of legislative changes required to increase the likely sustainability of any harvest. In addition, it is noted that the regulation of use alone will not serve the sustainable management of turtles in the BVI. TCOT therefore also makes recommendations regarding legislation and policy changes to facilitate protection of critical marine turtle habitat in the BVI.

6.1.2.1. Harvest legislation recommendations

Although not monitored, the BVI turtle harvest is regulated by the Turtles Ordinance 1959 as amended in 1986 and the Fisheries Act 1997. This legislation is not comprehensively upheld or enforced, e.g. as evidenced by the high prevalence of turtle meat consumed at the Virgin Gorda Easter Festival during the designated closed season for the turtle fishery in 2004. We recommend a number of changes below. Any future harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in abundance in addition to adequate surveillance and enforcement.

In 2001, the Government of the BVI produced a draft document entitled *Fisheries Regulations, 2001*, which we were allowed to view. Sections 22, 26 and 27 dealt with regulations pertaining to the harvest of marine turtles and their eggs. Section 22 contained text that is contradictory to text in section 26 with respect to closed seasons for marine turtle harvest. Text in section 22 also contradicted the text of section 27 with respect to moratoria on the harvest of certain species of marine turtle. We felt that this needed reconsideration in order to become a more meaningful piece of legislation. The Regulations have now been gazetted, but we have not been able to obtain a final copy in time for final reporting. Based on the draft regulations, TCOT recommends the following amendments of the legislation to further facilitate sustainable harvest of BVI's foraging green and hawksbill turtles;

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.
- b) Consider a continued minimum size limit, as most fishers already accept this as a conservation measure. A suggested minimum would be 20lbs (9.07kg), with an equivalent minimum curved carapace length that should be stipulated in any amended legislation.
- c) Establish a limited turtle fishing licensing scheme, whereby especially licensed turtle fishers agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including compulsory reporting to and catch biometric measurement/sampling by the BVI CFD of all turtles caught in advance of slaughter. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes.
- d) Ensure prohibition of the harvest of loggerhead and leatherback turtles given their very low numbers in the BVI.
- e) Increase fines for infringements to a more punitive level in line with those recommended by other OTs.

6.1.2.2. Strengthen and enhance BVI's marine protected areas system

In order to preserve the marine biodiversity of the BVI, including marine turtles, it is recommended that the BVI marine parks are strengthened and extended. Current CFD-led monitoring of marine turtles will allow "hot spots" of marine turtle abundance to be defined and integrated within the BVI National Parks Trust (BVINPT) system plan for marine protected areas. From limited monitoring carried out to date it appears that the only important turtle nesting beach included in the National Parks Plan is Rogue's Bay, Tortola. Although coastal areas of Windlass Bight in Anegada are proposed for protection, this does not seem to be the most important area for turtle nesting in Anegada.

6.1.2.3. Amend planning policy and beach management

The nesting marine turtles of the BVI undoubtedly represent remnants of depleted populations and are at critically low levels. However, the adverse impacts of increased beachfront development on the nesting populations using the beaches of the BVI must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in the BVI, and therefore TCOT recommends the following:

- a) Ensure that key nesting habitats highlighted by ongoing CFD monitoring work are incorporated in the BVINPT systems plan and afforded protected status where no beachfront development will be permitted.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, disturbance of nesting turtles and erosion on all other nesting beaches.
- c) Under the guidance of the working group, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.

6.1.2.4. Revision of MEA legislation

The Endangered Animals and Plants Act, 1987 (Cap. 89) should be amended to prohibit commercial import and export of turtles and all wild turtle products of marine turtle species, so that this legislation fully transposes CITES to domestic law.

6.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

The BVI hosts nesting populations of green, hawksbill and leatherback turtles, and foraging populations of green and hawksbill turtles with occasional loggerhead turtles also reported. Trends in abundance will only be determined by long-term systematic monitoring. In order to understand the conservation status of these populations and inform effective conservation management, it is vital to work towards establishing data that will reveal any trends in their abundance. TCOT therefore recommends that the following monitoring programmes be established, under the guidance of the Marine Biodiversity Working Group, as a matter of priority:

6.1.3.1. Establish systematic monitoring efforts of nesting beaches

- a) Continue with ongoing leatherback nesting monitoring, increasing the level of ground-truthing and assessment of nesting success (the proportion of adult emergences that result in egg laying).
- b) Expand monitoring efforts to include hardshell turtle nesting sites.
- c) Establish a sustainable programme of morning nesting beach monitoring. This would include expanding the current aerial surveying protocol to ca. 2 flights per month throughout the nesting season to ensure

biodiversity managers are aware of the most important sites for marine turtle nesting. At key index beaches, ground surveys should be carried out on foot to determine nesting abundance trends, facilitate ground truthing of aerial surveys and to facilitate genetic analysis of nesting population through nest excavation and sampling. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the working group, into seasonal, revenue-generating tourist turtle walks in order to raise funds to sustain marine turtle management efforts.

6.1.3.2. Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes for both green and hawksbill turtles at a range of sites around the BVI, including Anegada

This would incorporate additional genetic sampling to facilitate the further determination of trends in genetic stock composition of green and hawksbill turtle populations. It should be noted that efforts should be focussed on yielding meaningful CPUE data although this may, at times, lead to a lower sampling rate per survey trip. Under the guidance of the Marine Biodiversity Working Group, steps should be taken to encourage the involvement of interested local fishers in all monitoring programmes and financial incentives should be considered so long as they fit within the remit of a sustainable programme.

6.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting British Virgin Islands to marine turtle conservation requirements

Increased awareness of turtles and their conservation requirements in the BVI can provide short and long-term mitigation against the threats faced by marine turtles due to development. TCOT recommends the following actions, to be implemented under the guidance of the Marine Biodiversity Working Group, to facilitate public contribution to marine turtle conservation:

6.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. A toll-free hotline may be of utility. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CFD has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to

sensitise Islanders to the importance of protecting the nests of such small nesting populations, and to encourage reporting of any illegal take of eggs or nesting females.

- d) Develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.
- e) Ensure school participation in any rookery monitoring programmes to sensitise children to the importance of rookery protection.

6.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the British Virgin Islands

- a) Raise awareness among BV Islanders of the presence of distinct foraging and nesting turtle populations through informational materials, web sites and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.
- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop BVI specific turtle related educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.



Figure 6.1. Map of the British Virgin Islands.

6.2. Geographic Overview

The British Virgin Islands (18°30'N, 64°30'W; Fig 6.1) consists of 36 islands, only 16 of which are inhabited. The major islands of this group are Tortola, Virgin Gorda, Anegada and Jost Van Dyke. The total land area of the islands is 150km² with a coastline of over 300km. The population currently stands at 22,187 (2004 est.) and the GDP per capita is \$16,000 (2002 est.) (CIA Factbook, www.cia.gov). The economy is highly dependant on tourism (Photo 6.1), which generates an estimated 45% of the national income, with around 350,000 tourists, most from the USA, visiting in 1998. BVI also has a thriving offshore finance industry.



Photo 6.1. Large cruise liners call into BVI regularly (Photo B. Godley).

6.3. Historical Overview

We found no historical sources referencing marine turtles and their exploitation prior to the twentieth century.

6.4. Organisations Involved with Marine Turtles in the British Virgin Islands

6.4.1. BVI Conservation and Fisheries Department

The primary organisation involved with marine turtles in the BVI is the BVI Conservation and Fisheries Department (CFD). This was formed by the amalgamation of the Fisheries Division of the Agriculture Department and the Conservation Office. It operates within the Ministry of Natural Resources and Labour and its functions as articulated in the BVI Government website <<http://dpu.gov.vg/Plans/NIDS/Environmentplanning.htm>> are: 1. Manage the Natural Resources of the BVI (Biodiversity Conservation and Endangered Species Monitoring, Environmental Planning and Development Monitoring, Environmental and Coastal Resources Monitoring, Legislation Surveillance and Enforcement, Pollution and Natural Disaster Preparedness and Response); 2. Educate the Public about Environmental Issues; 3. Acquire and Manage Information to assist in the Decision Making Process. CFD has a staff of 44, comprising 6 admin staff; 4 part-time beach wardens, 10

full time beach wardens, 8 management staff, 3 research staff; 3 enforcement staff and 10 other support staff. The overall operating budget estimate for 2004-2005 was US\$1,485,500 (S. Gore (CFD) pers. comm. 2004).

Involvement with marine turtle conservation and research has been extensive since a seminal leatherback monitoring programme was established in the 1980s (Photo 6.2), limited monitoring for hardshells in the early 1990's, extensive contribution to the WIDECAST network (Eckert *et al.* 1992) and, more recently, full support of the TCOT process and the Darwin Initiative Assessment of the Coastal Biodiversity of Anegada.

6.4.2. BVI National Parks Trust (BVINPT)

As articulated on the BVINPT website <<http://www.bvinationalparkstrust.org/>>. The BVINPT has a mission: *"To preserve and manage designated natural and cultural areas in order to improve the quality of life in the British Virgin Islands."* The Trust is further described as a Statutory Body, or a semi-governmental organization, operated by a Board of Directors appointed by Government. It receives an annual subvention from Government through the Ministry of Natural Resources and Labour. It has grown from a purely voluntary organization to a professionally-staffed operation with a complement of 27 employees. Its responsibilities have also substantially increased, from managing one National Park (Sage Mountain) in 1964, to managing 20 National Parks, including one marine park, today. Currently, the total area of land managed as national parks is 1079 acres (2.8% of the BVI land area) whereas 810 acres are included in the marine park. The total proposed MPA network of substantially expanded areas would be 99,319 acres or 0.49% of the total BVI marine area. The recently acquired OTEP project funding will seek to assess the representativeness of the marine resources contained within this expanded MPA system and be utilised to amend the proposed MPA network as needed. The NPT moorings programme has sought to protect the marine habitat, traditionally of coral reef areas, using the Halas mooring system, but seagrass areas are recognised as an equally



Photo 6.2. CFD staff with a nesting leatherback (Photo CFD).

important habitat, particularly for marine turtles. The NPT is currently expanding its mooring system to use sand screws that can be used within seagrass habitats.

BVINPT typically see marine turtle affairs as falling under the aegis of Conservation and Fisheries Department, but staff contribute to general environmental education, the Trust has an active moorings/reef protection programme and is one of the key partners in the Darwin Initiative Assessment of the Coastal Biodiversity of Anegada, of which sea turtles are a key element.

6.4.3. H. Lavity Stoutt Community College (HLSCC)

Although primarily a teaching institution, there are a number of trained biologists on staff who are actively involved in biodiversity research and environmental awareness-raising initiatives in the BVI. These include active involvement in the Tortola-based leatherback rookery monitoring programme, lead by CFD and HLSCC's partnership in the Darwin Initiative Assessment of the Coastal Biodiversity of Anegada.

6.5. Status of Nesting Marine Turtles in the British Virgin Islands

6.5.1. Data from beach monitoring

Leatherback turtles

To summarise the status of leatherback turtle monitoring in the BVI, Hastings (2003) is quoted below with additional more recent data added. A full copy of this article can be accessed with figures at <<http://www.seaturtle.org/mtn/archives/mtn99/mtn99p5.shtml>>:

"Since 1988, the Conservation and Fisheries Department of the BVI Government and dedicated volunteers, have conducted annual monitoring surveys of trunk nesting beaches. The main aim has been to determine the size of the remnant population, which has survived many years of harvesting and egg poaching. Moreover, the presence of Government officers was intended to help deter illegal taking of turtles.

Prior to 1994, monitoring surveys were limited to the retrospective assessment of tracks and other signs of egg laying following the departure of the female (see Cambers & Lima 1989; Hastings 1991; Morris 1990). Since 1994, additional staff has made it possible to increase efforts to locate and tag females, and to quantify and add new dimensions to education, public awareness and promotion of the tourism potential of remaining populations of sea turtles. Logistics dictate that daytime monitoring of nesting activities by a network of volunteers is still the most efficient means to collect the majority of data, but, since 2000, every attempt has been made to locate nesting turtles during beach patrols mounted most nights of the nesting season. More comprehensive nocturnal monitoring is hindered by the difficult terrain leading to many important nesting beaches, the large number of beaches to cover,

and, perhaps most importantly, the low frequency of nesting activity, which quickly dampens the enthusiasm of volunteers. Notwithstanding, nightly patrols are carried out at Long Bay Lambert, Little Bay Lambert and Josiah's Bay from March to August.

It is very clear that, although the trunk nesting population in the BVI is dangerously small, it appears to be on the increase. From a low of three reported nesting activities in 1990, numbers have increased fairly steadily to an all time high of 63 verified nesting activities in 2001 (Editors note: 47, 65, and 39 in each of 2002-2004 respectively; S. Gore (CFD) pers. comm. 2004). This is a remarkable turnaround in a few years. With increasing numbers it has been possible for turtles to be tagged and identified as individuals. Of these, one had previously nested in Culebra, Puerto Rico, and five have been encountered nesting in the BVI in more than one season (Photo 6.3).



Photo 6.3. Leatherback descends to sea (Photo BVI CFD).

Although numerous factors may be responsible, changes in local legislation, in concert with increasing law enforcement, have certainly had a positive effect. The trunking tradition was curtailed with the introduction of the revised Turtle Act of 1986, which made it illegal to take turtles except during an annual period of 1 December to 31 March. The Act largely eliminated the legal trunk harvest, as most trunks nest from April to June in the BVI. However, demand for trunk oil remains high, and trunkers continually ask for exemptions to catch a turtle, but very few trunk turtles have been killed in recent years. We are aware of one successful killing in 1996 and one aborted attempt in 1999. Meanwhile, despite enforcement efforts, poaching of the eggs continues to occur sporadically."

Hardshell turtles

The first scientific surveying to assess turtle nesting in the BVI was carried out in July 1981 for Western Atlantic Turtle Symposium (WATS) by Fletemeyer (1984). In conjunction with limited ground truthing and interviews with local people, rough estimates of the number of females in the annual nesting populations were given as:



Photo 6.4. Bill Bailey with green turtle nest, Anegada (Photo B. Godley).

Green:	75± 25
Hawksbill:	50± 25
Leatherback:	2
Loggerhead:	few and infrequent

Surveying for hardshelled marine turtles resumed in the 1990s with a network of volunteers activated to survey by foot (Hastings 1991; 1992). In 1990, between 21 August and 22 October, 1 green turtle nest (Prickly Pear), 4 hawksbill turtle nests (Virgin Gorda, 1 Tortola), and 1 nest of unknown species (Scrub Island) were recorded. In 1991, between 1 September and 25 November, 1 green turtle nest (Tortola), 14 hawksbill turtle nests (9 Scrub Island, 4 Tortola, 1 Jost Van Dyke) and 2 nests of unknown species (Little Camanoe) were recorded. Green turtle nests were recorded in September only. Hawksbill turtle nests were recorded between August and November.

In the interim period, occasional nests have been reported by interested members of the public, highlighting the potential for an organised re-activation of the once extant volunteer network in line with recommendations below. This has also allowed collection of a small number of genetics vouchers from hatchling turtles (see section 10.6.).

As part of TCOT fieldwork, in collaboration with local conservationist, Bill Bailey, CFD and MTRG staff recorded nesting of green (Photo 6.4) and hawksbill turtles on Anegada in August 2002. This led to a chain of events that resulted in the successful application to the Darwin Initiative for the Assessment of the Coastal Biodiversity of Anegada <<http://www.seaturtle.org/mtrg/projects/anegada/>>. As part of this project, systematic surveys are being made of

Anegada's beaches by foot in 2004. Data to date include a total of 5 green turtle nests and 6 hawksbill turtle nests in July. Although hosting small numbers of nests, Anegada is undoubtedly very important for marine turtle nesting in the BVI, with nesting being recorded between Windlass Bight and East End.

To augment these data, intermittent flights across the whole archipelago are being carried out with the support of the Royal British Virgin Islands Police aircraft. This included a complete survey of Anegada, Necker, Prickly Pear, Eustatia, Virgin Gorda, Ginger, Peter, Norman, Jost Van Dyke, Sandy Cay, Sandy Spit, Tortola, Guana, Little Camanoe, Great Camanoe, Scrub and Beef Islands. To date three flights have been made (25 May 04, 15 June 04, 14 July 04). No activities were recorded on the first flight, 2 leatherback activities were recorded on Tortola on the second flight and 3 leatherback activities were recorded on Tortola on the third flight. On this third flight, an additional seven activities of green and hawksbill turtles were recorded on Anegada, which were subsequently confirmed through ground-truthing surveys.

6.5.2. Data from TCOT socio-economic questionnaire

As part of the TCOT SEQ, 4 former egg collectors (one of whom also used to capture turtles on the nesting beaches) commented on the changing abundance of marine turtles nesting in BVI (Q105a-c). Their views on changing abundance by species are summarized in table 6.2. Although these data represent very few respondents, it is worth noting that most respondents suggest that abundance has decreased in the last 5 years, while it has or stayed the same since they can remember (only one respondent cites an increase, for leatherbacks in the last 5 years, while 2 respondents cite a decrease since they can remember for leatherbacks and hawksbills).

All questionnaire respondents were also asked about changes in nesting numbers over time (in the last five years and since they can remember), both in general and for specific species (Q105a-c). Fourteen respondents noticed



Photo 6.5. Genetics sampling, Tortola (Photo B. Godley).

In the last 5 years...					
	Increasing	Decreasing	Same	Don't know	NR
Green	0	1	0	0	3
Leatherback	1	1	0	0	2
Hawksbill	0	2	0	1	1
General	0	0	1	0	3

Since you can remember...					
	Increasing	Decreasing	Same	Don't know	NR
Green	0	0	1	0	3
Leatherback	0	1	1	1	1
Hawksbill	0	1	1	1	1
General	0	0	1	0	3

Table 6.2. Perceptions of changing abundance (by species) in the last 5 years, and since you can remember (n=4 former egg collectors. NR-not recall).

change, and 42 did not. For those who did notice change, for each species (except the leatherback) and in general, more people believed turtle nesting was decreasing or stayed the same versus increasing, in the past five years and since they can remember. Alternatively, most people believe leatherback nesting has increased over both time periods. (The perception of increased leatherback nesting may be a result of publicity received by the leatherback monitoring efforts). Perceptions of species decline and increases are summarised in table 6.3 below.

6.5.3. Genetics

TCOT genetic analyses (Photo 6.5) has shown that the haplotypes of nesting samples collected in the BVI have also been described in a number of other nesting sites and foraging areas (see section 10.4.3).

For wild green turtles no genetics vouchers have yet been collected.

For hawksbill turtles haplotypes described in nesting turtles/hatchlings from BVI have been described from

In the last 5 years...						
	Increasing	Decreasing	Same	Don't know	NR	NA
Green	1	2	1	1	6	3
Leatherback	6	2	0	1	3	2
Loggerhead	0	0	1	0	8	5
Hawksbill	2	4	2	1	2	3
General	0	3	2	0	7	2

Since you can remember...						
	Increasing	Decreasing	Same	Don't know	NR	NA
Green	1	3	2	1	4	3
Leatherback	5	2	1	1	3	2
Loggerhead	0	0	1	0	9	4
Hawksbill	2	3	3	1	2	3
General	0	2	2	0	8	2

Table 6.3. Perceptions of changing abundance (by species) in the last 5 years, and since you can remember (n=14 respondents who noticed change: NR- not recall, NA-not applicable).

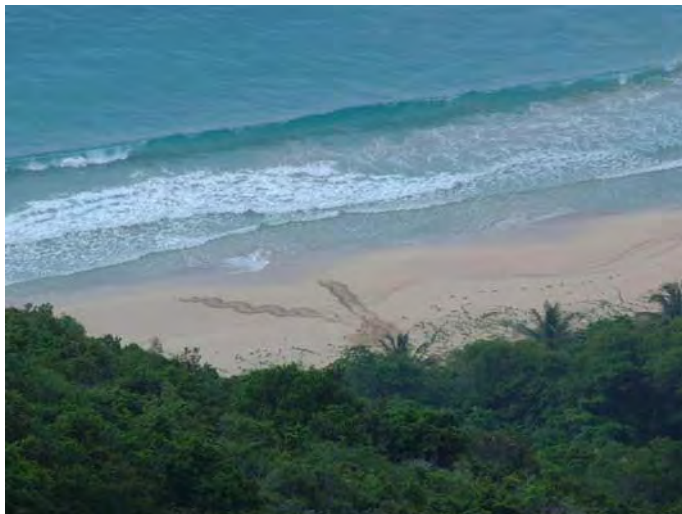


Photo 6.6. Trunk Bay, key nesting site for leatherbacks but currently subject to development plans (Photo P. Richardson).

foraging grounds in Anguilla, BVI, Cayman Islands, Cuba, Mexico, Puerto Rico, TCI. These haplotypes have also been described from **nesting** aggregations in Belize, BVI, Cuba, Puerto Rico and USVI.

It should be noted however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004 and more definitive answers will be available at that point. Despite the small size of the nesting populations in the BVI and the limited sampling to date (n=2), a previously undescribed haplotype was described for hawksbill turtles, highlighting the potential that the small remnant population in the BVI may be unique. More definitive answers will be available at that point. Data will be disseminated as part of a cross-territory FCO Overseas Territories Environment Programme (OTEP) funded project, which will focus on turtle Conservation, the Environment Charter and Multilateral Environment Agreements.

6.5.4. Threats

The threats to nesting turtles as outlined by CFD (S. Gore. (CFD) pers. comm. 2004) include:

1. Occasional illegal take of nesting females and/or eggs.
2. By catch in marine fisheries.
3. Loss of beach habitat due to erosion and sand mining.
4. Problems related to increased development at nesting beaches such as anthropogenic lighting (Photo 6.6).
5. Pollution, including marine borne litter on beaches, particularly on Anegada.

Recommendations

6.1.3.1. Establish systematic monitoring efforts of nesting beaches

- a) Continue with ongoing leatherback nesting monitoring, increasing the level of ground-truthing and assessment of nesting success (the proportion of adult emergences that result in egg laying).
- b) Expand monitoring efforts to include hardshell turtle nesting sites.
- c) Establish a sustainable programme of morning nesting beach monitoring. This would include expanding the current aerial surveying protocol to ca. 2 flights per month throughout the nesting season to ensure biodiversity managers are aware of the most important sites for marine turtle nesting. At key index beaches, ground surveys should be carried out on foot to determine nesting abundance trends, facilitate ground truthing of aerial surveys and to facilitate genetic analysis of nesting population through nest excavation and sampling. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the working group, into seasonal, revenue-generating tourist turtle walks in order to raise funds to sustain marine turtle management efforts.

6.1.2.2. Strengthen and enhance BVI's marine protected areas system

In order to preserve the marine biodiversity of the BVI, including marine turtles, it is recommended that the BVI marine parks are strengthened and extended. Current CFD-led monitoring of marine turtles will allow "hot spots" of marine turtle abundance to be defined and integrated within the BVI National Parks Trust (BVINPT) system plan for marine protected areas. From limited monitoring carried out to date it appears that the only important turtle nesting beach included in the National Parks Plan is Rogue's Bay, Tortola. Although coastal areas of Windlass Bight in Anegada are proposed for protection, this does not seem to be the most important area for turtle nesting in Anegada.

6.1.2.3. Amend planning policy and beach management

The nesting marine turtles of the BVI undoubtedly represent remnants of depleted populations and are at critically low levels. However, the adverse impacts of increased beachfront development on the nesting populations using the beaches of the BVI must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in BVI, and therefore TCOT recommends the following:

- a) Ensure that key nesting habitats highlighted by ongoing CFD monitoring work are incorporated in the BVINPT systems plan and afforded protected status where no beachfront development will be permitted.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, disturbance of nesting turtles, and erosion on all other nesting beaches.
- c) Under the guidance of the working group, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.

6.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. A toll-free hotline may be of utility. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CFD has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to sensitise Islanders to the importance of protecting the nests of such small nesting populations, and to encourage reporting of any illegal take of eggs or nesting females.
- d) Develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.
- e) Ensure school participation in any rookery monitoring programmes to sensitise children to the importance of rookery protection.

	Green	Hawksbill
Trellis Bay – Tortola	3	2
Jost Van Dyke	1	
Anegada (pre-DARWIN)		6
Guana Island		8
Tortola-East	1	1
Peter Island	2	4
Beef Island		2
Tortola-West		1
Norman Island	1	
Cooper Island	1	1
Great Camanoe		6
Little Thatch Island		1
Virgin Gorda - Little Dix Bay	1	1
Virgin Gorda -The Baths		1
TOTAL	10	34

Table 6.4. showing number of turtles of each species captured at a range of sites around Tortola and nearby Islands.

6.6. Status of Foraging Marine Turtles in the British Virgin Islands

6.6.1. In-water sampling around Tortola and nearby Islands

As part of the TCOT initiative, the first in-water tagging and sampling in the BVI was initiated. Methods have involved prospecting by boat-based observers followed by the rodeo technique, man-on tow followed by hand capture using free divers, purse seine netting of lagoonal areas, and using a large set net purchased for CFD from TCOT funds. Sampling was initiated by CFD (Photo 6.7) in partnership with TCOT and with the collaboration of local turtle fisher Tony Lettsome (Photo 6.8) and is now carried out regularly throughout the year at the sites listed in table 6.4. According to CFD officers, this sampling should be developed to include more effort in the waters of Virgin Gorda and Anegada, where turtles are reported to be in relative abundance (A. Pickering & S. Gore (CFD) pers. comm. 2004) .



Photo 6.7. BVI CFD in-water turtle team August 2002 (Photo B. Godley).



Photo 6.8. Turtle fisher Tony Lettsome releases tagged turtle (Photo B. Godley).

Species	<25cm	26-50cm	51-75cm	>76	Unknown Size	Total	Site
Green	1	4	2	8	0	15	1-6,9-12
Hawksbill	1	19	19	15	1	54	1,8,9,11-27
Loggerhead	0	0	3	3	0	6	21,22,28
Leatherback	0	0	0	2	0	2	29,13
Unidentified	0	0	0	0	4	4	5,13,30,31

Table 6.5. Summary of species and size class of individual turtles observed by divers in BVI Jan 02-Dec. 03. Key to locations: ¹Mountain Point - VG, ²Kellys Cove, ³Mellon Wall- Guana Island, ⁴National Parks, ⁵Wreck Alley - Cooper, ⁶Coral Gardens, ⁷Bronco Billy, ⁸Brewers Bay, ⁹Cooper Island, ¹⁰Norman Island, ¹¹Angelfish Reef- Norman ¹²The Rhone - Salt Isl., ¹³Alice in Wonderland, ¹⁴ Spyglass Wall - Peter, ¹⁵Diamond Reef, ¹⁶Blue Chromis-Cooper, ¹⁷Cistern Rock, ¹⁸Trellis Bay, ¹⁹Thumb Rock - Cooper, ²⁰Maryground - Guana ²¹Pelican Island, ²²Privateers Bay Norman Isl., ²³The Chimney's, ²⁴Scrub Island, ²⁵Vanishing Rock, ²⁶Playgorund - JostVanDyke, ²⁷The Baths, ²⁸Salt Island, ²⁹Sir Francis Drake Channel, ³⁰Carvel Rock, ³¹Ginger Steps- Ginger.

6.6.2. In-water sampling at Anegada

Growing out of the TCOT Initiative, sampling has been an integral part of the Darwin Initiative Assessment of the Biodiversity of Anegada. This has included the full range of techniques used around Tortola and is carried out by Anegada Project staff, including members of the Anegadian Fishing Community (Photo 6.9 - Damon Wheatley and Jim White). Personnel from the Darwin Project partner organisations regularly take part in fieldwork. To date (July 2004), 102 hawksbill turtles and 50 green turtles have been captured as part of this initiative.

6.6.3. Data gathered through Caribbean Turtlewatch

One of the methods used to gather information on foraging populations was *Caribbean Turtlewatch*, a questionnaire designed to be completed by recreational divers/snorkelers. More detailed methodology is given in Section 2 of this report. Copies of the materials used are given in Appendices 2.2-2.4.

During the period January 2002 – December 2003, 156 *Caribbean Turtlewatch* forms were completed, detailing dives and turtle sightings in the BVI. On 69 occasions turtles were observed. On 9 dives more than one turtle was observed (5 dives two turtles; 4 dives three turtles). In table 6.5 we summarise the species and size class of individuals observed. The dive operators involved included: Commercial Dive Services, Blue Water Divers, Dive BVI, Sail Caribbean, UBS, and White Squall.



Photo 6.9. Field team in Anegada (Photo B. Godley).

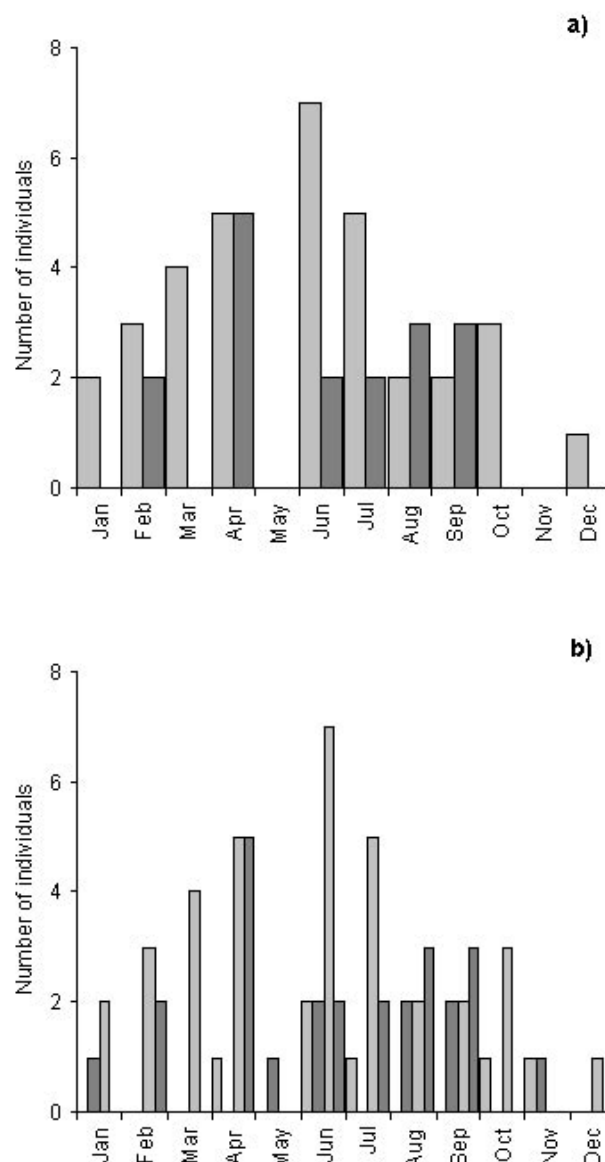


Figure 6.2. Temporal distribution of sightings of a) hawksbill and b) green turtles in the BVI. Pale shaded columns represent individuals of <75cm in carapace length estimated by observers. Dark shaded columns represent those >75cm, considered adults.

	Green		Hawksbill		Loggerhead		Leatherback		Unidentified		Total
	Juv	Adult	Juv	Adult	Juv	Adult	Juv	Adult	Juv	Adult	
Jan	0	0	0	0	0	0	0	0	0	7	7
Feb	0	0	0	0	0	0	0	1	0	0	1
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	6	3	0	0	0	0	0	0	9
May	0	4	10	4	0	0	0	0	2	0	20
Jun	4	2	8	2	0	0	0	0	0	0	16
Jul	2	1	4	3	3	2	0	1	0	0	16
Aug	0	1	5	2	0	0	0	1	0	1	9
Sep	0	0	2	2	0	0	0	0	0	0	4
Oct	0	0	2	0	0	0	0	0	0	0	2
Nov	0	0	0	0	0	1	0	0	0	0	1
Dec	0	0	0	0	0	0	0	0	0	0	0

Table 6.6. Temporal distribution of observations of all species in the BVI 2002/2003. Juveniles are classed as those <75cm in carapace length and adults those >75cm.

The most frequently observed species in the BVI is the hawksbill turtle (66% of sightings; Photo 6.10). Green turtles are also relatively commonly in these waters (20% of sightings). Loggerhead and leatherback sightings are relatively infrequent, and these species may be passing through the waters as they forage or migrate. Green and hawksbill turtles commonly reside on reefs or seagrass beds and thus there is a greater chance of them being observed by divers. The months during which individuals were observed are given in table 6.6. In addition, data on the temporal distribution of hawksbill and green turtle sightings are presented in figure 6.2.

Divers were asked the question: *Did the chance of seeing a turtle influence your decision to choose this particular dive?* Of the 128 individuals that responded, 16 answered yes, 110 answered no and 2 were unsure. When asked the question: *How important was your turtle sighting to the enjoyment of the dive?* 26 individuals responded that the

experience was very important, 44 that it was important, and 55 that it was of no importance.

These answers reflect that few individuals select dive sites for the specific purpose of seeing a turtle during their dive. Once seen however, turtles are appreciated by the majority of divers who rank the sighting as important or very important to their enjoyment. That 55 divers stated turtle sightings were not important corresponds with comments made during interviews by dive operators. While 4 of the 6 operators interviewed as part of TCOT SEQ ranked turtles as 'very important' to their businesses, 5 of the 6 also stated that the loss of turtles from OT waters would not affect the use of their services. One interviewee described turtles as one of many possible animals to be sighted that make a dive special. Nevertheless, turtles are used to promote tourism in the BVI. In the July 2004 edition of *Dive Magazine*, apparently Britain's best-selling dive magazine, BVI is featured in an article entitled *Eastern Caribbean Hotspots*, which stated that 'the islands are renowned for the high number of turtles.' Furthermore, in an advertisement issued by the BVI Tourism Board to UK newspapers in 2003, the BVI's tropical paradise qualities are exemplified by reference to a turtle basking on the beach.

6.6.4. Information gathered from sailing community

Inspired by the Caribbean Turtlewatch Initiative, Shannon Gore of CFD set up an analogous project to stimulate records from the sailing fraternity in the BVI. A form was distributed through Moorings Crewed Yacht Charters, Dive BVI and Serendipity Adventures. A total of 17 forms were received. These data are currently being analysed, and will offer increased insights into the distribution of marine turtles in BVI waters. Partners in this project included the crews from Serendipity (Serendipity Adventures), Hound Dog (The Moorings) and Capricious Cat (The Moorings).



Photo 6.10. Juvenile hawksbill turtle in reef habitat, Beef Island (Photo P. Richardson).

In the last 5 years...					
	Increasing	Decreasing	Same	Don't know	NR
Green	4	3	0	1	2
Leatherback	1	2	0	3	3
Loggerhead	0	3	0	2	4
Hawksbill	2	2	2	2	1
General	0	2	1	2	4

Since you can remember...					
	Increasing	Decreasing	Same	Don't know	NR
Green	3	2	2	1	9
Leatherback	1	1	1	3	3
Loggerhead	0	2	1	2	4
Hawksbill	2	3	1	2	1
General	0	1	2	2	4

Table 6.7. Perceived changes in abundance of turtles found in OT waters (by species and in general) in the last 5 years and since the respondent can remember (n=9 turtle fishermen who noticed a change; NR- not recall).

6.6.5. Trends in abundance gathered from the TCOT socio-economic questionnaire

Turtle fishers were asked to provide their views on changes in abundance of turtles in general in BVI waters (Q24a-c), when asked about trends for all animals they fish for. Of 17 turtle fishers, 9 responded to the question. Four turtle fishers felt there has been a general decrease in marine turtle numbers in the short term (5 years) and 3 saw this decrease in the long term (since they started fishing). One

believed turtle numbers had increased in the short and long term. The others believed numbers had stayed the same (n=1 in the short term, n=2 in the long term), or were uncertain of the nature of change (n=3, both time periods). While there is no strong pattern in responses, only 1 fisher described an increase over either time period.

All TCOT SEQ respondents were asked about trends in abundance of turtles found in OT waters (in general and by

In the last 5 years...					
	Increasing	Decreasing	Same	Don't know	NR
Green	7	7	5	6	3
Leatherback	6	3	1	10	8
Loggerhead	1	5	2	9	11
Hawksbill	7	5	7	6	3
General	5	5	5	6	7

Since you can remember...					
	Increasing	Decreasing	Same	Don't know	NR
Green	7	6	5	5	5
Leatherback	6	2	2	9	9
Loggerhead	0	5	4	7	12
Hawksbill	7	6	6	5	4
General	6	6	5	2	9

Table 6.8. Perceived changes in abundance of turtles found in OT waters (by species and in general) in the last 5 years and since the respondent can remember (n=28 respondents who noticed a change; NR-not recall)

species) in the last 5 years and since they can remember (Q104a-c). Views of all respondents are shown in table 6.8, while views of turtle fishers are isolated in table 6.7. Nine fishers noticed change, while 7 did not, and 1 did not answer. In contrast to responses for turtles in general (where few fishers recognized increases as discussed above), some fishers perceived increased abundance in green turtles in the short and long term. Also, equal numbers perceived an increase, decrease, and lack of change in abundance for hawksbills in the short term, and leatherbacks in the long term. Thus, while fishers agree on decreased abundance overall, they have more diverse views on changes in abundance by individual species.

Of all 55 respondents to the TCOT SEQ, 28 respondents perceived a change, while 25 did not, and 3 did not answer the question. The responses of the 28 perceiving a change are shown in table 6.8. There are no strong patterns among responses to this question, for either time period, for green or hawksbill turtles; approximately the same number of respondents believed that abundance has increased, decreased, stayed the same, or didn't know. In contrast, there is some perception of increased abundance of leatherbacks over both time periods, and of decreased abundance of loggerheads over both time periods.

6.6.6. Genetics

TCOT genetic analyses has shown that the haplotypes of samples from foraging turtles collected in the BVI have also been described in a number of other nesting sites and foraging areas (see section 10.4.3).



Photo 6.11. Sediment rich run-off follows all major rain events in Tortola (Photo P. Richardson).

For wild green turtles, haplotypes described in **foraging** turtles in the BVI have been described in **foraging** aggregations in Anguilla, Bahamas, Barbados, Montserrat, Nicaragua, TCI, USA and West Africa. These haplotypes have also been described from **nesting** aggregations in Ascension Island, Costa Rica, Mexico, USA, Venezuela.

For hawksbill turtles haplotypes described in **foraging** turtles in BVI have been described from **foraging** grounds in Anguilla, Cayman Islands, Cuba, Mexico, Montserrat, Puerto Rico, TCI. These haplotypes have also been described from **nesting** aggregations in Anguilla, Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, TCI, USVI.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004, and more definitive answers will be available at that point. At this point, however, it can be clearly highlighted that the turtles foraging in BVI waters will undoubtedly include those originating from a number of nesting colonies across the Caribbean region. Data will be disseminated as part of a cross-territory FCO Overseas Territories Environment Programme (OTEP) funded project, which will focus on Turtle Conservation, the Environment Charter and Multilateral Environment Agreements.

6.6.7. Threats

Perceived threats to turtles in BVI waters as outlined by CFD (S. Gore (CFD) pers. comm. 2004) include:

1. Direct take.
2. Incidental take in marine fisheries.
3. Increasing marine traffic in the BVI leading to boat strike.
4. Pollution and general environmental degradation (Photo 6.11).

Recommendations

6.1.3.2. Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes for both green and hawksbill turtles at a range of sites around the BVI, including Anegada.

This would incorporate additional genetic sampling to facilitate the further determination of trends in genetic stock composition of green and hawksbill turtle populations. It should be noted that efforts should be focussed on yielding meaningful CPUE data although this may, at times, lead to a lower sampling rate per survey trip. Under the guidance of the working group, steps should be taken to encourage the involvement of

interested local fishermen in all monitoring programmes and financial incentives should be considered so long as they fit within the remit of a sustainable programme.

6.1.2.2. Strengthen and enhance BVI's marine protected areas system

In order to preserve the marine biodiversity of the BVI, including marine turtles, it is recommended that the BVI marine parks are strengthened and extended. Current CFD-led monitoring of marine turtles will allow "hot spots" of marine turtle abundance to be defined and integrated within BVI National Parks Trust (BVINPT) system plan for marine protected areas. From limited monitoring carried out to date it appears that the only important turtle nesting beach included in the National Parks Plan is Rogue's Bay, Tortola. Although coastal areas of Windlass Bight in Anegada are proposed for protection, this does not seem to be the most important area for turtle nesting in Anegada.



Photo 6.12. Carrying out TCOT SEQ Survey (Photo P. Richardson).

Measures of direct exploitation	Past	Present	Never	NR or NA
By life stage				
Females on beaches	1	0	-	-
Eggs from beach	4	0	-	-
Turtles in water (intentional)	8	8	-	-
Turtles in water (incidental)	-	-	-	-
By product				
Meat				
Fishers who sell meat	5	6	-	-
Meat vendors	1	3	15	-
Meat consumers	15	18	22	-
Eggs				
Collectors who sell eggs	0	0	-	-
Egg vendors consumers	0	0	-	-
Egg consumers	11	18	-	-
Non-edible				
Fishers who sell shells	2	1	-	-
Shell vendors	0	1	-	-
Shell consumers	5	6	-	-
Measures of indirect exploitation				
Turtles indirectly used in business	18	-	-	-
Total interviews	55			

Table 6.9. Numbers of TCOT SEQ respondents involved in exploitation, by exploitation category (NR-no response; NA - not applicable).

6.7. Direct Use of Marine Turtles in the British Virgin Islands

6.7.1. Overview

The main domestic legislation covering marine turtle exploitation in the BVI is The Turtles Ordinance 1959 as amended (1986, 1987; Anon 1986) and the Fisheries Act, 1997. The updated legislation extends a moratorium on hunting leatherback turtles, prohibits egg harvest and contains at sea take to an open season (December-March inclusive) with a minimum take size (20lbs, 9.07kg). See Section 3 of this report for a full overview.

The Fishing Laws of the BVI are promoted in an attractive coloured pamphlet produced by CFD (Appendix 6.1). This outlines methods of capture which are illegal, the need for licenses, the marine protected areas and closed seasons for the four groups of concern: leaf or queen conch (*Strombus gigas*), Nassau grouper (*Epinephelus striatus*), red hind (*Epinephelus guttatus*) and marine turtles.

Data on use of marine turtles were gathered by combining published literature, information from project partners, and data gathered using the TCOT SEQ (See Section 2.1; Photo 6.12). Fifty-five questionnaires were completed in the BVI and a breakdown of information gathered on marine turtle exploitation is digested in table 6.9.

6.7.2. Harvest of adults on the nesting beach Leatherback turtles

In his overview of the regional turtle fishery, Rebel (1974) states that in the BVI turtles are netted and turned on the beaches and that the leatherback turtle was 1 of 4 sea turtle species caught, although he does not give an indication of magnitude. Based on interviews with fishers, Fletemeyer (1984) suggested that approximately 2 individuals of this species nested in 1981, but he did not quantify take. The work carried out by Fletemeyer was a contribution towards the first Western Atlantic Turtle Symposium, which marked the start of marine turtle research in the BVI.

In the 1980s, CFD began gathering data on marine turtles and their fisheries. Lettsome (1989) overviewed the leatherback turtle fishery, highlighting how there was no overlap between the activities of the leatherback turtle fishers or “trunkers”, who captured leatherback turtles on the nesting beaches, with those of “turtle fishers”, who set nets for green/hawksbill turtles as part of other marine fishing activities. The trunk harvest was not considered one of massive economic importance, but of profound cultural significance involving sharing of meat, eggs and the oil derived from the tissues. The oil was produced by dismembering the carcass, and the head, carapace, plastron, flippers and fat were boiled in seawater in a copper kettle on the beach. Oil was siphoned off as it rose to the surface of the water. The oil is reputed to have aphrodisiac qualities and have medicinal value, particularly with regard to respiratory complaints (Eckert *et al.* 1992; Lettsome 1989).

	“Crawls” Recorded	Estimated Number of Females	Number Killed
1986	7	3	1
1987	6	4	1
1988	1	1	0
1989	0	0	0
1990	5	3	1
1991	9	2-4	2
1992	6	4-5	0

Table 6.10. The number of leatherback turtle “crawls” i.e. nesting emergencies, the estimated number of females nesting and estimated take per annum (data after Eckert *et al.* 1992).

In his report, Lettsome (1989) notes that the trunk fishery was concentrated in villages close to leatherback nesting beaches on Tortola, Virgin Gorda and Anegada and that within living memory it had declined significantly along with the nesting population. He records how as many as six leatherback turtles were reported to have nested per night on some key beaches, such as Josiah's Bay in the 1920s, with further popular accounts suggesting that in the 1960s it was not unusual to take two or more turtles per night. By the 1980s, only a handful of nesting activities were recorded each year, and it was feared that the population would soon become extinct in the BVI (Cambers & Lima 1989; 1990). While the 1959 Ordinance specifically excluded leatherbacks in the text by stating “*turtle means sea or river turtle save and except trunk turtles*”, two successive amendments to the Ordinance in 1986 and 1987 resulted in leatherbacks becoming partially legally protected. These amendments prohibited take on the beach and during the closed season, which encompassed the vast majority of the nesting season.

However, legal protection did not immediately stop the harvest. See table 6.10 below. In 1991, one leatherback was slaughtered under a special permit from the Ministry of Natural Resources, one was slaughtered illegally, and another was rescued and released by local community members before it could be slaughtered (Hastings 1991).

Although numerous factors may be responsible, changes in local legislation in concert with increased law enforcement and awareness raising efforts appear to have had a positive effect. The leatherback nesting population in the BVI is showing signs of recovery (Hastings 2003 - see above). Although the trunking tradition was curtailed with the introduction of revised legislation in 1986 and 1987, demand for trunk oil remains high, and trunkers continually ask for exemptions to take a leatherback. Currently, all such requests are refused (B. Lettsome (CFD) pers. comm. 2003). It is perhaps not surprising that these requests persist and that illegal take is contemplated given: 1. the cultural importance of leatherback turtle derived products, and 2. that each leatherback has the potential to yield a profit of several thousand US dollars (Eckert *et al.* 1992). Some still watch

for the nesting females, but very few leatherback turtles have been killed in recent years. Since 1993, authorities are aware of one successful killing in 1996 and one aborted attempt in 1999 (Hastings 2003).

During the TCOT SEQ, attempts were made to interview one of the older 'trunkers' who currently assists the CFD with monitoring leatherback nesting. Unfortunately, he refused to be interviewed. Only one SEQ interviewee reported formerly consuming trunk oil, and thus little insight was gained into this culturally important turtle use in BVI.

Hardshell turtles

We have not sourced any historical accounts of the level of exploitation of nesting hardshells. Rebel (1974) states green, loggerhead and hawksbill turtles are all caught in nets or on the nesting beach, but gives no indication of magnitude. Based on interviews with fishers and aerial surveys flown in July 1981, when 38 "fresh nests" were recorded, Fletemeyer (1984) estimated the annual nesting populations for the three hardshell species (green turtles 50-100 females; hawksbill turtle 25-75 females; loggerhead turtles: very small, perhaps a few individuals). He also suggested that a take of 20% or 25 nesting females per annum. Although the report concentrates on the leatherback fishery, Lettsome (1989) notes that by the time of writing there had been a considerable decline in the local family/community oriented turtle fishery. Although anecdotes were gathered by the TCOT team regarding occasional take of nesting females, there are now few, if any areas, where hardshell turtles nest regularly in sufficient numbers to warrant harvest effort (Hastings 1992) other than perhaps Anegada. From interviews carried out by Downs (1997), it appeared that capture of turtles on the beaches of Anegada had declined in recent years.

6.7.3. Harvest of eggs

Fletemeyer (1984) suggested 50% mortality of eggs, with human poaching as the major cause (table 10 in Fletemeyer 1984). He estimated some 12,000 eggs were taken per annum, which equates to ca. 100 clutches. Nesting levels at all sites, other than perhaps certain stretches of the Anegada coastline, are now very low. Although occasional anecdotes are received by CFD that eggs have been taken for human consumption (Eckert *et al.* 1992; Hastings 2003), this is now exceedingly rare in Tortola and the other populous islands, and is certainly reduced from levels recorded in the early 1990's (Eckert *et al.* 1992). From interviews carried out by Downs (1997) on Anegada, it appeared that turtle egg collection, although prolific in the past, had all but ceased.

The TCOT SEQ reinforces Downs (1997) findings, as no respondents reported that they currently collect eggs. We interviewed 4 former egg collectors, however, three of whom had stopped approximately 15 years ago (range 12 to 18 years) and one of whom stopped 'a long time ago.' Reasons for stopping collection were cited as: laws (2), lack of opportunity (1), and because of not liking eggs (1). When they collected, 2 preferred hawksbills because of their greater availability and 2 had no preference. One of these

respondents collected eggs only once, while 2 collected them once a year, and 1 collected them once a week. None of these collectors sold their eggs.

TCOT SEQ interviewed 11 former egg consumers, but found no current consumers. Of the former consumers, 2 reported having eaten them long ago in childhood, 2 reported stopping eating because of lack of opportunity, 1 cited conservation reasons, 1 cited laws, 1 claimed he no longer liked them, and 1 gave no reason. Two people did not respond to the question. Three could not remember when they had stopped, while 1 stopped in the 1970s, 1 in the 1980s, 2 in the 1990s and 2 in the 2000s. This highlights that although legislation may have curbed egg consumption it did not stop it. Only one former consumer expressed a species preference for hawksbill eggs. Of the five respondents who answered a question about changes in availability of eggs over time, all believed that availability had decreased.

No vendors of turtle eggs (past or present) were found during the TCOT SEQ.

6.7.4. Harvest at sea

There is a long history of marine turtle harvest in the BVI, both for meat and shell. Although we cannot preclude take of leatherback turtles at sea, and some take of the loggerhead has been recorded (Eckert *et al.* 1992; Rebel 1974), the vast majority of this take is likely to have been made up of green and hawksbill turtles. The earliest literature record we could locate outlined how in 1929, a total of 2,268lb (1031kg) of "Turtles (alive)" were imported into the US Virgin Islands from Tortola (Fiedler & Jarvis 1932). It is not possible to accurately translate this into numbers of turtles, but it probably represents some 10-40 individuals, given that the range of sizes likely to have been traded would have been 50-250lbs. In addition, Rebel (1974) outlines how approximately one quarter of green and hawksbill meat is exported to the USVI and that this catch was 5,880lb (value \$4,140) in 1967. These limited data highlight that turtles were exported from the BVI at this time and, although this may have been a small-scale enterprise, it conflicts with Eckert *et al.* (1992) which states that it did "not appear that there was ever an established commercial export of sea turtles."

The accounts of Fiedler and Jarvis (1932) of how fishers in the US Virgin Islands used turtle nets are illuminating. Nets were 20 inch stretched mesh, 2-3 fathoms deep and 5 to 50 fathoms long with a cork floated line and a leaded ground line. They were set as drift or sunken nets, and a roughly turtle shaped wooden decoy was attached to each net to attract turtles. The authors also outline how live green turtles were stored in wooden kraals until shipment to New York City and how hawksbill shell was typically shipped to England at a price of the order of \$20 per lb of scutes/tortoiseshell. Of further interest from the arcane literature was the account of novel turtle marking procedures for research on marine turtles carried out in the USVI (then Danish VI) two decades earlier by Schmidt (1916) who writes:

"It is well known that the yield of turtle catching at the present time is far less than in former years. Every report on fishery conditions in the West Indies mentions this and there is a consensus of opinion that measures must be taken to prevent this important industry from dying out."

Thus, concerns were present as to the status of the turtle fishery in the region very soon after the start of the 20th century.

In his seminal work, Fletemeyer (1984) detailed how the main turtling ports were also the main fish landing sites: Settlement (Anegada), Fish Bay and East End (Tortola). Turtle fishing methods included seine nets and harpoons (Sept-June). He was not able to give any firm quantitative estimates per fishing harbour, but estimated through interviews with local fishers that the 1981 directed catch was of the region of 600 green turtles and 300 hawksbill turtles (table 12 in Fletemeyer 1984). An estimated 200 turtles were caught incidentally in other fisheries (table 13 in Fletemeyer 1984), but it is not clear whether any of these were landed. Later in the same report however, the number of turtles caught at sea is only given as 100, although this may be a typographical error intended as 1000. It was estimated that in 1981 this industry was valued at \$40,000, employing 20 persons (table 16 in Fletemeyer 1984).

From this benchmark, it appears that in general the turtle fishery has continued to decline (Eckert *et al.* 1992; hawksbill turtles: 200 in 1985, 71 in the 1990/91 season; green turtles: 75 in 1985; 32 in 1990/91). At the start of the TCOT project, CFD staff felt that the turtle fishing effort was much reduced, with some opportunistic take by fishers focusing on other taxa and a total of some 5-6 active turtle fishers in the BVI (1 in Tortola, 2-3 in Anegada, 1 on Cooper and 1 on Jost Van Dyke). CFD estimates of the number harvested of both species during the season given at the beginning of this survey were: 1999 - 60, 2000 - 50, 2001 - 40 (M. Hastings & A. Pickering (CFD) pers. comm. 2002).

In a preliminary interview with a Tortola based turtle fisher, he suggested he took 20-50 turtles per season using floating swing nets. Most of these were green turtles (50-250lb) with occasional hawksbills. All turtles are captured alive and sold directly by himself for \$2.5 per lb live weight or \$5 per lb butchered.

As part of open ended interviews with community members in Anegada, Downs (1997) gained the impression that although turtle consumption is considered traditional, community sharing of meat, as carried out in the past, no longer takes place. Although some fishers still took turtles, some had stopped for commercial reasons i.e. the price per lb was so low that the enterprise was no longer commercially viable.

It is worthy of note that Overing (1996) recorded suspected fibropapilloma on three individual green turtles at Peter Island and recommended that since:



Photo 6.13. Large juvenile green turtles are found in seagrass beds (Photo C. Clubbe).

"health risks posed to human by tumor-afflicted turtles have not been investigated, it seems prudent that fishers be warned not to keep or sell meat from diseased turtles."

In total, 7 former turtle fishers and 10 current turtle fishers were interviewed as part of the TCOT SEQ. Of the former fishers, only 2 expressed preferences for species (one preferring greens and the other hawksbills). Five of them sold turtles, 1 did not and 1 did not answer. Three fishers identify turtles as having been very important to them, 1 somewhat important, 1 not important, and 1 did not answer the question. Reasons for no longer fishing for turtle included: retired from fishing (2), law (1), lack of market (1), no longer comes across them (1).

Of the 10 current turtle fishers, most preferred green turtles (n=7), and one stated a preference for hawksbills. Only 1 fisher reported having caught a loggerhead (1 in his life). For green turtles, numbers caught ranged from a minimum of 1 to a maximum of 60 per year (median=4, IQ range = 2-22.5) with a total reported catch of 172 per annum (n =10 fishers). Fishers catch green turtles of varying sizes, with the minimum size reported being 28lbs and the maximum being 400lbs. The reported 'average' sized catch ranged from 40-300lbs. For hawksbill turtles, between 1 and 35 turtles were reported captured per year (median=2, IQ range=2-8.5) with a total reported catch of 69 per annum (n=8 fishers). Similar size ranges are reported, with a minimum of 20lbs and a maximum of 300lbs. The reported averaged size ranged from 28-150lbs. Hand capture and nets are the reported methods of capture, with approximately equal numbers of fishers using them.

Turtle fishers in Anegada allowed us to measure some of their legal catch in February 2004. We measured 8 turtles (7 green turtles ranging from 59-85 cm CCL (Photo 6.13) and one hawksbill turtle 44cm CCL). From our available length to weight data as part of our research in Anegada, these green turtles would have weighed approximately 23-66kg and the hawksbill would weighed approximately 8kg.

All of the current turtle fishers fish both for cash and subsistence, and 9 are full time fishers. Few provide information on sale prices. For both greens and hawksbills, the price received for turtle meat ranges from \$2-5/lb (average \$3).

There is no catch recording system and we did not interview all fishers or turtle fishers, but based on all available data it appears that marine turtle catch is higher than originally estimated by CFD personnel with approximate catches, based on cumulative total of all turtles captured in all estimates of current directed take, of >150 green turtles and >50 hawksbills being reasonable minimum estimates. The true number captured could actually be of the order of 2-3 times greater than this as: 1. we did not interview all turtle fishers and Virgin Gorda was particularly underrepresented; 2. this does not incorporate an estimate for incidental take and subsequent use.

Consumption of meat

We interviewed 15 former turtle meat consumers. Reasons these individuals no longer consume meat included: losing interest (8), laws (3), no opportunity (2), conservation (1), opposed to it (1), and became a vegetarian (1). Three reported eating it 'long ago', and 2 provided no reasons. These respondents stopped eating turtle an average of 19 years ago, but ranging from 'since I was a child' to 'in the past few years.'

Eighteen current meat consumers were interviewed. Nine preferred green turtle meat, 6 preferred hawksbill meat, and 3 had no preference. Five interviewees reported prices paid for meat products, with meat costing between \$3-4/lb, and a meal in a restaurant costing \$10-12. Six of these respondents also give gifts of meat to friends and family.

Estimates of quantity of meat currently consumed, and how quantity was estimated, varied. Three consumers (all fishers) reported eating the meat of 2-3 turtles per year. One person eats 25lbs/year, and a second eats less than 5lbs/year. One person reported eating turtle once a month, while 2 report eating it on a weekly basis. A final respondent eats turtle 'as often as he can get it.' Those who purchase meat buy it from the harbour (n=1), from restaurants (n=4), and through fishers (n=1). Four do not purchase, and the other respondents did not answer the question.

Consumers were asked to comment on changes in availability of meat for consumption over time (short and long term). Those who responded said that that meat availability had decreased in the long term (since they could remember, n=3) or that they did not know (n=3). Views on availability in the last 5 years varied: 3 believed availability had decreased, while 2 believed it had stayed the same, and 1 did not know.

Meat vendors

We interviewed one former vendor of meat products, a store owner who stopped selling meat in 1998 due to protests by expatriate customers, an important component of his

clientele. Before he stopped, he claimed that sales of turtle meat were somewhat important to his business.

We interviewed 3 current meat vendors, all of whom were running restaurants (Photo 6.14). They all purchase their products for sale differently; 1 directly from a fisher who brings it to the restaurant, 1 at the market, and 1 at a fish landing. Two purchase on a monthly basis and 1 on a weekly basis. Both hawksbill and green turtle meat is purchased. All reported selling turtle meat during the season, but 2 suggested that demand increases around festivals and holidays. Two of the vendors believed that the availability of meat has decreased, and 1 did not answer. Two of the vendors ranked the sale of turtle meat as 'very important' to their businesses, while 1 said it was of little importance.

Illegal Activities

Turtle harvest was controlled by the 1959 Turtle Ordinance, which was amended in 1986 and revised in 1987. However, Lettsome (1987) reports that in November 1986 and 1987 there were confirmed reports of infringements, including illegal fishing, landing and retail of turtle products despite extensive publicity. Ignorance of the new legislation was apparently forgiven in these years, but was not to be tolerated in 1988, when a fishing vessel valued at US\$140,000.00 was seized at Red Hook, St. Thomas (U.S. Virgin Islands) by the US National Marine Fisheries Service as a result of its involvement in violations of the U.S. Endangered Species Act of 1973. It was alleged that the vessel was used to import sea turtle meat into the U.S. Virgin Islands from Anegada, BVI, in January of 1988 in violation of both U.S.



Photo 6.14. Turtle on the menu (Photo P. Richardson).

and BVI laws. The meat was subsequently sold to several recipients in St. Thomas, one of whom was an undercover agent working for the U.S. National Marine Fisheries Service. One of the 3 persons implicated in the smuggling operation pleaded guilty to knowingly importing and selling the sea turtle meat. Under terms of a plea agreement with the U.S. Attorney's Office, he received a US\$1,000 fine. Criminal charges against 2 other persons allegedly involved, including the owner of the vessel, were reported as pending in 1989 (Anon 1989). Additional possible illegal trade links with the USVI are highlighted by Fleming (2001).

During the Virgin Gorda Easter Festival (10 April-12 April 2004) BVI CFD staff observed 8 stalls selling marine turtle meat out of season. A warning letter has been sent to both the BVI Festival & Affairs Committee as well as all those selling turtle (S. Gore (CFD) pers. comm. 2004).

Relationship within the wider fishery sector

The marine fishery is a small yet significant part of the BVI Economy, contributing some \$4m in 1997; just less than 1% of GDP. Most recently available statistics (Pomeroy 1999) state that this industry employs 174 commercial fishers on a full or part-time (fishing >1 time per week) basis including:

Tortola	104
Virgin Gorda	40
Anegada	21
Jost van Dyke	6
Outer Islands	3

The marine turtle harvest is no longer a significant monetary component of the overall marine fishery and it is not surprising that there was no mention of it within the Fisheries Management Plan for the British Virgin Islands (OECS/NRMU 1998).

a There should be regulations for which species of turtle can be caught				
	Yes	no opinion	no	na
n	11	1	3	2
%	65	6	18	12
b There should be regulations for the type of fishing gear and methods that can be used to catch turtles				
	yes	no opinion	no	na
n	11	3	1	2
%	65	18	6	12
c There should be regulations for the number of turtles that can be caught				
	yes	no opinion	no	na
n	9	2	4	2
%	53	12	24	12
d There should be size limits for turtles caught				
	yes	no opinion	no	na
n	13	2	0	2
%	76	12	0	12
e Open and closed zones should be set for turtle fishing				
	yes	no opinion	no	na
n	6	3	6	2
%	35	18	35	12
f Open and closed seasons should be set for turtle fishing				
	yes	no opinion	no	na
n	13	2	0	2
%	76	12	0	12
g Who should be involved in setting regulations?				
	fishermen	gov't authorities	conservationists	experts
n	12	9	3	1
%	71	53	6	18

Table 6.11. Views of turtle fishers on options for managing the turtle fishery.

6.7.5. Views of turtle fishers on regulation of the fishery

Turtle fishers were asked for their views on potential fisheries management options, and the results are shown in table 6.11. As the table shows, there is wide support for particular types of regulations (size limits and seasons), and majority support for others (species caught, fishing gear). There is less support for geographic restrictions on fishing. The apparent extent of support for size limits should be treated with caution, as no size limit (maximum or minimum) was stated. As the fishery currently has a minimum size limit, fishers may be confirming their support for this, rather than for size limits in general (i.e. they may resist a change to maximum size limits). Whatever the policies adopted, fishers see themselves as central to policy making. The majority also see an important role for government authorities in this process.



Photo 6.15. Hawksbill turtle scutes in garden of turtle fisher (Photo P. Richardson)

6.7.6. Trade in shells and shell products

As well as being a source of meat, shells, particularly of the hawksbill, were traditionally cleaned, cured and sold for both a domestic and possible export market, but this had markedly declined by 1992 (Eckert *et al.* 1992). Retail of non-edible turtle products has all but disappeared, but occasional items are undoubtedly sold. Fleming (2001) reports that a hawksbill shell jewellery box was found for sale in Cane Garden Bay. It had purportedly been imported from the Dominican Republic unknowingly. During a TCOT survey of all possible retail outlets in March 2002, the only shell product we observed was one small hawksbill shell for sale at the market at cruise ship dock, priced at \$100. When TCOT personnel tried to photograph this, we were prevented from doing so and the shell was obscured. In April 2003, TCOT staff found several tortoiseshell bangles and earrings in one gift shop in Road Town during the TCOT SEQ. The vendor had purchased these products from the Cayman Turtle farm some years ago. She sells few items, primarily due to import restrictions in other countries, and has no intention to purchase further stock once current supplies run out (although she would if trade restrictions changed). No other potential vendors reported

ever selling turtle shell products. In the garden of one turtle fisher interviewed, carapace scutes were stored but were not treated as if they had any real value (Photo 6.15)

6.7.7. Incidental catch in marine fisheries

Lettsome (1989) reports concern regarding long-lining impacts on leatherback turtles and confirms 2 captures of leatherbacks in BVI waters in 1988. The fate of these animals is unknown and the magnitude of this impact has not been assessed. Additional records (minimum 2) from 1990 were recorded by Tobias (1991). On February 22, 2002, a leatherback turtle was found entangled in the ropes of a fish pot off Peter Island and was rescued, tagged and released (S. Gore (CFD) pers. comm. 2004). Lettsome (1988) reports that one adult leatherback turtle nesting in Anegada was disorientated by lights, became dehydrated and died.

The TCOT SEQ interviewed 26 fishers, 11 of whom reported occasionally catching sea turtles as by-catch (of note, 8 of these are current or former turtle fishers, who reported by-catch when fishing for other animals). Nine of these were full time fishers, while the other 2 fish and have other employment. The number of turtles caught ranges, from a low of once in their life ($n=2$) to a high of 10 per year ($n=1$). Turtles are found mostly alive ($n=9$), with 1 fisher reporting they are mostly dead, and 1 reporting equal numbers alive and dead.

Of the three non-turtle fishers, 2 report releasing whatever they catch, while 1 will keep hawksbills (to use himself). Of the current and former turtle fishers, 2 reported accidentally capturing leatherbacks and loggerheads, and stated that they release these. The others reported accidentally capturing green and hawksbill turtles, which are kept (to use, sell or gift).

Six fishers believe that other fishers catch turtles accidentally, mostly greens and hawksbills, and 3 believed these would be kept (the others did not know or did not answer).

Recommendations

6.1.2.1. Harvest legislation recommendations

Although not monitored, the BVI turtle harvest is regulated by the Turtles Ordinance 1959 as amended 1986 and the Fisheries Act 1997. This legislation is not comprehensively upheld or enforced, e.g. as evidenced by the high prevalence of turtle meat consumed at the Virgin Gorda Easter Festival during the designated closed season for the turtle fishery in 2004. We recommend a number of changes below. Any future harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in turtle abundance, in addition to adequate surveillance and enforcement.

In 2001, the Government of the BVI produced a draft document entitled *Fisheries Regulations 2001*, which we were allowed to view. Sections 22, 26 and 27 dealt with regulations pertaining to the harvest of marine turtles and their eggs. Section 22 contained text that is contradictory to text in section 26 with respect to closed seasons for marine turtle harvest. Text in section 22 also contradicted the text of section 27 with respect to moratoria on the harvest of certain species of marine turtle. We felt that this needed reconsideration in order to become a more meaningful piece of legislation. The Regulations have now been gazetted, but we have not been able to obtain a final copy in time for final reporting. Based on the draft regulations, TCOT recommends the following amendments of the legislation to further facilitate sustainable harvest of BVI's foraging green and hawksbill turtles;

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.
- b) Consider a continued minimum size limit, as most fishers already accept this as a conservation measure. A suggested minimum would be 20lbs (9.07kg), with an equivalent minimum curved carapace length that should be stipulated in any amended legislation.
- c) Establish a limited turtle fishing licensing scheme, whereby especially licensed turtle fishermen agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including compulsory reporting to and catch biometric measurement/sampling by CFD of all turtles caught in advance of slaughter. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes.
- d) Ensure prohibition of the harvest of loggerhead and leatherback turtles given their very low numbers in the BVI.
- e) Increase fines for infringements to a more punitive level in line with those recommended by other OTs.

6.1.2.4. Revision of MEA legislation

The Endangered Animals and Plants Act, 1987 (Cap. 89) should be amended to prohibit commercial import and export of turtles and all wild turtle products of marine turtle species, so that this legislation fully transposes CITES to domestic law.

6.8. Indirect Use of Marine Turtles in the British Virgin Islands

6.8.1. Turtle watching on beaches

Given the small numbers of turtles nesting, there is not as yet any formal turtle watching. Hastings (2003) writes:

"Besides obtaining scientific and technical information about the animal and its biology, our work seeks to change the traditional reliance on the taking of animals and replace it with the idea that organized "eco-tours" to see the trunks nesting (and the hatchlings emerge) can provide both a source of sustainable income and an opportunity for the community to interact with these ancient creatures in ways that promote their survival over the long term. A serious limiting factor to drawing visitors to the beach has been the small number of turtles that nest and the concomitant uncertainty of whether observers might ever see a turtle. Notwithstanding, it is hoped that as nesting continues to increase it will reach a level where "eco-tours" can play a significant role in helping to ensure the continued presence of trunk turtles on the beaches of the BVI."

6.8.2. Dive/snorkelling tourism

Dive tourism is a significant business in the BVI, with approximately 15 operators employing approximately 150 people (S. Gore (CFD) pers. comm. 2004). There has been reasonable uptake of *Caribbean TurtleWatch* by the industry. There is only one mention of marine turtles in the diving and snorkelling guide to the British Virgin Islands (Handler 2001).

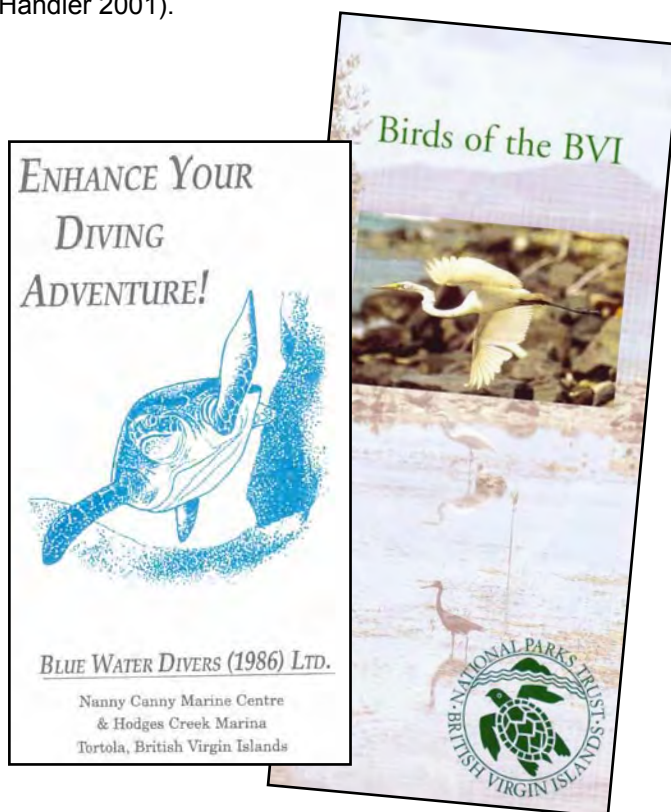


Photo 6.16. BVINPT and dive shop make use of turtle imagery on leaflets.

Snorkel tours are also a significant business with approximately 25 operators employing some 200 people (S. Gore (CFD) pers. comm. 2004). Most of these operate around Tortola and surrounding islands, where turtles can be observed, although not in great numbers.

As mentioned above, turtles can be a valued feature of a dive, but most people do not select dives on the basis of whether or not they might see a turtle. As the SEQ revealed, of the 6 dive operators surveyed, 4 ranked turtles as 'very important' to their businesses, but 5 of the 6 also stated that the loss of turtles from OT waters would not affect the use of their services. Turtles appear to be one of many attractions the BVI has to offer divers.

6.8.3. Aquaria holding captive turtles

There are no such facilities in the BVI, although turtles are occasionally encountered in home or shop aquaria (S. Gore (CFD) pers. comm. 2004)



Photo 6.17. Turtle themed merchandise (Photo L. Campbell).

6.8.4. Other marketing uses

As part of BVI Tourism's "Nature's Little Secrets" marketing strategy, BVI was put forth as a Caribbean Ecotourism destination; with a website module appearing dedicated to "Turtles" (see Appendix 6.2). Although it details the fact that green turtles, hawksbill turtles and leatherback turtles visit BVI annually, and it stipulates that turtles face many threats, it does not mention BVI's turtle harvest, instead stating:

"Because turtles face so many challenges to their survival, international laws, or moratorias, have been instituted against their capture or harassment. We can do much, locally, to help turtles survive. We can dispose of our garbage properly. We can encourage restaurants and hotels to turn off their beachfront lights off during the nesting season, on known nesting beaches."

This type of sentiment is reflected in the results of the TCOT SEQ that found coexisting high levels of support for turtle conservation with acceptance of the local use of marine turtles (see section 6.9. below)

Other uses of marine turtles in marketing and promotion are diverse, although far below the level of usage elsewhere, e.g. in the Cayman Islands. For example, the logo of the BVI National Parks Trust Contains a turtle and this appears widely in educational materials, websites, with a turtle icon representing a national park on a widely distributed map of the islands (Photo 6.16). At least one dive operator (Blue Water Divers) uses a marine turtle as its logo (Photo 6.16). Although the Spring 2002 BVI Welcome Tourist Guide magazine contained a three page feature on the BVI Conservation and Fisheries Departments turtle monitoring project, no other mention is made regarding turtles (compare with Section 7 regarding the Cayman Islands). One of the most important nesting sites on Tortola is that of Long Bay backed by the Lambert Beach Resort. Its brochure features a picture of a hatchling leatherback turtle and the turtle theme is heavily merchandised in the hotel, with t-shirts and artwork on a turtle theme for sale (Photo 6.17).

6.8.5. Data from the TCOT socio-economic questionnaire

We interviewed 18 indirect users of marine turtles, and their uses of turtles varied. Seven businesses view live turtles as an attraction (dive operators/boat charters), 4 use images of marine turtles in advertising, 3 incorporate marine turtles in their official logos, 2 sell merchandise depicted or representing turtles, 2 sell photographs of turtles, 1 scientist studies turtles, and 1 conservationist focuses in part on turtles (multiple answers permitted). Nine respondents said that turtles were very important to their businesses, 5 said somewhat important, and 2 said unimportant. However, when asked how the absence of turtles from OT waters would impact on their businesses, 12 respondents believed their business would stay the same, 3 thought theirs would decrease, 2 didn't know, and 2 did not answer the question.

6.9. Attitudes to conservation

TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine turtle management. Respondents could agree, disagree, or have no opinion. In some cases, they could choose 'not applicable'. Basic results are summarized here. The most common response is cited. In general, most respondents agreed that:

- It is important that sea turtles exist in the wild in the future (96%)
- The government needs to actively work to protect sea turtles (89%)
- Turtles play an important ecological role in our natural environment (86%)
- Turtles should be protected, regardless of their use to humans (84%)
- Turtles are culturally valuable in this OT (79%)
- Local people should be allowed to catch and eat sea turtles, provided it doesn't threaten the regional population (77%)
- As turtles are migratory, they should be managed in cooperation with neighbouring states (77%)
- Some income from tourism should be used to support sea turtle conservation efforts (75%)
- The government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (75%)
- Local people should be allowed to purchase sea turtle meat (71%)
- Turtles are economically valuable in this OT (66%)
- Turtles should be used both as tourist attractions and as a source of food (63%)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (55%)
- Turtles should be used as a tourist attraction rather than as a source of food (50%)

Close to an equal number of respondents agreed and disagreed with the following statements:

- Tourists should be allowed to purchase sea turtle meat (48% agreed, 45% disagreed)
- Existing laws protecting marine turtles are effectively enforced (43% agreed, 41% disagreed)

Most respondents disagreed with the following statements:

- Turtle fishing should be unregulated (88%)
- Turtle fishing should be stopped completely (61%)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (59%)

The results shown above suggest that there is a high level of support for general conservation statements (i.e. it is important that sea turtles exist in the wild in the future), and for the local capture, consumption and sale of sea turtle meat. Respondents agree that government has a critical role to play in turtle conservation, but disagree with regards to whether or not it is currently doing this effectively. Views on whether or not tourists should be able to consume and/or buy turtle products are divided.

Initial and cursory analysis of responses to these questions by stakeholder group suggests that there are some important areas of disagreement amongst some stakeholders. For example, turtle fishers as a group generally agree with many of the responses of the surveyed population as a



Photo 6.18. Mervin Hastings gives BVI country report at TCOT workshop (Photo S. Ranger).



Photo 6.19. Arlington "Zeik" Pickering assists with satellite transmitter attachment in Bermuda (Photo P. Richardson).



Photo 6.20. Staff from BVINPT and CFD join with Anegada community members to undertake turtle research (Photo B. Godley).

whole, though their support (or lack thereof) for statements is often stronger. However, there are several questions for which their opinions differ:

- Tourists should be allowed to purchase sea turtle meat (76% agreed)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (71% disagreed)
- Turtles should be used as a tourist attraction rather than as a source of food (71% disagreed)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (53% agreed)
- Turtles are economically valuable in this OT (47% agreed and 47% disagreed)

Thus, it appears that turtle fishers disagree with the general population primarily regarding tourist access to marine turtle products. Turtle fishers are not only defensive of their rights to fish turtles, but of the rights of others to consume them. However, this may be less of a defence of tourist rights and more a resistance to regulations on consumption and sale.

Due to the non-random sampling employed in this survey, interpreting the results of these opinion questions in particular should be done with caution, as respondents are not representative of the BVI population.

6.10. Capacity Building and Outreach Activities During TCOT

6.10.1. Capacity building

Mervin Hastings (Photo 6.18) and Arlington “Zeik” Pickering of CFD took part in the TCOT training workshop in Grand Cayman in August 2002, and Arlington Pickering (Photo 6.19) and Shannon Gore attended the training course in Bermuda in August 2003. BVI partners were subject to all the generic TCOT assistance (see Section 11), and despite poor online access, communications were very good. In-water turtle work has expanded rapidly since the advent of TCOT, and is being progressed in Anegada as part of the Darwin Initiative Assessment of the Coastal Biodiversity of Anegada (Photo 6.20).

6.10.2. Outreach activities

BVI has been part of the generic dissemination outputs of the TCOT project (see section 12), and in collaboration with project partners we were successful in attaining media items. This was particularly true of MCS sponsored satellite tagging of a leatherback turtle in 2002, which created a great level of interest in the local community (Photo 6.21) despite the track being short lived (transmissions were lost off the nesting area of Puerto Rico, possibly as the result of male reproductive advances). TCOT staff have met with a number of community and school groups through the course of the project (Photo 6.22).

Recommendations

6.1.1.1. Increase the capacity of the Conservation and Fisheries Department

- a) Ensure CFD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry and analysis for turtle monitoring programmes as part of their overall marine and coastal environment monitoring and research.*
- b) Given the importance of all natural resources of Anegada, a priority for increased capacity would be a field-base (for visiting staff in addition to permanent personnel) and supporting infrastructure, including a research/enforcement vessel, based in Anegada.*
- c) Ensure that all new research staff are adequately trained in marine turtle biology, as well as research and conservation techniques.*

6.1.1.2. Establish a multi-stakeholder marine turtle management process

Identify and establish a Marine Biodiversity Working Group to promote the conservation of marine resources and include representatives of all interest groups and stakeholders (e.g. government agencies and departments such as CFD, BVI National Parks Trusts, Planning and Tourism; NGO's; hoteliers; dive operators; construction industry representatives, fishers, H. Lavity Stoutt Community College and interested members of the public). The working group should meet regularly (ca. 4 times per year) to discuss and advise government (esp. CFD) on marine turtle management issues, paying particular attention to fisheries issues, habitat protection, exploring possibilities for sourcing funding, further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation, and should seek external advice from appropriate experts. Some resources may be required to support stakeholder participation (e.g. travel expenses from other islands).

6.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. A toll-free hotline may be of utility. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies.*
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CFD has the capacity to collect, necropsy and document all strandings.*



Photo 6.22. Leatherback turtle with satellite transmitter attached (Photo BVI CFD).

- c) Raise awareness through a dedicated campaign to sensitise Islanders to the importance of protecting the nests of such small nesting populations, and to encourage reporting of any illegal take of eggs or nesting females.
- d) Develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.
- e) Ensure school participation in any rookery monitoring programmes to sensitise children to the importance of rookery protection.

6.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the British Virgin Islands

- a) Raise awareness among BV Islanders of the presence of distinct foraging and nesting turtle populations through informational materials, web sites and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.
- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of awareness-raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop BVI specific turtle-related educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.



Photo 6.23. Contributing to BVI CFD Environmental Summer School (Photo B. Godley)

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An Assessment of the Status and Exploitation of Marine Turtles in the Cayman Islands





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

7. Status and Exploitation of Marine Turtles in the Cayman Islands

Contents	Page
7.1. Summary and Recommendations	125-128
7.2. Geographic Overview	129
7.3. Historical Overview	129
7.4. Organisations Involved with Marine Turtles in the Cayman Islands	129-130
7.5. Status of Nesting Marine Turtles in the Cayman Islands	130-133
7.5.1. Data from nesting beach monitoring	130
7.5.2. Data from TCOT socioeconomic questionnaire	130-131
7.5.3. Threats	131-132
7.5.4. Genetics of nesting turtles	132
7.5.5. Nesting overview	132-133
7.6. Status of Foraging Marine Turtles in the Cayman Islands	133-139
7.6.1. Monitoring efforts	133-136
7.6.2. Overview of species present	136
7.6.3. Spatial patterns in relative abundance	137
7.6.4. Trends in abundance	137
7.6.5. Threats	138
7.6.6. Genetics of foraging populations	138-139
7.6.7. Foraging overview	139
7.7. Direct Use of Marine Turtles in the Cayman Islands	139-148
7.7.1. Overview	139-140
7.7.2. Harvest of adults on the nesting beach	140
7.7.3. Harvest of eggs	140-141
7.7.4. Harvest at sea	141-143
7.7.5. Trade in shells and shell products	143
7.7.6. Incidental catch in marine fisheries	143
7.7.7. The Cayman Turtle Farm	144-148
7.8. Indirect Use	148-150
7.8.1. Turtle watching on beaches	148
7.8.2. Dive/snorkelling tourism	148-149
7.8.3. Aquaria holding captive turtles	149
7.8.4. Other marketing/cultural uses	149-150
7.9. Attitudes to Conservation	150-151
7.10. Capacity Building and Outreach Activities During TCOT	151-152
7.10.1. Capacity building and outreach activities	151
7.10.2. Outreach activities	152
7.11. Acknowledgements	153
7.12. References	153-154

7.1. Summary and Recommendations

Summary

At least two species of marine turtle (green and loggerhead turtles) nest in the Cayman Islands but in critically low numbers (see table 7.1). Much needs to be done to ensure the continued existence of marine turtles nesting in the CI and facilitate their recovery. Foraging marine turtles (green and hawksbill turtles) are widespread in CI coastal waters and appear to be locally abundant at some sites, despite having been subject to direct exploitation for a long period of time. Direct exploitation still occurs at much reduced levels but targets large individuals, a significant proportion of which are likely to be part of the breeding population. Local authorities have advised that this fishery should be discontinued as turtle meat which is so important in Caymanian culture is available from cultured stocks from the Cayman Turtle Farm (CTF). Indirect exploitation of turtles and their image is higher in the Cayman Islands than in any of the other OTs.

Summary of Recommendations

TCOT recommends that the Government of Cayman Islands takes all necessary steps to ensure the sustained existence of nesting and foraging populations of marine turtles in Cayman Islands and facilitate their recovery. This will require actions under the following general headings:

7.1.1. Increase capacity for marine turtle management

7.1.1.1. Increase the capacity of the Cayman Islands Department of Environment (CIDoE).

7.1.1.2. Establish a multi-stakeholder marine turtle management process.

7.1.2. Amend legislation and policy to facilitate marine turtle population recovery

7.1.2.1. Revise harvest legislation.

7.1.2.2. Increase the network of Protected Areas in the Cayman Islands.

7.1.2.3. Enact Endangered Species Trade and Transport Law.

7.1.3. Continue and enhance systematic monitoring of marine turtle populations to determine trends in abundance

7.1.3.1. Continue systematic monitoring efforts at nesting beaches throughout the three Islands.

7.1.3.2. Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes at a range of in-water study sites for both green and hawksbill turtles around the Cayman Islands.

7.1.3.3. Undertake limited night time beach monitoring for identification and genetic sampling adult nesting green turtle females.

7.1.3.4. Consideration be given to acting as a regional training centre.

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	Small numbers possibly increasing	Adults and juveniles present. Large numbers of juveniles in some areas	Licensed turtle fishery present at reduced levels targeting large juveniles and adults Low level of illegal take on the nesting beach and at sea. Low levels of illegal egg take
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Very small numbers possibly extirpated	Adults and juveniles present Large numbers of juveniles in some areas	Still present at reduced levels targeting large juveniles and adults Low level of illegal take at sea Egg take unlikely
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Occasional nest	Rarely encountered	Unlikely
Loggerhead Turtle (<i>Caretta caretta</i>)	Small numbers	Rarely encountered	Licensed turtle fishery present at reduced levels targeting large juveniles and adults Low level of illegal take on the nesting beach and at sea Low levels of illegal egg take

Table 7.1. Marine turtle species present and summary of exploitation in the Cayman Islands.

7.1.4. Maximise the role of the Cayman Turtle Farm in marine turtle conservation

7.1.5. Establish further conservation and awareness programmes to sensitise those living in and visiting Cayman Islands to marine turtle conservation requirements

7.1.5.1. Encourage and implement sensitive practices at existing nesting beaches.

7.1.5.2. Implement general awareness programmes regarding marine turtle conservation in the Cayman Islands.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific Recommendations

7.1.1. Increase capacity for marine turtle management in Cayman Islands

TCOT has significantly contributed to the skills and technical knowledge of the CIDoE officers. Although CIDoE are relatively well resourced in OT terms, additional resources would further improve the magnitude and quality of the work currently being undertaken. It is essential that the CIDoE receives adequate resources to effectively carry out their custodianship of Cayman Islands' highly valuable marine and coastal resources, on which the country's economy so heavily depends.

7.1.1.1. Increase the capacity of the CIDoE

It is vital to ensure CIDoE has the capacity, staff and resources to carry out research, monitoring and enforcement duties relevant to marine turtle management, including data collection and analysis for turtle monitoring programmes. CIDoE staff are well trained and highly motivated, but have

a limited research budget which constrains current efforts. It is recommended that national and international funding is sourced to support ongoing research and monitoring efforts as the work being carried out in the Cayman Islands is potentially of profound regional importance and CIDoE has the capacity to match support.

a) Increased presence in Cayman Brac/Little Cayman

Given the importance of Little Cayman as a foraging and nesting site, and that Cayman Brac has recently been discovered to host nesting and foraging populations of unknown magnitude, but has long been a centre of turtle exploitation, it is recommended that CIDoE have a more significant presence on these sister islands. Although CIDoE have one enforcement officer for each of the two Islands, it would seem that, at minimum, a sister islands field base and sufficient operating resources are warranted to facilitate more extensive research, monitoring and community outreach by DoE scientific staff.

7.1.1.2. Establish a multi-stakeholder marine turtle management process

To date there have been 5 years of dedicated marine turtle research on wild marine turtles in the Cayman Islands and marine turtle conservation and management in the Cayman Islands is now of significant public interest. It is essential that public compliance with marine turtle management measures continues and, to facilitate such compliance, it is necessary that stakeholders feel they have meaningful input into the decision-making progress.

It is therefore recommended that the CIDoE coordinate a Marine Turtle Working Group to include representatives of relevant stakeholders (e.g. government agencies and departments such as CIDoE, CTF, Planning and Tourism; NGOs such as CI National Trust; hoteliers; dive operators etc.). The working group should meet regularly to discuss marine turtle management issues and to provide input to government's management and regulatory processes. The group would also function as a public education resource, promoting marine turtle conservation and informing their respective stakeholder groups on marine turtle management issues.

7.1.2. Amend legislation and policy to facilitate marine turtle population recovery

It is felt by CIDoE that data from their ongoing inwater monitoring provide convincing evidence that the fishery should be closed and they have made such a recommendation to the Marine Conservation Board (G. Ebanks-Petrie (CIDoE) pers. comm. 2004). Available data suggest the fishery, although small, as currently structured is likely to be affecting nesting population recovery. TCOT recognises that cessation of all turtle fishing would significantly contribute to the recovery of depleted marine turtle populations in the Cayman Islands. TCOT also recognises that turtle meat is a component of the traditional Caymanian diet, but that in the Cayman Islands, turtle meat can be obtained from farmed stocks. Complete closure of the traditional turtle fishery may, however, be deemed politically and socially unacceptable.

At minimum, it is recommended regulations governing the traditional harvest be altered.

In addition, the Cayman Islands' turtles face a host of threats imposed by the growing human population (2.71%, 2004 est.), and the regulation of utilisation alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations regarding legislation and policy changes to facilitate protection of critical marine turtle habitat in the Cayman Islands.

7.1.2.1. Harvest legislation recommendations:

While the Cayman Islands have relatively sophisticated regulations to monitor marine turtle harvest, this harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in turtle abundance. TCOT makes the following recommendations:

- a) Prohibit the capture of all adult marine turtles in Cayman waters. Ensure permanent and complete prohibition of the harvest of reproductively active turtles by extending the closed season to include the 1st of April to the 30th of November inclusive.
- b) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.
- c) Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length stipulated in any amended legislation.
- d) Ensure prohibition of the harvest of loggerhead and leatherback turtles. The CIDoE have also expressed that they would recommend prohibition of any future take of hawksbill turtles.

7.1.2.2. Increase the network of Protected Areas in the Cayman Islands

a) Key nesting sites should be given protected status

At present, none of the key nesting beaches in the Cayman Islands is afforded protected status. It is recommended that key nesting sites for marine turtles are given a high level of protection from the deleterious effects of inappropriate coastal development. While there is currently no legislation to implement this recommendation, the Draft National Conservation Law would provide the necessary legal framework. Therefore, TCOT recommends the immediate enactment of this law.

b) Key foraging sites should be given protected status

Based on the ongoing and recommended expanded inwater monitoring programme, key foraging sites not already protected should be given protected status to ameliorate the effects of coastal development and recreational use. In so

doing, it is likely that key coral reef and seagrass habitats will be preserved. The Draft National Conservation Law would provide a comprehensive framework for management of protected areas and species.

7.1.2.3. Endangered Species Trade and Transport Law

TCOT recommends that the CIDoE be adequately resourced to implement the provisions of the recently enacted Endangered Species Trade and Transport Law, and that the necessary commencement orders be issued by Cabinet as soon as possible. When this legislation comes into effect, it will fully transpose CITES to domestic law.

7.1.3. Continue and enhance systematic monitoring of marine turtle populations to determine trends in abundance

Cayman Islands hosts nesting populations of green, loggerhead and hawksbill turtles and foraging populations of greens and hawksbills. The Cayman Islands' nesting turtle populations are remnant and at critically low levels; indeed the hawksbill nesting population may be extirpated. Trends in abundance will only be determined by long-term systematic monitoring. In order to understand the conservation status of these populations and inform effective conservation management, it is vital to work towards establishing data that will reveal any trends in their abundance. TCOT therefore recommends the continuation and expansion of the following monitoring programmes, under the guidance of the CIDoE, as a matter of priority:

7.1.3.1. Continue systematic monitoring efforts at nesting beaches throughout the three Islands

The CIDoE currently runs an exemplary monitoring program that has been in operation for 6 years in Grand and Little Cayman. Given the recent discovery of nesting on Cayman Brac, survey efforts have been expanded to Cayman Brac. The main aims of such monitoring in all three islands would be to determine nesting abundance trends, monitor hatching success, describe threats and facilitate genetic analysis of nesting populations through nest excavation and sampling.

7.1.3.2. Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes at a range of in-water study sites for both green and hawksbill turtles around the Cayman Islands

Enhancing ongoing work, this would be carried out around all three of the Cayman Islands to allow the detection of temporal patterns of abundance, and to facilitate genetic sampling to further determine trends in genetic stock composition of green and hawksbill turtle populations. Surveillance for fibropapillomatosis should continue to be incorporated.

7.1.3.3. Undertake limited night time beach monitoring for identification and genetic sampling of adult nesting green turtle females

Given the large financial investment previously made in the CTF headstarting operation, it is highly recommended that CTF support the CIDoE's nocturnal monitoring to

allow a fuller appreciation of the impact of the headstarting experiment to be ascertained.

7.1.3.4. Consideration be given to acting as a regional training centre

The combined inwater and nesting monitoring programme of the CIDoE would be an excellent training platform for a range of interns, including fisheries officers, from throughout the wider Caribbean region.

7.1.4. Maximise the role of the Cayman Turtle Farm in marine turtle conservation

The Cayman Turtle Farm (CTF) is ideally and uniquely suited to promoting the conservation of marine turtles in the Cayman Islands. One key area is in the maximization of the proportion of production that is sold to local people. Since recent production cuts at the CTF, there has been a relative scarcity of turtle meat relative to demand. This has an intrinsic potential to drive the trade in both legal and illegally captured turtle meat from the wild. It is strongly advised that, where possible, production is increased and/or re-routed towards the local market, whether it be through supermarkets or restaurants catering largely to local people, in preference to those most frequented by island visitors. It is recommended that the sale of farmed turtle products be controlled under the Trade and Transport Law to prevent illegal trade in wild turtle products through commercial establishments.

7.1.5. Establish further conservation and awareness programmes to sensitise those living in and visiting Cayman Islands to marine turtle conservation requirements

Increased awareness of turtles and their conservation requirements in the Cayman Islands can provide short- and long-term mitigation against the threats faced by marine turtles due to development. TCOT recommends the following actions, to be implemented under the guidance of the CIDoE, to facilitate public contribution to marine turtle conservation:

7.1.5.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Continue coordinating the established network of hoteliers, beach residents and other beach users to ensure swift reporting of nests so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergences. Key issues to be addressed are lighting, vehicular traffic, and the use of heavy beach cleaning equipment.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CIDoE has the capacity to collect, necropsy and document all strandings. This network could be supported by a toll-free hotline.

- c) Raise awareness through the continuation and expansion of the campaign to sensitise Caymanians to the importance of protecting the nests of such small nesting populations and to encourage reporting of any illegal take of eggs or nesting females.
- d) Update and expand distribution of guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.
- e) Ensure continued enhanced school participation in relevant marine turtle conservation programmes to sensitise children to the importance of rookery protection.

7.1.5.2. Implement general awareness programmes regarding marine turtle conservation in the Cayman Islands

- a) Raise awareness among Caymanians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation, and MEA's.
- c) Enhance existing CIDoE programme of awareness raising presentations and workshops in local communities, schools and other public fora.
- d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop Cayman Islands specific turtle-related educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.



Figure 7.1. Map of Cayman Islands.

7.2. Geographic Overview

The Cayman Islands (Fig 7.1.) are a group of three islands: Grand Cayman, Little Cayman and Cayman Brac. They have a land area of 259 km², 207 km of coastline, and a population of 43,103 growing at 2.71% (2004 est.). The economy is second only to Bermuda among the 6 OT's involved in TCOT, with a GDP per capita of US\$35,000 (2002 est., statistics from CIA World Fact Book <http://www.cia.gov/>). With no direct taxation, the islands are a thriving offshore financial centre. Tourism is also a mainstay, with over 2.1 million visitors in 2003.

7.3. Historical Overview

Historically, nesting marine turtles were abundant in the Cayman Islands (Williams 1995), with a large migrant population of green turtles reproducing between May and October on both Grand Cayman and Little Cayman (Lewis 1940; Parsons 1984). When Christopher Columbus discovered the islands in 1503, he named them "Las Tortugas" (Spanish: the turtles). His expedition recounted that the islands were:

"full of tortoises, as was all the sea about, insomuch as that they looked like little rocks."

Murray (1991) reports that, while stopping off at Tortugas en route to Florida in 1564, the English slave-trader Sir John Hawkins recorded:

"These Islands beare the name of Tortoises, because of the number of them, which there do breed, whose nature is to live both in the water and upon land also, but breed onely upon the shore; in making a great pit wherein they lay egges, to the number of three or foure hundred, and covering thm with sand, they are hatched by the heat of the Sunne; and by this meanes commeth the great increase. Of these we tooke very great ones, which have both backe and belly all of bone, of the thicknes of an inch; the fish whereof we proved, eating much like veale; and finding a number of egges in them, tasted also of them, but they did eat very sweetly."

The population was so large that authors have suggested that the Cayman Islands may have been the largest rookery for the green turtle in the Caribbean (Groombridge & Luxmoore 1989; King 1982; Jackson 1997).

Turtle fishing later came to form the basis of the economy and culture of the Islands, providing a rich food source and means of livelihood for several centuries. Indeed, this easily attainable resource was what originally attracted people to the islands, which were first colonised in the mid 1600's, with turtle fishing becoming the main local industry. By 1688, 40 sloops from Jamaica were engaged full time, with sources suggesting shipments of 13,000 turtles a year (King 1982). The level of take was undoubtedly unsustainable and by the late 1700s nesting turtles of the Cayman Islands were no longer a significant commercial resource. The population

was thought to have been completely extirpated by the 20th Century, but it appears that a remnant population has persisted (see Aiken *et al.* 2001a; 2001b, Bell & Austin 2002 and references therein).

By the early 1800s, Caymanian turtle fishers were sailing to Cuba, then to the Miskito Cays, Nicaragua to catch turtles (Lewis 1940; Parsons 1984). The Caymanian turtle fleet operated in this manner, largely sustaining the local economy, until tourism overtook as the major industry in the 1970s. Parsons (1962; 1984) suggests that the inhabitants of Cayman Brac were traditionally hawksbill fishers using "trap nets" while those in Grand Cayman focussed largely on the green turtle. Presumably, the green turtle take involved targeting nesting turtles on beaches as well as using "set nets" that were subsequently used in the Miskito Keys (Parsons 1984).

7.4. Organisations Involved with Marine Turtles in the Cayman Islands

There are two main organisations concerned with marine turtles in the Cayman Islands.

7.4.1. Cayman Islands Department of Environment

The responsibilities of the Cayman Islands Department of Environment (CIDoE) are broad, encompassing research, monitoring, advisory, enforcement, and education. There is a staff complement of 31: Director; 2 Assistant Directors (Operations; Research & Assessment); Research Manager; Senior Research Officer (Aquaculture & Fisheries); Environmental Assessment Officer; 5 Research Officers; 2 Special Projects Officers; Marine Parks Maintenance Supervisor; 2 Marine Parks Maintenance Officers; 2 Technical Assistants; Marine Technician; Chief Marine Enforcement Officer; Marine Enforcement Supervisor; 9 Marine Enforcement Officers; Executive Officer; Administrative Officer. The overall operating budget estimate for 2004-2005 was CI\$2,848,469 (T. Austin (CIDoE) pers. comm. 2004). The CIDoE currently operates 13 vessels and 11 road vehicles in support of Research, Marine Enforcement, and Marine Parks Operations in Grand Cayman, Little Cayman, and Cayman Brac.

The CIDoE has played a pivotal role in research, conservation, and management of wild marine turtles in the Cayman Islands since 1998, when the Marine Turtle Research Project was initiated with support of a grant from the UK Foreign and Commonwealth Office. Currently, research is carried out using the extensive field experience of the CIDoE and the collaborative academic expertise of the Marine Turtle Research Group at the University of Exeter in Cornwall. Through TCOT support, the CIDoE greatly expanded the range and scope of existing initiatives. As the agency responsible for research, public education, and management of the natural environment in the Cayman Islands, the CIDoE will ensure that TCOT recommendations and results are presented to the public and considered in the relevant policy decisions.

	Grand Cayman					Little Cayman					Cayman Brac
	1999	2000	2001	2002	2003	1998	2000	2001	2002	2003	2003
Green	1	18	2	43	18	9	9	3	8	4	0
Loggerhead	18	25	27	12	31	0	0	5	1	4	12
Hawksbill	2	0	0	0	0	2	0	0	0	0	0
Unidentified	2	2	1	9	1	4	2	0	2	0	0
Total	23	45	30	64	50	15	11	8	11	8	12

Table 7.2. Overall magnitude of nesting in the Cayman Islands since monitoring began in 1998 in Little Cayman and 1999 in Grand Cayman Islands.

7.4.2. Cayman Turtle Farm

As a key part of the exploitation of turtle products in the Cayman Islands, a detailed profile of the Cayman Turtle Farm is given in Section 7.7.7.

7.5. Status of Nesting Marine Turtles in the Cayman Islands

7.5.1. Data from nesting beach monitoring

The following information is distilled from a paper in preparation by Catherine Bell (CIDoE) *et al.*:

A total of 27 beaches covering 37 km of Grand Cayman's 129km of coastline have been identified as suitable for marine turtle nesting based on beach morphology and composition, and information from historical records and anecdotal reports. The Grand Cayman coastline has been monitored during the reproductive season from 1999 – 2004 (Photo 7.1). In Little Cayman the survey has been carried out in 1998, and every year commencing 2000. Sixteen beaches covering 18km of coastline were identified as suitable for marine turtle nesting habitat. In Cayman Brac, sporadic and reactive monitoring of its limited nesting

habitat began in 2003 in response to reports of marine turtle activity in these areas. Table 7.2 summarises nesting data gathered to date. There has been no recorded hawksbill nesting in the Cayman Islands since 1999 and it is possible that the hawksbill nesting population on the Cayman Islands may have been extirpated. Although nesting in every year, green (Photo 7.2) and loggerhead (Photo 7.3) nesting are at critically low levels and continued monitoring will give insights into trends in nesting numbers. Individual nests are followed through to hatching or failure and excavated to assess success (Photo 7.4).

7.5.2. Data from TCOT socioeconomic questionnaire

Although systematic nesting beach monitoring by the CIDoE was only instigated in 1998, some insight can be obtained from past egg collectors. As part of the TCOT SEQ, 2 former egg collectors expressed their views that, in general, marine populations had declined. However, one thought that nesting turtles, especially loggerheads, had increased in the last 5 years. This same observer also felt that hawksbill nesting had continued to decline in the last 5 years.

All questionnaire respondents were also asked about perceptions of change in nesting numbers over time (in the last 5 years and since they can remember), both

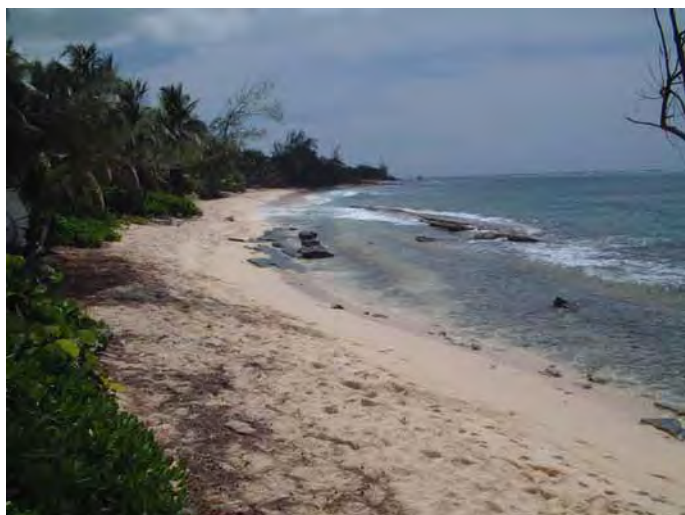


Photo 7.1. Relatively undeveloped beaches persist in the Cayman Islands (Photo P. Richardson).



Photo 7.2. Green turtle nesting (Photo M. Orr).



Photo 7.3. Raking over loggerhead turtle track (Photo P. Richardson).



Photo 7.4. Nest excavation (Photo B. Godley).

in general and for specific species (Q105a-b). Twenty respondents noticed changes, 78 did not, and 12 did not answer the questions. For those who did notice change, for each species and in general, more people believed turtle nesting was decreasing versus increasing, in the past 5 years and since they can remember. For example, for turtles in general, 4 people believed nesting numbers had increased in the last 5 years, as opposed to 10 who believed they had decreased. Three believed they had increased since they could remember, and 10 believed they had decreased. Perceptions of species decline and increases are summarised in Table 7.3 below.

Respondents were asked about reasons for the perceived increase or decrease, both in the number of turtles nesting and found in OT waters (reasons were not distinguished by habitat). Responses (offered by 29 respondents) varied, with no single explanation dominating. Reasons cited for decreases included: over-fishing or inappropriate fishing methods, increased demand, environmental pressure, overpopulation, cultural traditions, over-consumption and storm damage. Reasons for increases included: conservation efforts, law and the turtle farm.

7.5.3. Threats

The following anthropogenic threats to adult turtles, their eggs and hatchlings have been documented by the CDoE and reviewed by Solomon (1998):

1. Fisheries capture (via legal turtle licenses; see Section 7.7.4)
2. Illegal fishing of adults (via hand capture and illegal set nets).
3. Illegal collection of eggs
4. Egg predation by domestic dogs

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	2	9	0	4	5
Leatherback	1	4	1	8	6
Loggerhead	3	6	0	7	4
Hawksbill	1	6	1	8	4
General	4	10	1	6	0

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	2	8	0	4	4
Leatherback	0	5	1	7	7
Loggerhead	1	8	0	6	5
Hawksbill	0	8	1	6	5
General	3	10	1	7	0

Table 7.3. Perceptions of changing abundance of sea turtles nesting in Cayman Islands, in the last 5 years and since respondents can remember (n=20 respondents who noticed change).

5. Hatchling misorientation due to inappropriate beach lighting (Photos 7.5 and 7.6)
6. Nests being placed at risk by heavy beach cleaning equipment
7. Beach erosion
8. Coastal armouring and other physical obstacles on beaches
9. Loss of native vegetation

The CIDoE has a substantial enforcement capacity and does bring prosecutions for illegal activities (Section 7.7.4). It has an extensive liaison with property owners, media and community groups, including schools, to help ameliorate other threats (J Solomon (CIDoE) pers. comm. 2004).

7.5.4. Genetics of nesting turtles

TCOT genetic analyses has shown that the haplotypes of nesting samples collected in the Cayman Islands have also been described in a number of other nesting sites and foraging areas (see section 10.4.4).

For farmed green turtles, haplotypes described in the Cayman Turtle Farm have also been found in the

foraging areas of Anguilla, Bahamas, Barbados, BVI, Montserrat, Nicaragua, TCI, USA and West Africa. These same haplotypes have also been described from **nesting** aggregations in Costa Rica, Mexico, USA and Venezuela. **For wild green turtles**, haplotypes described in nesting turtles/hatchlings from the Cayman Islands have been described from **foraging** grounds in Bahamas, Barbados, Nicaragua and USA. These same haplotypes have also been described from **nesting** aggregations in Costa Rica, Mexico, USA and Venezuela.

For hawksbill turtles no genetics vouchers were collected.

For loggerhead turtles, haplotypes described in nesting turtles/hatchlings from the Cayman Islands have been described from **foraging** grounds in Panama and the Eastern Atlantic, but have also been described at **nesting** colonies in Greece, Mexico, and the USA.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004 and more definitive answers will be available at that point. Despite the small size of the nesting populations in the Cayman Islands and the limited sampling to date, previously undescribed haplotypes were described for both green and loggerhead turtles. This highlights the likelihood that Cayman Islands may host its own discrete nesting populations with limited immigration/emigration, underlining the importance for protection. Data will be disseminated as part of the recently funded cross-territory Overseas Territories (OTEP) project which will focus on Turtles and the Environment Charter and Multilateral Environment Agreements.

7.5.5. Nesting overview

Although once large, the populations of turtles nesting in the Cayman Islands may be genetically unique and are critically small. Indeed, the hawksbill turtle nesting population may be extirpated. Anthropogenic threats faced include direct and indirect capture and a range of factors related to coastal development.

Recommendations

7.1.2.2. Increase the network of Protected Areas in the Cayman Islands

a) Key nesting sites should be given protected status

At present, none of the key nesting beaches in the Cayman Islands is afforded protected status. It is recommended that key nesting sites for marine turtles are given a high level of protection from the deleterious effects of inappropriate coastal development. While there is currently no legislation to implement this recommendation, the Draft National Conservation Law would provide the necessary legal framework. Therefore, TCOT recommends the immediate enactment of this law.



Photo 7.5. Green turtles misorientated by lights and then killed by road vehicles (Photo CIDoE).



Photo 7.6. Nests in highly developed sites are caged to protect against misorientation and damage (Photo CIDoE).

7.1.3.1. Continue systematic monitoring efforts at nesting beaches throughout the three Islands

The CDoE currently runs an exemplary monitoring program that has been in operation for 6 years in Grand and Little Cayman. Given the recent discovery of nesting on Cayman Brac, survey efforts have been expanded to Cayman Brac. The main aims of such monitoring in all three islands would be to determine nesting abundance trends, monitor hatching success, describe threats and facilitate genetic analysis of nesting populations through nest excavation and sampling.

7.1.3.3. Undertake limited night time beach monitoring for identification and genetic sampling adult nesting green turtle females

Given the large financial investment previously made in the CTF headstarting operation, it is highly recommended that CTF support the CDoE's nocturnal monitoring to allow a fuller appreciation of the impact of the headstarting experiment to be ascertained.

7.1.5.1. Encourage and implement sensitive practices at existing nesting beaches

- a) *Continue coordinating the established network of hoteliers, beach residents and other beach users to ensure swift reporting of nests so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies. Key issues to be addressed are lighting, vehicular traffic, and the use of heavy beach cleaning equipment.*
- b) *Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CDoE has the capacity to collect, necropsy and document all strandings. This network could be supported by a toll-free hotline.*
- c) *Raise awareness through the continuation of the campaign to sensitise Caymanians to the importance of protecting the nests of such small nesting populations and to encourage reporting of any illegal take of eggs or nesting females.*
- d) *Update and expand distribution of guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.*
- e) *Ensure continued and enhanced school participation in relevant marine turtle conservation programmes to sensitise children to the importance of rookery protection.*

7.6. Status of Foraging Marine Turtles in the Cayman Islands

7.6.1. Monitoring efforts

CDoE co-ordinated in-water survey work, with remote guidance offered by MTRG before and during the TCOT project. **Janice Blumenthal and Catherine Bell of CDoE write:**

The Cayman Islands Department of Environment has been carrying out an in-water monitoring project since 2000. Sampling was undertaken from May 2000 to August 2002 and bi-monthly following initiation of the TCOT project. To date, over 160 juvenile hawksbill turtles and 35 juvenile green turtles have been captured on foraging grounds in Grand Cayman and Little Cayman. During each capture occasion, data are collected on location, capture depth and habitat type, Catch Per Unit Effort, turtle morphometrics, size frequencies, recaptures (for capture-mark-recapture modeling), and incidence of lesions suggestive of fibropapillomatosis. Turtles are sampled for blood (serum and red blood cells – RBC's), tissue, and epibionts.

Many aspects of sea turtle population dynamics remain unevaluated, hampering conservation efforts. Basic demographic parameters such as sex ratio, growth rate, habitat utilisation, and foraging behaviour must be elucidated in order to model population dynamics and evaluate risks to threatened populations. Initial monitoring efforts have uncovered great geographic variability, necessitating the study of regional index populations. As identified at the West Atlantic Green Turtle Population Modelling Workshop (Bolten & Chaloupka 2004), the Cayman Islands are ideally situated to provide a robust reference point for marine turtle population biology in the Western Caribbean.

The following techniques are being used:

i) Modified Mark and Recapture using Snorkel Tow

Hawksbills, and to a lesser extent green turtles, are hand-captured in foraging habitat by snorkellers towed approximately 30 feet behind a small boat (Photo 7.7). Capture depth, weather and sea conditions, capture habitat, turtle activity on sighting, Catch Per Unit Effort (CPUE), and other parameters are evaluated during each capture occasion. This methodology was demonstrated to participants during the TCOT workshop (2002), and has now been adopted in other Overseas Territories. Captures in CI to date include:

Hawksbills: 82 foraging hawksbills have been captured in Grand Cayman and 79 in Little Cayman (Total: 161);
Green turtles: 32 foraging green turtles have been captured in Grand Cayman and 3 in Little Cayman (Total: 35).

All captured turtles are tagged according to standard protocols to prevent collection of duplicate genetic samples and to elucidate demographic parameters. Metal Inconel tags are applied to the posterior edge of each front flipper and Passive Integrated Transponder (PIT) tags are injected into the shoulder muscle (Balazs 1999). Weight, straight



Photo 7.7. Catching a juvenile hawksbill turtle (Photo P. Richardson).

carapace length, width, depth, plastron length, and tail measurements are recorded for turtles on capture and following each recapture. Scales and calipers are calibrated prior to all capture days. Morphometric data are collected for all foraging turtles. Skin biopsies are obtained from a rear flipper with a sterile 4-millimetre biopsy punch and preserved in a buffer solution of 20% dimethyl sulfoxide (DMSO) saturated with Sodium Chloride (NaCl) (Dutton 1996). Samples are collected from all captured turtles.

To collect blood for sex determination, turtles are restrained head-down while 5-10 ml samples are collected from a dorsal cervical sinus (Owens *et al.* 1980) using a 21-gauge needle and an evacuated blood-collecting tube (Dutton 1996). Blood samples for sex determination are collected in Sodium Heparin vials (to prevent coagulation of the blood) and are centrifuged upon return from field to separate serum from red blood cells (RBCs). Serum is stored at -70°C pending analysis by Radioimmunoassay (Diez & van Dam 2003), and RBCs are archived for stable isotope analysis.

Samples collected to date include: Hawksbills: 47 serum samples have been collected from foraging hawksbills in

Grand Cayman, and 35 in Little Cayman; Green turtles: 6 serum samples have been collected from foraging green turtles in Grand Cayman and 2 in Little Cayman.

ii) Transect Surveys

Transect surveys have been conducted in lagoonal and reef habitats. Capture-Mark-Recapture and transect surveys are performed in order to collect data on foraging population abundance and distribution. Transect methodology has been adapted from reviews in Bjorndal and Bolten (2000) and habitat classification methodology from Kendall *et al.* (2001). Distribution and habitat information will be incorporated into GIS mapping of benthic habitat. Habitat and marine turtle abundance data are collected for 66 transect lines.

iii) Aerial Surveys

Aerial surveys are in progress to facilitate an evaluation of habitat use and trends. To date, 4 trial/training flights have been conducted in order to standardize survey methodology, sightings, and recording. Following finalisation of technique, bi-monthly flights will be conducted.

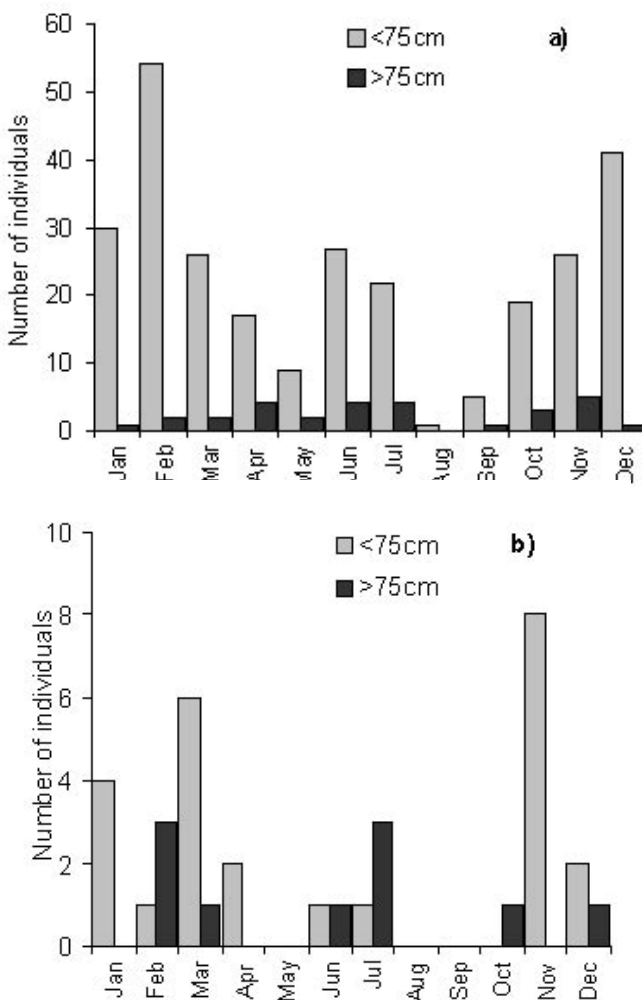


Figure 7.2. Temporal distribution of sighting of a) hawksbill and b) green turtles in the Cayman Islands. Pale bars represent individuals of <75cm in carapace length estimated by observers. Dark bars represent those >75cm, considered adults.

Species	<25	26-50	51-75	>76	Unknown	Total	Site
Green	1	20	4	10	3	38	2,14,18,32,39,50,63,69,70,71,83, 85, 86,97,106,112,118, 127,144
Hawksbill	47	177	53	29	13	319	2,4,5,6,8,10,12-17,20,23-25,29-31,33,35,37-40,42,45,47-49, 52-61, 63-65,69-71,74-76,78,79,81-83, 85, 87, 89-95, 98, 104, 106,109,110, 112-120,122,125,127,128,131-134,136,137,141v
Loggerhead	0	0	1	0	0	1	31
Unidentified	0	13	7	3	5	28	2,22, 29, 36,42,69,85,106, 127, 132, 141

Table 7.4. Summary of species and size class of individuals turtles observed by divers in the Cayman Islands 1 September 2002 – 26 November 2003. Key to locations: 14 Trees ¹, Anchor Point ², Andes Wall ³, Aquarium ⁴, Armchair Reef ⁵, Babylon ⁶, Balboa ⁷, Barracuda bight ⁸, Bears Paw ⁹, Big Dipper ¹⁰, Big house ¹¹, Big Sister ¹², Big Tunnel ¹³, Black Forest ¹⁴, Black Hole ¹⁵, Black Rock ¹⁶, Black Rock Shallow ¹⁷, Blackie's Hole ¹⁸, Blue Peter ¹⁹, Bonnie's Arch ²⁰, Breakers Cut ²¹, Bus Stop ²², Caribbean Sand Chute ²³, Chain Reef ²⁴, Charlie's ²⁵, Cheeseburger reef ²⁶, Chinese Garden ²⁷, Christina's Wall ²⁸, Chubb Hole ²⁹, Cinderella's Castle ³⁰, Coconut Wall ³¹, Crushers Wall ³², Cumbers Cove ³³, Delilah's Delight ³⁴, Doc Polson ³⁵, Donna's Delight ³⁶, Dreamweaver ³⁷, Eagle Ray Pass ³⁸, Eagle Ray Round Up ³⁹, Eagle's Nest ⁴⁰, Eden Rock ⁴¹, Fish Tank ⁴², Gail's Mountain ⁴³, Gails Reef ⁴⁴, Ghost Mountain ⁴⁵, Governor's Reef ⁴⁶, Great House Wall ⁴⁷, Great Wall ⁴⁸, Great Wall East ⁴⁹, Great Wall West ⁵⁰, Grouper Grotto ⁵¹, Grundy's Gardens ⁵², Hammerhead Hill ⁵³, Harbour Heights ⁵⁴, Hepp's Wall ⁵⁵, High Rock ⁵⁶, Hole in the Wall ⁵⁷, Hyatt Drop Off ⁵⁸, Ironshore Garden ⁵⁹, Jack McKinney's ⁶⁰, Jackson Wall and Reef ⁶¹, Japanese Garden ⁶², Joy's Joy ⁶³, Julie's Wall ⁶⁴, Kangaroo Gorge ⁶⁵, Kelly's Cavern ⁶⁶, Keno ⁶⁷, Kent's Caves ⁶⁸, La Mesa ⁶⁹, Lea Leas Lookout ⁷⁰, Lemon Reef ⁷¹, Leslie's Curl ⁷², Lighthouse Wall ⁷³, Little Bluff Reef ⁷⁴, Little House on the Prairie ⁷⁵, Little Tunnel ⁷⁶, Long Point Seven Mile Beach (N) ⁷⁷, Lost Valley ⁷⁸, Maggie's Maze ⁷⁹, Main Street ⁸⁰, Marilyn's Cut ⁸¹, Meadows ⁸², Middle Sister ⁸³, Mitch Millers Reef ⁸⁴, Mixing Bowl ⁸⁵, Mountain ⁸⁶, Nancy's Cup of Tea ⁸⁷, Ned's Tunnel ⁸⁸, No Name Wall ⁸⁹, Northern Lights ⁹⁰, NW Point Drop Off ⁹¹, Old Wreck Head ⁹², Omega Reef ⁹³, Orange Canyon ⁹⁴, Ore Verde ⁹⁵, Paradise Reef ⁹⁶, Paradise Wall ⁹⁷, Pat's Wall ⁹⁸, Peppermint Reef ⁹⁹, Pirate's Caves ¹⁰⁰, Playing Fields ¹⁰¹, Princess Penny's Pin ¹⁰², Public Beach ¹⁰³, Public Beach North between 3 Tree and Bolters ¹⁰⁴, Queens Throne ¹⁰⁵, Randy's Gazebo ¹⁰⁶, Red Bay Caves ¹⁰⁷, Red Bay Caves W ¹⁰⁸, Ridgefield reef ¹⁰⁹, Ringer Wall ¹¹⁰, Rivers of Sands ¹¹¹, Robert's Wall ¹¹², Round Rock ¹¹³, Royal Palm's Ledge ¹¹⁴, Sand Chute W ¹¹⁵, Sarah's Set ¹¹⁶, Scuba Bowl ¹¹⁷, Seaview Reef ¹¹⁸, Sheer Wall East ¹¹⁹, Silver Sands ¹²⁰, Smith's Cover ¹²¹, Snapper Hole ¹²², Soto's Reef ¹²³, Splash House ¹²⁴, Split Rock ¹²⁵, Stingray Alley ¹²⁶, Sunset Reef ¹²⁷, Tarpon Alley ¹²⁸, Tarpon Alley (E) ¹²⁹, The Edge ¹³⁰, The Maze ¹³¹, The Pinnacles ¹³², The Wharf ¹³³, Three B's ¹³⁴, Three Trees ¹³⁵, Tolero ¹³⁶, Trinity Caves ¹³⁷, Turtle Farm ¹³⁸, Turtle Pass ¹³⁹, Turtle Reef ¹⁴⁰, Valley of the Dolls ¹⁴¹, Whitestoke ¹⁴², Wildlife Reef ¹⁴³, Jackson's Bay ¹⁴⁴.

iv) Net-based Surveys

Initial attempts at in-water capture of green turtles employed several unmonitored set nets and a 500-foot entrapment net deployed from the stern of a small outboard boat. Initial efforts resulted in 17 green turtle captures, and beginning in summer 2004, an intensive capture effort will be initiated using monitored set nets, with the aim of collecting 50-100 samples from foraging green turtles in the Cayman Islands.

v) Use of Caribbean Turtlewatch

Caribbean Turtlewatch surveys were conducted in the Cayman Islands between September 1, 2002, and November 26, 2003. Seven dive operators on Grand Cayman (including the CDoE) and 3 dive operators on Little Cayman took part in the survey. During this time 521 check forms were completed, detailing 521 check dives over 144 dive sites around the two islands. On 244 dives, no turtles were seen and on the other 277 dives, 386 turtle sightings were recorded. A total of 319 hawksbill, 38 green, 1 loggerhead and 28 unidentified turtle sightings were logged. On 196 occasions only 1 turtle was seen, on 54 occasions 2 turtles were seen, and on 5 occasions 4 turtles were seen. See table 7.4 for a summary of species and size class of individuals observed.

The most frequently sighted turtle in the Cayman Islands is the hawksbill turtle (83% of total sightings). Green turtles were also observed on occasion (10% of total sightings). Only 1 loggerhead sighting was recorded, and no leatherback turtles were sighted in Cayman waters. Green and hawksbill turtles commonly reside on Cayman's reefs and seagrass beds, and it is therefore more likely that they would be sighted by divers.

The months during which individuals were observed are given in table 7.5. In addition, data on the temporal distribution of hawksbill and green turtle sightings are presented in figure 7.2.

Divers completing Caribbean Turtle Watch forms were asked the question: *Did the chance of seeing a turtle influence your decision to choose this particular dive?* Of 310 responses to this question, 110 were positive, 185 responses were negative and 12 were unsure.

When asked the question: *How important was your turtle sighting to the enjoyment of the dive?* 205 felt it was very important, 90 felt it was important and 11 replied that the sighting of a turtle did not influence their enjoyment of the dive.

	Green		Hawksbill		Loggerhead		Unidentified		Total
Month	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	
Jan	4	0	30	1	0	0	0	0	35
Feb	1	3	54	2	0	0	0	0	60
Mar	6	1	26	2	0	0	0	0	35
Apr	2	0	17	4	0	0	1	0	24
May	0	0	9	2	0	0	2	0	13
Jun	1	1	27	4	0	0	0	0	33
Jul	1	3	22	4	0	0	0	0	30
Aug	0	0	1	0	0	0	0	0	1
Sep	0	0	5	1	0	0	1	0	7
Oct	0	1	19	3	0	0	0	0	23
Nov	8	0	26	5	1	0	1	0	41
Dec	2	1	41	1	0	0	0	0	45

Table 7.5. Temporal distribution of observations of all species in the Cayman Islands. Juveniles are classed as those <75cm in carapace length and possible adults those >75cm.

These answers show that, although the majority of divers are not selecting dive sites in the hope of seeing a turtle (possibly a reflection of the low numbers of turtles in Cayman waters and the consequent difficulty in being able to guarantee a sighting at any site), once sighted, turtles are highly appreciated by most divers. Data presented should be considered preliminary and will be given a full and detailed analysis by Catherine Bell (CIDoE) who will explore the utility of this approach whilst discussing many of the potential sources of bias.

7.6.2. Overview of species present

The Cayman Islands host relatively large foraging aggregations of immature hawksbill and green turtles. CIDoE in-water capture surveys, *Caribbean Turtlewatch*,

and formal and informal interviews during the course of TCOT Socioeconomic Questionnaire (SEQ) suggest that Grand Cayman, Little Cayman, and Cayman Brac provide developmental habitat for juvenile hawksbill and green turtles, while mature turtles are observed exclusively during the summer breeding and nesting season. Hawksbills captured during CIDoE in-water surveys ranged from 22.7 - 61.9 cm Straight Carapace Length (n=161), while green turtles ranged from 24.5 - 53.0 cm (n=37). These size classes are indicative of post-pelagic juveniles and sub-adults, confirming the role of the Cayman Islands as a developmental habitat. Loggerhead turtles are rarely observed in Caymanian waters, despite the Islands hosting a small nesting population. Undoubtedly these adults are only seasonal migrants.

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	2	5	0	0	1
Leatherback	0	3	0	1	7
Loggerhead	0	5	0	1	5
Hawksbill	2	5	0	0	4

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	1	6	0	0	4
Leatherback	0	3	0	1	7
Loggerhead	0	5	0	1	5
Hawksbill	1	6	0	0	4

Table 7.6. Fishermen's perceptions of changing abundance of sea turtles found in OT waters, in the last 5 years and since they can remember (n=8 fishermen who noticed change).

In the last 5 years...					
	Increasing	Decreasing	Same	Don't know	NR
Green	12	14	1	9	0
Leatherback	0	10	1	17	7
Loggerhead	3	16	0	13	2
Hawksbill	7	15	1	10	1
General	4	15	1	11	4

Since you can remember...					
	Increasing	Decreasing	Same	Don't know	NR
Green	7	17	1	8	2
Leatherback	0	9	1	16	9
Loggerhead	1	15	1	12	6
Hawksbill	3	15	3	9	5
General	3	16	1	10	5

Table 7.7. Perceptions of changing abundance of sea turtles found in OT waters, in the last 5 years and since respondents can remember (n=35 respondents who noticed change).

7.6.3. Spatial patterns in relative abundance

The Cayman Islands support an extensive system of back-reef lagoons, providing habitat for foraging juvenile green turtles. Seagrass beds within the lagoons are primarily composed of turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*) and shoal grass (*Halodule wrightii*), along with several genera of green algae, including *Halimeda*, *Penicillus* and *Rhizochephalus* (Roberts 1994). Surveys to date indicate that the southerly South Sound and the eastern edges of the North Sound lagoon provide key seagrass habitats for green turtles. Additionally, green turtles have been documented on exposed western algal foraging grounds. Hawksbill turtles have been documented in colonised hard-bottom areas, patch reef, and the vertical reef wall, with key habitat occurring in Bloody Bay, Little Cayman, and Western Grand Cayman. These areas have been designated index sites for intensive monitoring and abundance estimation via Capture-Mark-Recapture (CMR) modelling.

7.6.4. Trends in abundance

Trends in abundance on index sites (key foraging areas) will be evaluated via CMR modelling, which allows estimation of absolute abundance. The CJS (Cormack-Jolly-Seber) modelling approach is a multiple sequential modelling technique used for derivation of apparent survival (ϕ – probability of surviving and remaining in the study area) and temporal recapture probabilities (p) of marked individuals in an open population. Preliminary CJS population estimates for foraging grounds in Little Cayman and Grand Cayman have been conducted via the program MARK (White & Burnham 1999) to establish the viability of the approach, and precision and reliability of estimates can be confirmed when sample size has increased.

End of section by Blumenthal and Bell.

Answers provided by fishers as part of the SEQ suggest that turtle populations have decreased over time. Four turtle fishers provided their views on the temporal patterns of marine turtle abundance in Cayman waters. Three turtle fishers felt there has been a general decrease in marine turtle numbers in both the short (5 years) and long term (since they started fishing). One believed turtle numbers had increased in the past 5 years. All respondents were asked their opinions on changes in abundance of turtles overall and for each species, in the short and long term (section 9, Q104a-c). Views of fishers, 8 of whom noticed change while 3 did not, are isolated in table 7.6, while views of all respondents are shown in table 7.7.

Of 106 respondents to TCOT SEQ, 35 perceived a change, while 59 did not, and 12 did not respond. As with nesting turtles, the number of people perceiving a decline in numbers exceeded the number of people perceiving an increase, for all species, and for both time periods. For example, over the last 5 years for turtles in general, 4 respondents perceived an increase in the number of turtles in water, while 15 perceived a decrease. Since they can remember, 3 respondents perceived an increase and 16 perceived a decrease. Results for individual species and turtles in general are shown in table 7.7.

Respondents were asked about reasons for the perceived change, both in the number of turtles nesting and in water. Responses (offered by 29 respondents) varied, with no single explanation dominating. Reasons cited for decreases included: over-fishing or inappropriate fishing methods, increased demand, environmental pressure, overpopulation, cultural traditions, over-consumption and storm damage. Reasons for increases included: conservation efforts, law and the turtle farm.

Measures of direct exploitation	Past	Present	Never	NR or NA
By life stage				
Females on beaches	0	0	-	-
Eggs from beach	3	0	-	-
Turtles in water (intentional)	4	4	-	-
Turtles in water (incidental)	6	-	-	-
By product				
Meat				
Fishers who sell meat	1	2	-	-
Meat vendors	2	9	-	-
Meat consumers	24	42	40	-
Eggs				
Collectors who sell eggs	0	0	-	-
Egg vendors consumers	0	0	-	-
Egg consumers	3	7	96	-
Non-edible				
Fishers who sell shells	1	1	-	-
Shell vendors	1	1	-	-
Shell consumers	22	4	80	-
Measures of indirect exploitation				
Turtles indirectly used in business	21			
Total interviews	106			

Table 7.8. Numbers of TCOT SEQ respondents involved in exploitation, by exploitation category. Key NR- No Response, NA - Not Applicable.

7.6.5. Threats

The following anthropogenic sources of mortality or injury have been documented by the Cayman Islands Department of Environment:

1. Fisheries capture (via legal turtle licenses)
2. Illegal fishing (via hand capture and illegal set nets)
3. Boat strike (fatal propeller wounds to carapace and limbs)
4. Entanglement in monofilament fishing line (leading to fatal tissue necrosis; Photo 7.8)
5. Ingestion of fishhooks and helium balloons

Pollution and nutrient enrichment are also of concern in the Cayman Islands, as incidence of fibropapillomatosis disease may be correlated with poor water quality. Additionally, coral bleaching, anchor damage, sedimentation, and dredging have the potential to compromise marine turtle habitat in the Cayman Islands. On a broader scale, preliminary genetic studies (TCOT genetics section) indicate that juvenile hawksbills in the Cayman Islands originate from a range of Caribbean jurisdictions. Therefore, exploitation on nesting beaches and adult foraging grounds in other areas could significantly impact foraging aggregations in the Cayman Islands.

7.6.6. Genetics of foraging populations

TCOT genetic analyses have shown that the haplotypes of foraging turtles in the Cayman Islands have also been described in a number of other nesting and foraging sites (see section 10.4.4).



Photo 7.8. Hawksbill killed as a result of entanglement (Photo CIDoE).

For wild green turtles sampling is now underway by DoE. **For hawksbill turtles** haplotypes described in **foraging** turtles in the Cayman Islands have been described from **foraging** grounds in Anguilla, BVI, Cuba, Mexico, Montserrat, Puerto Rico, and TCI. These haplotypes have also been described from **nesting** aggregations in Antigua, Barbados, Belize, Brazil, Mexico, Cuba, Puerto Rico, USVI.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004 and more definitive answers will be available at that point. At this point, however, it can be clearly highlighted that the turtles foraging in Caymanian waters will undoubtedly include those originating from a number of nesting colonies across the Caribbean region. Detailed information will be disseminated as part of the recently funded cross-territory Overseas Territories (OTEP) project that will focus on Turtles and the Environment Charter and Multilateral Environment Agreements.

7.6.7. Foraging overview

It is likely that only green and hawksbill turtles forage in Cayman waters where there are pockets of abundance of both species.

Recommendations

7.1.2.2. Increase the network of Protected Areas in the Cayman Islands

b) Key foraging sites should be given protected status

Based on the ongoing and recommended expanded inwater monitoring programme, key foraging sites not already protected should be given protected status to ameliorate the effects of coastal development and recreational use. In so doing, it is likely that key coral reef and seagrass habitats will be preserved. The Draft National Conservation Law would provide a comprehensive framework for management of protected areas and species.

7.1.3.2. Establish sustainable, regular and frequent (monthly), constant-effort monitoring programmes at a range of in-water study sites for both green and hawksbill turtles around the Cayman Islands

Enhancing ongoing work, this would be carried out around all three of the Cayman Islands to allow the detection of temporal patterns of abundance, and to facilitate genetic sampling to further determine trends in genetic stock composition of green and hawksbill turtle populations. Surveillance for fibropapillomatosis should continue to be incorporated.

7.7. Direct Use of Marine Turtles in the Cayman Islands

7.7.1. Overview

The main domestic legislation that covers turtle use is the Marine Conservation (Turtle Protection) Regulations (1996 Revision), which is fully reviewed in Section 3. In summary, the laws of the Cayman Islands protect eggs and nesting females and maintain turtle harvests at sea to a limited licensed traditional take within a geographically restricted open season. The CIDoE have 10 enforcement officers working throughout the 3 islands, and enforcement is considered effective, but not absolute. Through informants, enforcement officers are aware of infringements of laws that occur despite possible penalties of fines of up to CI\$500,000 or 1 year imprisonment. Although there are few records or accounts of prosecutions for turtle related offences, in August 2004 an individual was fined CI\$1,000 for slaughtering a wild green turtle, which included \$500 for possession and \$500 for slaughter without inspection by a Fisheries Officer (T. Austin (CIDoE) pers. comm. 2004). A second case is pending trial in Cayman Brac. Marine Park Regulations and Marine Conservation Laws are publicised in an attractive pamphlet (Appendix 7.1) that outlines the location and rules for limited use areas, as well as summarising the regulations in easily accessible language. The TCOT SEQ revealed reasonably high awareness of laws regulating marine turtle fishing; over 50% of respondents reported their awareness of laws, and most of these could provide specific examples of restrictions.

Data on use of marine turtles were gathered by combining published information, that provided by project partners and the data gathered using the TCOT Socioeconomic Questionnaire or SEQ (See Section 2). In Cayman, 106 questionnaires were completed and a breakdown of how much information gathered on marine turtle exploitation is digested in the Table 7.8.

Methods

The TCOT SEQ was administered in Cayman Islands by community college students. Preparation involved training of teaching staff in week 1, and student training in week 2, which included a briefing and practice administration. In week 3, teaching staff carried out an overview and problem-solving session in advance of student administration in week 4. It appears, however, this was not sufficient to allow all of the students to negotiate some of the more difficult parts of the questionnaire. While some questionnaires were completed correctly, it is evident that administration protocol was not followed rigorously in many instances. One problem in particular is pertinent to the following exploitation report, and is described here. The TCOT team had made the decision to allow pleasure fishers to 'opt out' of section 3 (for fishers), with pleasure fishing defined in contrast to fishing undertaken as a means of supporting oneself (for food or cash). While we imagined that some pleasure fishers might incidentally hook a sea turtle now and again, we felt having them complete a long section of the survey, most of which would not be relevant to them, was undesirable. We also imagined that there would be few 'pleasure' turtle fishers.

However, 4 people who identified themselves as pleasure fishers went on to complete section 4 of the survey, designed for turtle fishers. There are two possible explanations for this. First, the first question of section 4 asks respondents if they catch turtles intentionally, opportunistically, or both, and all 4 people responded 'opportunistically'. These pleasure fishers may have misunderstood opportunistically to mean incidentally (and college students may have been unable to explain that the section was not relevant to them). Second, it may be that some pleasure fishers do opportunistically catch sea turtles, though this would at first seem unlikely given the illegal nature of the activity and the fact that there may be some difficulty in hiding sea turtles at public landing site. We have included these 4 fishers in the discussion below.

7.7.2. Harvest of adults on the nesting beach

In the Cayman Islands, it is strictly illegal to take nesting females during the nesting season as:

1. turtles taken as part of the legal fishery must be captured outside the reef crest and;
2. the closed season encompasses the recorded nesting season of both green and loggerhead turtles and is likely to encompass the majority of hawksbill turtle nesting, although there are very few nests from this species.

Some illegal take of nesting females is thought to still occur (G. Ebanks-Petrie (CIDoE) pers. comm. 2004), possibly at a low level. Indeed, one such attempt was thought to have recently been foiled where a nesting green turtle was discovered turned and tied to a tree by CIDoE staff during beach monitoring. The turtle was released under police supervision (Photo 7.9). It transpires that the turtle had been captured under the misunderstanding that a temporary lifting of the protective legislation, which had been instigated to allow recapture of the escaped Cayman Turtle Farm stock in the wake of Hurricane Michelle, had still been in place. CTF paid the turtler who had previously been paid for recoveries of escaped farm stock (J. Parsons (CTF) pers. comm. 2004). None of the interviewees in the TCOT SEQ reported catching nesting turtles at any time.



Photo 7.9. Green turtle released under police supervision (Photo CIDoE).



Photo 7.10. Tags and license for use in turtle fishery (Photo CIDoE).

7.7.3. Harvest of eggs

Despite being illegal, taking of eggs still occurs. CIDoE staff have 9 reliable records of clutches of eggs having been taken since 2000 (n=1 green turtle nest), 2002 (n= 3 green turtle nests; n =2 unknown species) and 2003 (n=3 nest of unknown species). It is felt that this is undoubtedly an underestimate as surveillance is less intense on Little Cayman and Cayman Brac, and nest poachers are thought to camouflage their own tracks and those of the turtle laying the clutch to minimise the chance of detection.

Nesting levels in the Cayman Islands are very low (Aiken *et al.* 2001a; 2001b; Bell & Parsons 2002) and it is thought that only a minority are subject to egg poaching, thus the total number of eggs involved is not large. The mechanism and prices involved in any sale of eggs is not yet assessed, but suffice to say that the take and sale of sea turtle eggs is not a significant economic activity. If information provided by past egg collectors holds true today, it is most likely that eggs collected are used for personal consumption.

In the TCOT SEQ, no interviewees reported current egg collecting although we received data from 3 former egg collectors (2 from Cayman Brac and 1 from Grand Cayman). Two of these ceased egg collection approximately 25 years ago when they became aware it was illegal and another reported stopping in 1990 following an incident when he was nearly caught by Police. It appears from the testimony of these 3 interviewees that the eggs of all three hardshell species were collected. Two interviewees expressed a preference: hawksbill turtle eggs (n=1; more eggs per nest) and green turtle eggs (n=1; better tasting). Two of the three interviewees offered opinions as to the pattern in abundance of nesting turtles, and their views are isolated from the general population of respondents. One responded that nesting numbers in general had decreased over the past 5 years and since he could remember. The other responded in general, and for specific species. In general, he believed nesting numbers had increased in the past 5 years, but decreased since he could remember. He described the same trend for loggerhead turtles specifically.

Year	Month	Spp	Mass (lbs)	Mass (kg)	sex	Capture method
1999	Apr	L	154	70.0	U	U
2000	Nov	G	U	U	U	U
	Dec	G	U	U	U	U
	Dec	G	155	70.5	U	trap net
	Dec	U	U	U	U	U
	Apr	L	350	159.1	U	U
	Apr	H	98	44.5	U	U
2001	Jan	G	240	109.1	U	U
	Apr	G	180	81.8	M	U
	Apr	G	300	136.4	M	trap net
	Apr	H	110	50.0	U	trap net
2002	Feb	G	130	59.1	F	trap net
	Feb	H	105	47.7	U	trap net
2003	Mar	G	>100	>45.5	U	U
	Nov	H	120	54.5	U	U
	Apr	G	225	102.3	M	trap net
	Apr	H	110	50.0	F	trap net
	Apr	H	110	50.0	M	trap net
	Mar	H	85	38.6	U	set net
	Apr	H	82.5	37.5	U	set net
	Nov	H	90	40.9	F	set net
	Nov	G	264	120.0	M	trap net
2004	Apr	H	85	38.5	F	trap net
	Apr	G	200	91	M	U
	Apr	G	>200	>91	M	trap net
	Apr	L	>200	>91	M	trap net
	Apr	G	280	127	M	trap net
	Apr	G	>200	>91	M	trap net

Table 7.9. Data on legally captured marine turtles in the Cayman Islands 1999-2004. Data Courtesy of CI DoE (Key G: Green turtle; H: Hawksbill turtle; L: Loggerhead turtle; U: Unknown species, sex or fishing method of capture; M: Male; F: Female).

However, he believed that hawksbill turtles had decreased during both time periods. The lack of a significant economy in turtle eggs is somewhat supported by the fact that none of the three former egg collectors reported ever having sold eggs. Of 7 former egg consumers, only 2 had opinions as to temporal trends in availability; both considered that egg availability had decreased in the short and the long term. Three respondents reported they were current consumers of sea turtle eggs, but no further information was proffered.

7.7.4. Harvest at-sea

A traditional marine turtle fishery still exists in the Cayman Islands, which has been a license-only fishery since 1978. The open season is 1st November-30th April. There are 20 individuals with the right to apply for a marine turtle fishing license; 14 of these are current and 8 have taken turtles since 1998 (5 in Cayman Brac and 3 in Grand Cayman; C. Bell (CIDoE) pers. comm. 2004). The other eligible fishers do not have licenses at this time and therefore cannot fish for turtles. Eligible licensees are individuals from families which have a long tradition of turtling. Licenses are non transferable and under the current legislation, the fishery will die with the last of the 20 traditional turtle fishers.

Under this system, each fisher is allowed to take no more than 6 turtles per season and each turtle must be greater than 120lbs (54.5kg) if a green turtle, or greater than 80lbs (36.4kg) if a loggerhead or hawksbill turtle. Turtles must be taken outside the reef crest using traditional methods only (set net, trap net). Harpoons or spear-guns are specifically prohibited. Upon capture, licensed fishers are required to place an individually numbered tag that is issued with license (Photo 7.10) on a captured turtle and report it to a fisheries officer before slaughter. Fisheries officers are not limited to CIDoE officers and are appointed by the Marine Conservation Board. The fisheries officer checks and records the details of the license under which the turtle has been taken, the weight and sex of the turtle, the area and date of the capture, and the number of tags the license holder has remaining. Where possible, genetic vouchers are obtained.

Formal data recording has only been instigated in recent years, but the data in Table 7.9. show that green (at least 50%), loggerhead (at least 11%) and hawksbill turtles (at least 36%) are all taken. Estimates made by marine enforcement officers and marine turtle fishers suggest that since 1986 approximately 10 large turtles are taken legally per year. In addition, however, more than 10 are thought to be taken

illegally per year by licensed turtle fishers, by those who would be eligible for, but do not possess a current license, and by others (Aiken *et al.* 2001a; C. Bell (CIDoE) pers. comm. 2004). This illegal take includes nesting females, undersized turtles, turtles taken outwith the season, or captured in prohibited areas. Illicit harvest still occurs despite legally available turtle meat from the Cayman Turtle Farm, demonstrating the magnitude of desire for turtle meat in the Cayman Islands.

As can be seen in Figure 7.3., 16 of the 22 reported captures occurred in April. This is the time of the year when many breeding adults in the Caribbean are undertaking their breeding migrations and individuals of the Caymanian nesting populations will be moving into the waters for mating. There is thought to be a delay of the order of 1 month between mating and the first egg-laying of the season, with marine turtle nesting in the Cayman Islands beginning in May. Given the closed season is currently designed to protect adults, extending the closure to include April would better accomplish its aim of protecting the Caymanian breeding turtle population.

Since events at the CTF following Hurricane Michelle, at least 3 relatively freshly butchered green turtle carapaces have been found in secluded areas around the island by CIDoE staff. Although these could be resultant from illegal take at sea, they could also be turtles stolen from CTF during the Hurricane and from Jackson's Pond. The latter is used as a temporary holding facility for a large number of farm turtles since the Hurricane and until construction on the new facility is complete (anticipated end 2005).

A total of 14 fishers in the TCOT SEQ reported catching marine turtles in the past or present. Of these, 8 have intentionally captured turtles whilst 6 report catching them accidentally as part of other fishing activities (see section 7.7.5). Of the 8 turtles fishers, 4 had since stopped fishing for turtles; 2 gave reasons: 1) Changes in the law and poor health; 2) Concerns for the environment. Of the 4 current turtle fishers, 2 identified themselves as intentional fishers, 1 as both intentional and opportunistic and the fourth as only opportunistic. Methodologies used included capture by hand (n=1) and nets (n=2). Four of the 8 fishers (2 fishing in the past and 2 in the present) also identified themselves as pleasure fishers only (see methods note, section 7.7.1.1).

Information on number and size of turtles caught was limited, as only 1 current fisher provided estimates. He reported capturing 2000 green turtles per year, but not all from Cayman Islands. The survey administrator failed to have the fisher distinguish between local and other fishing. No fishers provided data for any other species.

The meat from the legal harvest is widely thought to be kept for personal use on family occasions or gifted and is considered of great cultural importance, with license holders having fished for turtles all their lives as did their forefathers (C. Bell (CIDoE) pers. comm. 2004). However, of the 4 present turtle fishers who responded to the TCOT SEQ, 2

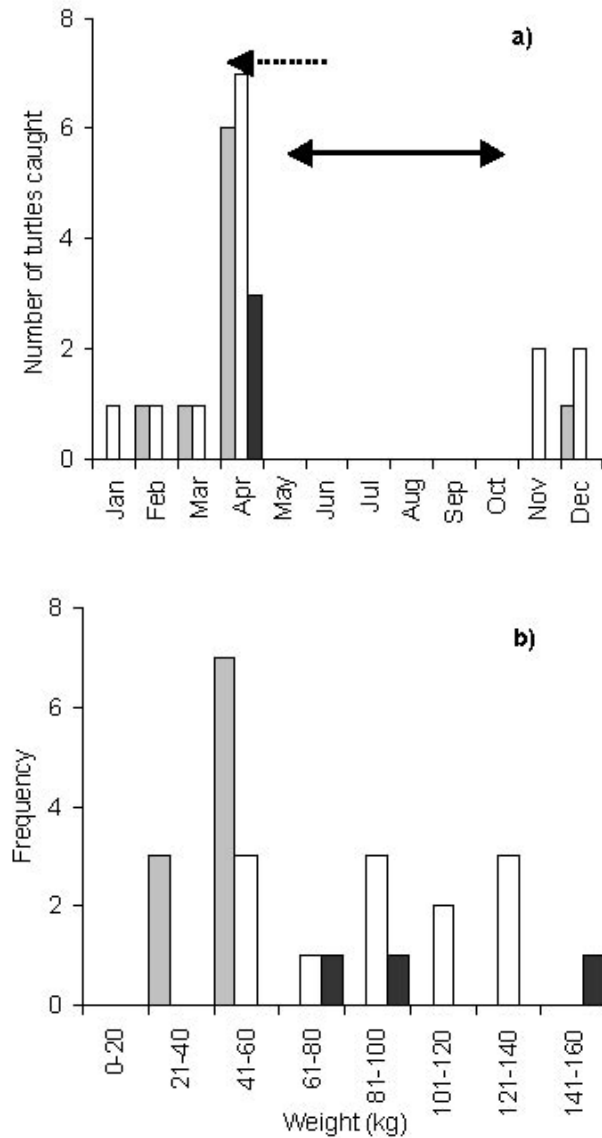


Figure 7.3. All reported capture data from the Cayman Islands legal fishery April 1999-April 2004. **a)** Temporal distribution of all reported captures. Dashed line indicates the likely start of the mating season (one month prior to the first nesting) and consequent entrance of adults into Cayman waters. Solid line describes the extent of the Cayman Island nesting season. **b)** Weight distribution (kgs) of all reported captures. Most weight records were taken as an estimate at the time of capture. Where a range was presented by a fisherman or enforcer, the lowest estimate was used. Key: *E. imbricata*: grey boxes, *C. mydas*: white boxes, *C. caretta* black boxes.

(1 from Grand Cayman and 1 from Cayman Brac) reported selling the meat). One suggested the going price was CI\$6 per turtle (although we suspect this is a translation error for a per lb price), and 1 suggested he received CI\$6 per lb (the latter of these is 1 of those who identified himself as a pleasure fisher). That he sells meat and filled out all parts of section 3 and 4 suggest that in this case, it was the initial categorization as a pleasure fisher that was incorrect.

While price was reported by only 2 current fishers, the reported price for marine turtle meat from wild turtles is comparable with that of Cayman Turtle Farm stew and

Menavelins (see section 7.7.7. below). Both fishers stated that the price rarely changed, with 1 respondent suggesting the price was set by fishers and another suggesting it was defined by local consumers.

The economic importance of turtle fishing varies across respondents. For past turtle fishers (n=4), 2 rated turtle fishing their most important catch before they stopped, while 2 did not respond to the question. For current fishers, only 1 ranks turtle fishing as his most important economic activity. Two others rank it 3rd and 4th, while 1 current fisher did not answer the question. Given the small number of fishers legally licensed, and the suspected small number of illegal fishers, the harvest probably does not play a significant role in the economy of the Cayman Islands. Indeed, this can be said for the whole commercial fishing sector. There are currently only 2 vessels that could be considered part of the commercial fishery. These fish the offshore banks (Misteriosa, Rosalind, Serranna, 60 mile) and supply fish to local restaurants. They contribute to the majority of the livelihood of only 4 fishers (P. Bush (CIDoE) pers. comm. 2004).

7.7.5. Trade in shells and shell products

Trade in shell and related products is not a major enterprise in the Cayman Islands other than when operated by the Cayman Turtle Farm (see section 7.7.7. below). Only 2 fishers identified themselves as selling shells as by-products of capture for meat; 1 in the past and 1 in the present. Other than the Cayman Turtle Farm, no current vendors were identified.

7.7.6. Incidental catch in marine fisheries

Although there are few commercial fishers in the Cayman Islands, fishing is important and guide-fishing for tourists targeting bone fish and tarpon is prevalent. The majority of these operations are believed to be 'catch-and-release' and are considered as 'sport fishing' in that the catch in no way supplements household incomes although guiding fees will contribute significantly to some. Of these, there are 10-20 based in Grand Cayman and 1 based in Little Cayman. Additionally the recreational fishing sector is large, numbering up to 400 unlicensed boats. Although this does not constitute the major part of the earnings of any individuals, catch supplements the income of many.

Incidental catch is considered as minimal within Caymanian waters. The commercial fishing industry is very small and no records of interactions with the game fishing industry have been recorded by CIDoE. Anecdotal evidence, however, suggests that occasionally turtles (usually reported to be juvenile green turtles but including occasional hawksbills) are hooked accidentally whilst fishers line fish. There have been two recent incidences of this in the North Sound, and on each occasion it was reported that more than 1 turtle was taken (C. Bell (CIDoE) pers. comm. 2004).

Data from the TCOT SEQ suggest that bycatch may be more prevalent than previously thought. Six of 12 fishers who contributed to the TCOT SEQ reported catching turtles



Photo 7.11. CTF yearling turtles (Photo B. Godley).



Photo 7.12. Feeding turtles in growing tanks (Photo B. Godley).

accidentally as part of other fishing activities; with estimates ranging between 1 and 2 turtles per year per fisher. When asked which turtles they catch most often, 3 fishers identified greens, 2 identified loggerheads, and 1 identified hawksbills. Fishers were also asked what other turtles they caught incidentally, and an equal number identified greens, loggerhead, and hawksbills. Data suggest that turtles captured are usually alive. Methodologies likely to interact with turtles were line based methods (n=6) and net fishing (n=1). All six fishers said that they release turtles when captured with 4 giving reasons: legality (n=3); dislike of taste (n=1). When asked about other fishers, 4 of the 6 respondents thought that other fishers kept accidentally caught turtles and only 1 thought that in general fishers release them. Given the number of fishers suggesting they catch turtles accidentally using line and hook, and the number of pleasure fishers who suggested they captured turtles 'opportunisticly' (and may have met accidentally), the incidence of accidental catch of turtles by pleasure fishers could be high and warrants further investigation.

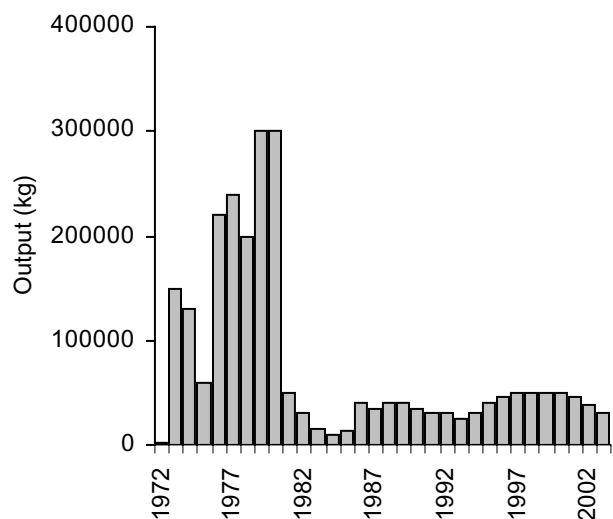


Fig 7.4. Output (kg) of edible product from the Cayman Turtle Farm 1972-December 2003 (Data courtesy of Cayman Turtle Farm).

7.7.7. The Cayman Turtle Farm

i. Introduction

The Cayman Turtle Farm has been in operation since 1968 as a commercial venture to raise green turtles. To form the herd, eggs, adults and sub-adult turtles were collected from the wild. A minimum of 477,644 eggs were collected from Ascension Island, Costa Rica, Guyana, and Suriname between 1968 and 1978. Additionally, 60 adults were collected from Ascension Island, Costa Rica, Guyana, and Suriname, between 1968 and 1973. A further 117 adults and sub-adults were obtained from Mexico between 1976-1977, and 31 individuals of adult size (24 females and 7 males) were purchased from Caymanian fishing boats fishing the Miskito Keys of Nicaragua between 1970 and 1971 (Cayman Turtle Farm 2002).

Breeding adults are held in a large breeding pond next to an artificial nesting beach. Eggs from each clutch laid on the beach are incubated in a hatchery (Critchley *et al.* 1983; Wood & Wood 1979) and hatchlings are reared in groups (Photos 7.11 and 7.12). Animals selected for release are in excess of what is required for local use and future breeding stock, and have in the past equated to ca. 10-15% of annual production (Cayman Turtle Farm 2000). The stock level has varied over the years, and by 2001 the breeding herd stood at 355 (94 males, 261 females) and mean annual production of hatchlings from 1980-2001 was 10,500. In November 2001, Hurricane Michelle caused severe damage to the Farm and 78% of the breeding stock was washed out to sea. Since then, a new facility has been built further inland. The Cayman Turtle Farm continues to provide meat for local consumption and remains one of the major tourist attractions on Grand Cayman.

ii. Product Utilisation and Distribution

Animals are reared to slaughter typically at 4-5 years of age when they weigh 27-36kg (60-80lb). As a way of maintaining the product output with less turtles since Hurricane Michelle, slaughter animals have typically been older and heavier: 7 years old and of the order of 45kg (100lb) in weight.

Typically, animals are slaughtered and butchered on site 4 days per week. In general, 60% of the edible product is sold wholesale to 2 outlets: Farmers Market and Foster's Supermarket. The additional 40% is sold retail to 8 restaurants, CTF, staff and a small number of individuals, and some is donated as charitable gifts to the local retirement home, a special-needs day care centre, sports and service clubs, religious fundraisers and other charitable events.

Carcasses are processed into:

1. Steaks: Eight ounce pieces of filleted meat.
2. Stew: Packaged mixture containing large pieces of meat, fat, liver, lung, calipee (pre-boiled and boned) and can include portions of tail, neck, and flippers minus larger bony elements.
3. Menavelins: Packaged mixture of small cuts of meat, fat, skin, heart, kidney and spleen.
4. Waste: All guts, the carapace and major bony elements of larger turtles are now dumped.

In 2001 CTF applied to register under CITES as a captive breeding operation. The purpose of this registration proposal, concerning carapaces only, was to allow tourists that visit the Cayman Turtle Farm to export carapaces as personal effects. Each carapace processed for sale would have borne a permanently fixed metallic label with the Farm's logo, the ISO country code for the Cayman Islands, a unique number, and year of production. It would also have been accompanied by a CITES permit with a digital photograph of the carapace bearing the unique serial number. At the CITES CoP, Santiago, Chile, November 2002, this proposal failed to reach the required two-thirds majority with a vote of 38 in favour, 24 against and 48 abstentions. Prior to this proposal, a small number of carapaces were prepared for local sale and this practice was discontinued in 2002. However, in 2004 CTF resumed local sale of marine turtle carapaces.

iii. Pattern of Production

The output of edible product from the farm has varied greatly over the years, rising from the start of production in 1972 to a peak of nearly 305 metric tonnes in 1980. With the loss of international markets in the early 1980's, as a result of decisions taken at CITES meetings and the instigating of strict import measures of some importing states, production was reduced (see figure 7.4.). The long-term average 1983-2000 was 34.8 metric tonnes of product per annum, which corresponds to the slaughter of 1500-3000 animals per year with live body weight of the order of 30kg.

There appears to be no marked seasonal variation in demand for turtle meat in the Cayman Islands other than a slightly elevated demand driven by local people towards the end of the year (J. Parsons (CTF) pers. comm. 2004). This is coincidental with the occurrence of the local Pirates Week festival in October and the Christmas/New Year celebrations. Following the damage caused by Hurricane Michelle in November 2001, CTF management

realised that they would need to reduce meat production while management re-assessed its capacity for future productivity. This management measure was instigated in January 2002 (see fig 7.5), with slaughtering of fewer animals per slaughter day, and on only 3 days per week. Additionally, CTF largely ceased retail operations, limiting trade to wholesale partners and the gifts to care institutions and other donations. This production has, however, been incrementally increased since January 2003.

Although greatly reduced from its peak, consumption of turtle food products is prolific. Although our sampling strategy for the TCOT SEQ was not random, the fact that of 106 people interviewed, 42 were current consumers of turtle meat and an additional 24 were past consumers is illustrative of the presence of turtle meat eating in the Cayman Islands. Undoubtedly, the vast majority of turtle consumption occurring in the Cayman Islands is that of farmed product. Of 42 current consumers of turtle meat, 15 purchased at the supermarket, 12 at restaurants, 7 at the Cayman Turtle Farm and 1 “at the harbour”. With regard to this latter case, it is not known if this means purchase of wild meat from a fisher or from a restaurant near the harbour.

iv. Pricing and Patterns of Distribution

Although CTF staff informed us that preferential wholesale rates are given to Fosters Supermarket/Farmers market, the system is geared so that the retail price would be broadly consistent whether the product is purchased from CTF or either retailer.

The prices as of 1st February 2004 for retail from CTF (J Parsons (CTF), pers. comm. 2004) were as follows:

Steak	CI\$9.00 per lb retail
Menavelins	CI\$4.00 per lb retail
Stew	CI\$5.40 per lb retail

Foster's Food Fair Supermarket

On 10 February 2004, a member of CIDoE staff visited Foster's Food Fair Supermarket in Georgetown. There was



Photo 7.13. Staff prepare to distribute turtle meat (Photo CIDoE).

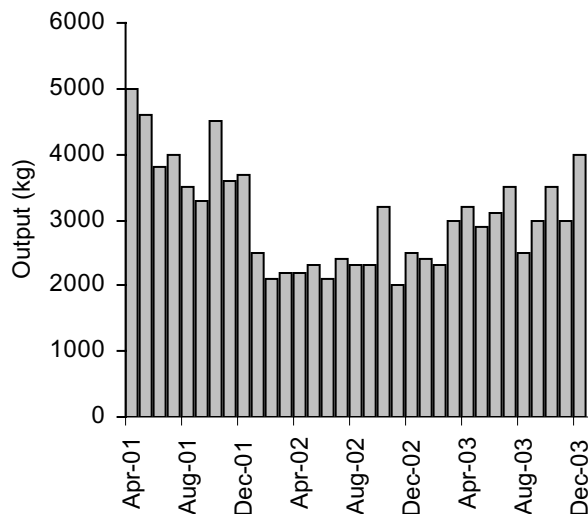


Fig 7.5. Output (kg) of edible product from Cayman Turtle Farm April 2001-December 2003 (Data courtesy of Cayman Turtle Farm).

no turtle meat for sale, but she was informed that Foster's buy 200lbs per week, which it sells at its Republic store (West Bay). In the past, steaks had been sold at a second store at the Strand, West Bay Road (Seven Mile Beach), but this had been discontinued. The third Foster's Supermarket near the airport is close to Farmer's Market and does not retail turtle meat. She was informed that the meat arrives on a Wednesday morning and that, since the post-Hurricane production cuts, it is typically sold out immediately, with people waiting at the door when the store opens. Prior to Hurricane Michelle, Foster's would buy considerably more and it would sell more gradually throughout the week.

On 11 February 2004, a CIDoE staff visited the Foster's Store (Republic - West Bay) and waited in a queue of 8 other people for the opening of store and turtle meat retail. One senior citizen in the queue informed CIDoE that this was the smallest queue she had ever seen and that it usually numbered 20 or more people. About 30 minutes after the store opened the assistants from the meat department wheeled out a trolley full of boxes, and handed these out 1 per person to ensure equity of distribution (Photo 7.13). Staff at the store informed us that this competition for turtle meat had not been an issue before Hurricane Michelle. All meat was sold out within the hour and did not even reach the point of merchandising.

Foster's prices of the 2 turtle products they sell are as follows:

Stew	CI \$27 per 5lb box
Menavelin	CI \$18 per 5lb box.

These prices are very similar to those given by CTF.

Farmer's Market

On 10th February 2004, a member of CIDoE staff visited Farmer's Market in Georgetown and was informed that they sell turtle to the public on Thursday and Saturday mornings. It was pointed out that they only sell what is left

after they fill their orders (of steak/stew and menavalin) for the restaurants, which vary from week to week. They too reported an undersupply versus demand in recent times, with little left for retail to the public and whatever was available in high demand.

Restaurant Sector

A selection of restaurants were contacted to confirm what dishes were sold and the prices per portion of turtle product. These are summarised below:

Liberties	Stew	CI\$10.75	Thursdays only
	Steak	CI\$18.95	Daily to order
Wellies Cool Spot	Stew	CI\$11.00	Fridays only
Vivine's Kitchen	Stew	CI\$16.00	Wednesday
	(part of buffet)		
Bus Side	Stew	CI\$10.00	Friday only
Champion House	Stew	CI\$8.00	Tuesdays only
	Steak	CI\$15.00	Daily to order

In the TCOT SEQ, 9 interviewees identified themselves vendors of turtle meat. Of these, 7 owned or managed restaurants that sold turtle meat. Of these, 5 stated that turtles were important to their business. All 7 have noted a decrease in meat availability over time.

iv. Demand

Our preliminary description of the retail network surrounding edible marine turtle products has shown that there is currently an underproduction versus demand. Overall, of the 42 respondents who currently consume turtle meat, 29 of them answered questions regarding change in availability of products in general (Q101a-c). For meat specifically, 19 respondents commented on trends over the last 5 years, with 15 respondents noticing a decrease and 1 noticing an increase. Eighteen respondents commented on availability since they can remember; 13 perceived a decrease and 1 perceived an increase. CTF recognises that demand has outstripped production during the step down in production since Hurricane Michelle. Production is still on the increase and it is expected that pre-Michelle levels will be reached within the next year.

Did the CTF's pre-Michelle production level satisfy local demand? CTF thinks this is the case (J. Parsons (CTF) pers. comm. 2004). CTF had the potential of markedly increasing production in the years before Michelle should the demand have necessitated. This was not the case and since the mid 1980's production has been relatively constant. Turtle consumption has been integral to the Caymanian culture for centuries and was prevalent before the start-up of the Farm. Indeed CTF purchased a number of animals from the Cayman based fishery catch to bolster its stock of adults in the early 1970s. As the international fishery closed down, CTF production was available to fill the gap and the culture of eating turtle products persisted at a high level.

Does CTF production stimulate a demand which needs to be satiated by a wild harvest? Given the suspected total wild take makes up such a small fraction of Caymanian

turtle consumption, it is felt that in general terms this is unlikely. Our reported observations suggest that since Hurricane Michelle the demand of local consumers is not being fully met. Although monitoring of covert illegal actions is difficult, CIDoE have not reported any marked increase in legal or illegal turtle fishing activities as a result of the reduction in CTF production. A matter of concern, however, would be the likely consequence of long-term reduced production, i.e. whether this would stimulate illegal take from the wild.

Additional points worthy of note include:

1. The retail cost of turtle food products is highly subsidised by the Farm's tourist revenue.
2. The price has varied little in the last decade, thus in real terms this subsidy has been increasing across time.
3. Despite a marked reduction of production and relative scarcity ensuing from Hurricane Michelle, no market forces driven price increase was instituted.
4. Theft of turtles has been recorded from the Cayman Turtle Farm, especially during Hurricane Michelle (K. Hydes (CTF) pers. comm. 2004). Ongoing illegal take from the wild may simply be financially driven by individual misfortune rather than the dynamics of the demand of wild versus cultured turtle meat.

v. Benefits of the Cayman Turtle Farm

Cayman Islands Authorities consider the primary conservation benefit of the Farm to be that making available farmed green turtle meat has proven to be an effective means of filling local demand for turtle meat, and accordingly limiting the impact on wild turtle populations (Cayman Turtle Farm 2002; G. Ebanks-Petrie (CIDoE) pers. comm. 2004). As part of this mission of turtle meat production for cultural preservation, the CTF has become a major employer in Grand Cayman (30 employees) and a significant tourist attraction (340,000 visitors in 2001), and has an extremely high profile in tourist related publications (Photo 7.14). The revenue generated from gate receipts and retail outlets at the CTF significantly subsidises the price of turtle derived food products.

Other than this, how does marine turtle conservation in the Cayman Islands and internationally benefit from the income generated by the CTF?



Photo 7.14. Cayman Turtle Farm promotion in tourist publication.

Locally

Beach Monitoring: Prior to the CIDoE becoming the lead agency responsible for monitoring wild turtle population, CTF responded to reported nesting and was involved with hatchery incubation of eggs considered “doomed”.

Rescue and rehabilitation: The Farm acts as a facility for the rehabilitation of sick and injured wild turtles.

Support to Training Initiatives: CTF has financially supported participation of CIDoE staff in International Sea Turtle Symposia and the Bermuda Turtle Project Annual Training Course. In addition, CTF provided support to the TCOT training workshop held in 2002.

Headstarting: In 1980, CTF initiated a program of releasing juvenile turtles produced and raised on the Farm into the territorial waters of the Cayman Islands; a process often termed “headstarting”. This release programme was set up to determine whether headstarted turtles were capable of surviving in the wild and recruiting to breeding populations. It was also hoped that data could be provided concerning age at sexual maturity, and that returns would provide geographical insights into migration and the selection of nesting and foraging grounds (J. Wood (ex-CTF) pers. comm. 2003). The results of this 22 year study have been analysed with the support of MTRG staff as part of the TCOT initiative, and have been submitted for publication (Bell *et al.* submitted). The abstract of this manuscript follows:

“Headstarting is a management technique employed to enhance recruitment of turtles into diminished or extirpated marine turtle populations. Between 1980 and 2001, 16,422 hatchlings and 14,347 “yearling” green sea turtles were released from the Cayman Turtle Farm. Approximately 80% of all turtles released were subject to some form of tagging, including living tags. A total of 392 tagged animals have been recaptured at intervals of up to 19 years. Of this total, 160 individuals were captured in the Cayman Islands and 232 from other locations within the Wider Caribbean and south-eastern USA. There was significant variation in the release-recapture intervals at the three countries with most returns (Cayman, Cuba and Nicaragua). A positive relationship exists between time at large and size at recapture, and data suggest growth rates comparable to those of wild green turtles in the region. There have been at least 6 living tag returns, four released as yearlings and two as hatchlings, demonstrating an age at maturity which may be as short as 15-19 years. These results show that some headstarted turtles are moving around the Caribbean, surviving for long periods of time and contributing to the local breeding population.”

Thus, at least some of the turtles nesting in the Cayman Islands are the result of this headstarting effort. Further monitoring and/or genetic analyses may allow the assessment of the relative importance of this contribution to be assessed.

Internationally

Repatriation: Between 1970-1983, in accordance with the collecting agreements with government authorities of the countries from which eggs were obtained, almost 2,500 turtles of more than 10 months of age were marked using a notching technique and returned to the nesting beaches of origin (Cayman Turtle Farm 2002).

Supporting Research: Since it commenced operation, CTF has been responsible for, or sponsored, a considerable volume of research, both pure and applied, on both green and Kemp’s ridley turtles. This work has resulted in numerous scientific papers many of which are listed in the TCOT bibliography (Appendix 11.1). More recently CTF commissioned a preliminary stochastic simulation model of green turtle dynamics in the West Atlantic, which was discussed and developed during a supporting workshop also funded by CTF: West Atlantic Green Turtle Population Modelling Workshop (22 – 24 October 2003). This workshop included the following international participating specialists: Alberto Abreu, George Balazs, Catherine Bell, Karen Bjørndal, Janice Blumenthal, Alan Bolten, Milani Chaloupka, Gina Ebanks-Petrie, Scott Eckert, Vin Fleming, Jack Frazier, Brendan Godley, Julia Horrocks, Ken Hydes, Cynthia Lagueux, Brian Lusty, Neca Marcovaldi, Anne Meylan, Felix Moncada, Nicholas Mrosovsky, Joe Parsons, Henri Reichart, Sebastian Troëng, Vincent Vera, and Melania Yanez.

Education: The Farm provides one of the few locations in the world where visitors are able to view 4 different species of marine turtles and learn about their conservation. Visitor numbers, the vast majority international, are increasing annually. Guided tours and information boards explain the purpose and operation of the Farm, and highlight the threats marine turtles face. The re-development plans for CTF include enhanced educational facilities.

Kemp’s Ridley Insurance Population: CTF was the location of a highly successful captive breeding program for a small population of Kemp’s ridley turtles until it became apparent that the Rancho Nuevo population showed signs of recovery, and the vast majority of animals were repatriated. A few exhibit animals remain at the CTF.

Partnership in TCOT: The farm has been a partner in TCOT since the current project bid was submitted. The role of CTF was to:

1. Contribute to training as part of the TCOT workshop.
2. Participate in genetics analysis of the CTF herd.
3. Support assessment of the CTF’s activities with free access to all relevant data.

CTF has completely fulfilled its commitments in all these regards.

Supporting International Sea Turtle Conservation Community: CTF has been a donor to three of the organisations central to the co-ordination of marine turtle conservation efforts internationally: International Sea Turtle Society, Marine Turtle Newsletter and SEATURTLE.ORG.

Recommendations

7.1.2.1. Harvest legislation recommendations

While the Cayman Islands have relatively sophisticated regulations to monitor marine turtle harvest, this harvest must be accompanied by meaningful, long-term and systematic monitoring programmes to ascertain trends in turtle abundance. TCOT makes the following recommendations:

- a. Prohibit the capture of all adult marine turtles in Cayman waters. Ensure permanent and complete prohibition of the harvest of reproductively active turtles by extending the closed season to include the 1st of April to the 30th of November inclusive.
- b. Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.
- c. Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length stipulated in any amended legislation.
- d. Ensure prohibition of the harvest of loggerhead and leatherback turtles. The DoE have also expressed that they would recommend prohibition of any future take of hawksbill turtles.

7.1.2.3. Endangered Species Trade and Transport Law

TCOT recommends that the CIDoE be adequately resourced to implement the provisions of the recently enacted Endangered Species Trade and Transport Law, and that the necessary commencement orders be issued by Cabinet as soon as possible. When this legislation comes into effect, it will fully transpose CITES to domestic law.

7.1.4. Maximise the role of the Cayman Turtle Farm in marine turtle conservation

The CTF is ideally and uniquely suited to promoting the conservation of marine turtles in the CI. One key area is in the maximization of the proportion of production that is sold to local people. Since recent production cuts at the CTF, there has been a relative scarcity of turtle meat relative to demand. This has an intrinsic potential to drive the trade in both legal and illegally captured turtle meat from the wild. It is strongly advised that, where possible, production is increased and/or re-routed towards the local market, whether it be through supermarkets or restaurants catering largely to local people, in preference to those most frequented by island visitors. It is recommended that the sale of farmed turtle products be controlled under the Trade and Transport Law to prevent illegal trade in wild turtle products through commercial establishments.

7.8. Indirect Use

7.8.1. Turtle watching on beaches

Although CIDoE occasionally carries out intensive nocturnal monitoring of nesting beaches (e.g. 2002 efforts to confirm the identity of live tagged individuals or 2003 and 2004 efforts to locate study animals as part of a satellite tagging project), nesting numbers are so small as to make the chances of seeing a turtle very low. Nesting turtle numbers would need to increase 5 to 10-fold before any valid turtle watching enterprises could be considered. At this point, given the highly developed tourism in the Islands, any turtle watching enterprise would need to be carefully regulated.

7.8.2. Dive/snorkelling tourism

To put the Cayman dive industry in context, the CI Watersports Association estimate that there are ca. 30 companies, directly employing approximately 500 people in the Cayman Islands, that have diving at the core of their business. In addition, the Land and Sea Co-op offers snorkelling trips to the Cruise Industry and has 25 individual boat owners/companies employing ca. 60 people. It should be noted that these are the direct jobs associated with the industry, and the impact is far more significant once service and support industries are taken into consideration.

Dive tourism undoubtedly plays a huge role in the Caymanian economy. CI Dept Tourism figures show that, in 2000, international tourist arrivals into the Cayman Islands totaled



Photo 7.15. CIDoE logo incorporating Cayman Islands coat of arms (Photo S. Ranger).

1,437,477 (406,620 air arrivals; 1,030,857 cruise ship arrivals) largely from North America and Europe. A more recent survey (June- Nov 2003) has suggested that 54% of cruise ship arrivals (survey sample 132) go snorkeling and 10.6% go diving, whereas of the air arrivals (survey sample 459), 74% go snorkeling and 49% go diving. These very basic figures allow us to estimate that, each year, over 1 million different people snorkel and over 300,000 people dive in the marine environment of the Cayman Islands (source: CI Department of Tourism). These numbers concur with estimates given in Tratalos and Austin (2001). TCOT staff found that there was good take-up of Caribbean Turtlewatch and the four dive operators surveyed in TCOT SEQ identified turtles as 'somewhat important' to their business.

In recent years, a turtle feeding station has evolved at the northern end of Seven Mile Beach. Green turtles have been hand fed from shore at this site for up to 10 years, according to anecdotal reports. They are being fed a wide variety of foodstuffs ranging from cinnamon bagels to mincemeat and squid. Based on size estimates, it is likely that all the turtles seen today are not the same turtles that were being fed ten years ago and that new turtles are recruiting to these 'feeding stations'. Anecdotal evidence also suggests that, after November 2001 and Hurricane Michelle (which was responsible for the loss of turtles at CTF), numbers of green turtles being fed at these locations increased from less than 5 to as many as 10, although the number of turtles appearing on a daily basis fluctuates. Three of these turtles have been tagged by the DoE. One of the most obvious problems being caused by feeding is the alteration of natural behaviour. Recently turtles have been reported to be biting people and becoming aggressive in an attempt to get more food. CIDoE has advised that feeding be discontinued.

7.8.3. Aquaria holding captive turtles

Other than CTF, there are no other public aquaria displaying captive marine turtles, although CIDoE have confiscated and released a small number of green turtles kept in a private aquarium.

7.8.4. Other marketing/cultural uses

The level of use of turtles as insignia and logos in the Cayman Islands is without parallel in the Caribbean Overseas Territories. Sea turtles have a central place in the history, economy and culture of the Cayman Islands and this importance is apparent in the prominence of the sea turtle image in the Coat of Arms (Photo 7.15), National Flag, 10-cent coin, and watermark for all currency notes.

The economic importance of turtles continues to this day, as turtles are used as a marketing tool and attraction throughout the islands. This includes the logos of the National Airline (Sir Turtle), the national power company (Sparky the Turtle; Photo 7.16), and the Cayman Islands Tourism Association, as well as names or logos for dozens of hotels, inns, condominiums, water sports operations, and other businesses, ranging from building supply to travel agencies. A few examples: Turtle Nest Inn, Turtle Beach



Photo 7.16. Sparky the turtle (Photo S. Ranger).

Villas, Turtle Walk, Sea Turtle Villa, Turtle Reef Divers, and Tortuga Rum (a major exporter).

Tourism is a mainstay of the Cayman economy, with SCUBA diving and other water sports providing a primary attraction. Within the tourism industry, images of turtles are common in advertisements, posters, and leaflets promoting diving and snorkelling, submersible and semi-submersible tours, cruises, and other activities. Cayman sea turtles are often featured in Dive, Travel, Airline, and Tourism magazines, and are one of the primary examples of the charismatic megafauna that attract divers, snorkelers, and boaters.

Webpages devoted to the sighting of a sea turtle on a Cayman holiday are common, and websearches for "Cayman Turtle" produce thousands of hits. Jewellery, ornaments, figurines, T-shirts, photos, paintings, and other souvenirs featuring turtles are ubiquitous in local craft-shops and art galleries.

Sea turtle images are utilised by a cross-section of the community, catering to both a local and a tourism market. This prominence illustrates the continuing importance of these species to the culture, economy, and sense of identity of the Cayman Islands.

Of 106 respondents to the TCOT SEQ, 21 suggested that they used turtles indirectly in their business. Fourteen used turtles for advertising, 11 as an attraction and 13 in a professional manner (NB respondents could answer multiple

times). Their sectors included: scuba, tourism, marketing, conservation, hospitality, taxidermy, education, turtle farm, fishing, and retail. Of these, 18 felt they could assess how important this use was to their business: very important (n=3), somewhat important (n=13) and unimportant (n=2). Interestingly, 2 of the 3 businesses that identify their use of turtles (in advertising and as an attraction) as 'very important' also retail turtle meat.

7.9. Attitudes to conservation

TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine turtle management. Respondents could agree, disagree, or have no opinion. In some cases, they could choose 'not applicable'. While full details of responses to these questions have been circulated to local partners, basic results are summarized here. The most common response is cited. In general, most respondents agreed that:

- The government needs to actively work to protect sea turtles (92%)
- Turtles should be protected, regardless of their use to humans (92%)
- It is important that sea turtles exist in the wild in the future (90%)
- Turtles are culturally valuable in this OT (90%)
- Some income from tourism should be used to support sea turtle conservation (87%)
- Turtles play an important ecological role in our natural environment (86%)
- Turtles are an economically valuable resource in CI (84%)
- As turtles are migratory, they should be managed in cooperation with neighbouring states (77%)
- The government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (75%)
- Turtles should be used both as a tourist attraction and as a source of food (54%)
- Local people should be allowed to purchase sea turtle meat (55%)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (53%)
- Turtles should be used as a tourist attraction rather than as a source of food (44%)
- Existing laws protecting marine turtles are effectively enforced (44%)
- Local people should be allowed to catch and eat sea turtles, provided it doesn't threaten the regional population (44%)
- Tourists should be allowed to purchase sea turtle meat (42%)

Approximately equal numbers of people agreed and disagreed that:

- Turtle fishing should be stopped completely (36% yes, 34% no)

A majority of respondents disagreed that:

- Turtle fishing should be unregulated (66%)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (45%)



Photo 7.17. Catherine Bell gives Cayman country report at TCOT workshop (Photo S. Ranger).

These results suggest that there is wide support for the idea of sea turtle conservation in Cayman Islands. There is particularly high support for general 'feel good' statements (e.g. it is important that sea turtles exist in the wild in the future), and wide acceptance of the role of government in turtle conservation. More contentious are statements related to how conservation might be achieved, and specifically the roles of consumption and tourism in conservation programmes. In these instances, opinions are more divided, and the majorities in favour of responses are always slight.

Initial and cursory analysis of responses to these questions by stakeholder group suggests that, while there are some areas of disagreement amongst stakeholders, these are few. For example, turtle fishers as a group generally agree with the responses of the surveyed population as a whole. There are only 4 questions for which the majority of fishers feel differently:

- Turtles should be used as a tourist attraction rather than as a source of food (50% of turtle fishers had no opinion)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (50% of turtle fishers had no opinion)
- Turtle fishing should be stopped completely (50% of turtle fishers disagreed with this statement)
- Tourists should be allowed to purchase sea turtle meat (turtle fishers were divided, with 38% for and against this statement)

The instances in which turtle fishers had no opinion should be treated with caution, as expressing 'no opinion' about an issue that clearly affects the respondent may reflect the respondents discomfort with the question. Due to the non-random sampling employed in this survey, interpreting the results of these opinion questions in particular should be done with caution, as respondents are not representative of the Cayman population. In particular, due to the seemingly high number of young adults surveyed by a friend or family member enrolled in an environmental college course, it is likely that this segment of the population is over-represented, and that older long time consumers are under-represented.

7.10. Capacity Building and Outreach Activities During TCOT

7.10.1. Capacity building

At the start of TCOT, capacity was already high within CDoE, but this has been built upon both as part of the TCOT Training Workshop in Cayman (all staff involved with turtles attended and supported; Photo 7.17), Bermuda Training Course (Catherine Bell 2002; Joni Solomon 2003; Photo 7.18), the ongoing MTRG supervision of Janice Blumenthal and Catherine Bell in graduate studies, and grant raising. This has also included support in the inception of the Cayman Island's Sea Turtle Satellite Tracking Programme.



Photo 7.18. Joni Solomon takes part in Bermuda training course (Photo J. Gray).

Recommendations

7.1.1. Increase capacity for marine turtle management in Cayman Islands

TCOT has significantly contributed to the skills and technical knowledge of the CDoE officers. Although CDoE are relatively well resourced in OT terms, additional resources would further improve the magnitude and quality of the work currently being undertaken. It is essential that the CDoE receives adequate resources to effectively carry out their custodianship of Cayman Islands' highly valuable marine and coastal resources, on which the country's economy so heavily depends.

7.1.1.1. Increase the capacity of the CDoE

It is vital to ensure CDoE has the capacity, staff and resources to carry out research, monitoring and enforcement duties relevant to marine turtle management, including data collection and analysis for turtle monitoring programmes. CDoE staff are well trained and highly motivated, but have a limited research budget which constrains current efforts. It is recommended that national and international funding is sourced to support ongoing research and monitoring efforts as the work being carried out in the Cayman Islands is potentially of profound regional importance and CDoE has capacity to match support.

a) Increased presence in Cayman Brac/Little Cayman. Given the importance of Little Cayman as a foraging and nesting site, and that Cayman Brac has recently been discovered to host nesting and foraging

populations of unknown magnitude, but has long been a centre of turtle exploitation, it is recommended that CDoE have a more significant presence on these sister islands. Although CDoE have one enforcement officer for each of the two Islands, it would seem that, at minimum, a sister islands field base and sufficient operating resources are warranted to facilitate more extensive research, monitoring and community outreach by DoE scientific staff.

7.1.1.2. Establish a multi-stakeholder marine turtle management process

To date there have been 5 years of dedicated marine turtle research on wild marine turtles in the Cayman Islands and marine turtle conservation and management in the Cayman Islands is now of significant public interest. It is essential that public compliance with marine turtle management measures continues and, to facilitate such compliance, it is necessary that stakeholders feel they have meaningful input into the decision-making progress.

It is therefore recommended that the CDoE coordinate a Marine Turtle Working Group to include representatives of relevant stakeholders (e.g. government agencies and departments such as CDoE, Cayman Turtle Farm, Planning and Tourism; NGOs such as CI National Trust; hoteliers; dive operators etc.). The working group should meet regularly to discuss marine turtle management issues and to provide input to government's management and regulatory processes. The group would also function as a public education resource, promoting marine turtle conservation and informing their respective stakeholder groups on marine turtle management issues.

7.1.3.4. Consideration be given to acting as a regional training centre

The combined inwater and nesting monitoring programme of the CDoE would be an excellent training platform for a range of interns, including fisheries officers, from throughout the wider Caribbean region.

7.10.2. Outreach activities

CIDoE have been very proactive in this regard with a range of activities carried out independent of TCOT. These have focussed on the local community, especially school children (Photo 7.19). A central part of these efforts was the satellite tracking of 3 turtles in 2003 and 5 in 2004 (Photo 7.20). Additional support has been given by TCOT staff in the drafting and distribution of press releases resulting in a wide range of media outputs.

Recommendations

7.1.5.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Continue coordinating the established network of hoteliers, beach residents and other beach users to ensure swift reporting of nests so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergences. Key issues to be addressed are lighting, vehicular traffic, and the use of heavy beach cleaning equipment.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure CIDoE has the capacity to collect, necropsy and document all strandings. This network could be supported by a toll-free hotline.
- c) Raise awareness through the continuation and expansion of the campaign to sensitise Caymanians to the importance of protecting the nests of such small nesting populations and to encourage reporting of any illegal take of eggs or nesting females.
- d) Update and expand distribution of guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings.
- e) Ensure continued and enhanced school participation in relevant marine turtle conservation programmes to sensitise children to the importance of rookery protection.

7.1.5.2. Implement general awareness programmes regarding marine turtle conservation in the Cayman Islands

- a) Raise awareness among Caymanians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation, and MEA's.

c) Enhance existing CIDoE programme of awareness raising presentations and workshops in local communities, schools and other public fora.

d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.

e) Develop Cayman Islands specific turtle-related educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.



Photo 7.19. School children partake in fieldwork (Photo CIDoE).



Photo 7.20. Samia the loggerhead heads to sea with satellite transmitter (Photo CIDoE).

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An Assessment of the Status and Exploitation of Marine Turtles in Montserrat





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

8. Status and Exploitation of Marine Turtles in Montserrat

Contents

	Page
8.1. Summary and Recommendations	156-159
8.2. Geographic Overview	160
8.3. Historical Overview	160
8.4. Organisations Involved with Marine Turtles in Montserrat	160
8.5. Status of Nesting Marine Turtles in Montserrat	160-166
8.5.1. Data from nesting beach monitoring	160-164
8.5.2. Data from the TCOT socioeconomic questionnaire	164
8.5.3. Threats to nesting marine turtles	164-165
8.5.4. Genetics of nesting turtles	165
8.5.5. Nesting overview	165-166
8.6. Status of Foraging Marine Turtles in Montserrat	166-170
8.6.1. Information gathered from literature/fishery records	166
8.6.2. Information gathered from Caribbean Turtlewatch	167
8.6.3. Data from in-water monitoring	167
8.6.4. Data derived from the TCOT socioeconomic questionnaire	167-168
8.6.5. Status of marine turtle habitats and in-water threats to marine turtles	168
8.6.6. Genetics	168-169
8.6.7. Summary	169-170
8.7. Direct Use of Marine Turtles in Montserrat	170-173
8.7.1. Overview	170
8.7.2. Harvest of adults on the nesting beach	170
8.7.3. Harvest of eggs	170-171
8.7.4. Harvest of turtles at sea	171-172
8.7.5. Trade in shells and shell products	172
8.7.6. Incidental catch in marine fisheries	172-173
8.7.7. Summary	173-174
8.8. Indirect Use of Marine Turtles in Montserrat	174
8.8.1. Turtle watching on beaches	174
8.8.2. Dive/snorkelling tourism	174
8.8.3. Aquaria holding captive turtles	174
8.8.4. Other marketing uses	174
8.9. Attitudes to Conservation	174-176
8.10. Capacity Building and Outreach Activities During TCOT	176
8.10.1. Capacity building	176
8.10.2. Outreach activities	176-177
8.11. Acknowledgements	178
8.12. References	178-179

8.1. Summary and Recommendations

8.1.1. Summary

Montserrat hosts critically small but regionally important nesting populations of green and hawksbill turtles. (see table 8.1) Occasional nesting activities of loggerhead and leatherback turtles have also been recorded. Although there is a local perception that numbers may be increasing, numbers of nesting turtles in Montserrat are at critically low levels and likely to be remnant of once larger populations. Little is known regarding the status of marine turtles resident in the waters of Montserrat. Green and hawksbill turtles are the most numerous species, but are of unknown magnitude, and smaller numbers of loggerheads are also likely to be present. Based on the data gathered, direct extraction of eggs and adults from the nesting beaches appears to be minimal, and undertaken mostly for personal consumption rather than sale. Levels of extraction at sea are also low, although most former turtle fishers did sell their products, they estimated the value of this to their overall activities as somewhat or not important. Current commerce in marine turtle meat exists, but we only interviewed one current fisher who reported selling it. Turtle meat is the only product consumed and consumers have noticed a decrease in availability over time.

Summary of Recommendations

TCOT recommends that the Government of Montserrat takes all necessary steps to ensure the sustained existence of nesting and foraging populations of marine turtles in Montserrat and to facilitate their recovery.

This will require actions under the following general headings:

8.1.1. Increase capacity for marine turtle management

8.1.1.1. Increase the capacity of the Government of Montserrat.

8.1.1.2. Increase the capacity of the Montserrat National Trust.

8.1.1.3. Establish a multi-stakeholder biodiversity management process.

8.1.2. Amend legislation and policy to facilitate marine turtle population recovery

8.1.2.1. Revise Turtle Ordinance Cap 112 1951.

8.1.2.2. Establish Marine Protected Areas.

8.1.2.3. Consider Marine Turtles as part of Planning Policy and Beach Management.

8.1.2.4. MEA legislation recommendations.

8.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

8.1.3.1. Establish systematic monitoring efforts at index nesting beaches.

8.1.3.2. Establish a systematic in-water monitoring programme.

8.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting Montserrat to marine turtle conservation requirements

8.1.4.1. Encourage and implement sensitive practices at existing nesting beaches.

8.1.4.2. Implement general awareness programmes regarding marine turtle conservation in Montserrat.

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	Small numbers	Juveniles present In very small numbers	Still present at reduced levels targeting large juveniles and adults. Legal and possibly illegal Low levels of egg take-illegal and possibly legal
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Small numbers	Juveniles and possibly some adults present in small numbers	Still present at reduced levels targeting large juveniles and adults Low levels of egg take
Leatherback Turtle (<i>Dermochelys coriacea</i>)	Occasional nest	Rarely encountered	Unlikely
Loggerhead Turtle (<i>Caretta caretta</i>)	Small numbers	Rarely encountered	Unlikely

Table 8.1. Marine turtle species present and summary of exploitation in Montserrat.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific Recommendations

8.1.1. Increase capacity for marine turtle management in Montserrat

TCOT has contributed to the skills and technical knowledge of the Government of Montserrat Fisheries Department and contributed to Montserrat National Trust events. However, the enforcement patrol, research and monitoring capacity of the Government of Montserrat (GoM) is currently compromised due to an extreme shortage of staff, equipment and a very limited budget. It is essential that GoM apports adequate resources to effectively carry out their custodianship of Montserrat's highly valuable marine and coastal resources on which the country's future so heavily depends. In addition, Montserrat National Trust would be the ideal organisation to deal with awareness raising programmes and support marine turtle research, but at present is also significantly below capacity for this role, with no current project officer for biodiversity conservation.

8.1.1.1. Increase the capacity of the Government of Montserrat

- a) Ensure GoM has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes.
- b) Ensure that key staff in GoM have the skills to apply for external funding to support biodiversity related projects.
- c) Ensure that all new Fisheries Officers are adequately trained in marine turtle biology, as well as research and conservation techniques.

- d) Ensure that adequate expertise is in place to allow for the process of legislative review.

8.1.1.2. Increase the capacity of the Montserrat National Trust

As part of a general increase in staffing and resources of the Montserrat National Trust, one of the urgent needs is for a project officer who can lead outreach campaigns, and support/ liaise with the many international organisations currently involved in biodiversity work in Montserrat. This officer's duties should include coordinating these various efforts, whether they involve provision of funds, staff, equipment, training or advice.

8.1.1.3. Establish a multi-stakeholder biodiversity management process

Identify and establish a Biodiversity Working Group to include representatives of all interest groups and stakeholders (e.g. government agencies and departments including Planning and Tourism; NGO's; hoteliers; dive operators; construction industry representatives, fishers, schools and specially-interested members of the public). The working group should meet regularly to discuss, decide and advise government on biodiversity management issues working to implement Montserrat's Environment Charter, marine turtles being one key subject area. With regard to marine turtles, particular attention should be paid to direct and indirect fishery interactions, habitat protection, exploring possibilities for sourcing funding, further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation, and external advice should be sought from appropriate experts. There may be a need to provide support for participation by some sectors (i.e. cover travel costs to meetings). In other OTs, it has been recommended that a specific group be assembled for marine turtles, but it is felt that at this stage a single focus group is more likely to succeed and make significant inroads, given limited resources on Montserrat.

8.1.2. Amend legislation and policy to facilitate marine turtle population recovery

The current legislation that regulates the harvest of marine turtles and their eggs in Montserrat does not facilitate the sustainable management of the country's nesting and foraging populations of marine turtles.

TCOT recognises that cessation of all turtle fishing would significantly contribute to the recovery of depleted turtle populations. TCOT also recognises that turtle meat is a component of the traditional Montserratian diet and a moratorium is unlikely to receive enough support from the fishing community, especially given the current economic situation in Montserrat. However, we make a suite of recommendations to allow future harvest of turtles to be carried out in a highly regulated and controlled manner, minimising its impact on the local nesting populations. We suggest programmes to monitor stock abundance and mechanisms to reduce or close the fishery in response to measured future decreases in turtle stock. The fishing community should be involved in this process, and their

interest in doing so was expressed as part of the TCOT SEQ results (see section 8.9). Furthermore, given that GoM will be responsible for the management of a future turtle fishery, it is vital that they have the skills, as well as the human, technical and financial resources to effectively monitor the fishery.

Regulation of use alone will not serve the sustainable management of these turtle populations. TCOT therefore also makes recommendations to facilitate protection of critical marine turtle habitat in Montserrat.

8.1.2.1. Revise Turtle Ordinance Cap 112 1951

We recommend the following based on the draft revisions drawn up by the GoM as “the Turtle Act 2002” (not yet gazetted). It should be noted however, that additional amendments to the “Turtle Act 2002” are needed:

- i) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.
- ii) Ensure a closed season from the 1st of March to the 30th of November inclusive, to be reviewed every five years (to facilitate legislative adaptation to possible nesting season shift caused by climate change).
- iii) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum would be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.
- iv) Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg), with an equivalent minimum curved carapace length that should be stipulated in any amended legislation.
- v) Establish a limited turtle fishing licensing scheme, whereby especially licensed turtle fishers agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including compulsory reporting to, and catch biometric measurement/sampling by, the Government of Montserrat of all turtles caught, in advance of slaughter. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes.
- vi) Ensure permanent and complete prohibition of all turtle capture methods except hand capture and use of turtle nets, with strict specifications for legal net structure and use.
- vii) Ensure prohibition of the harvest of loggerhead and leatherback turtles.

NB. Any continuing turtle fishery must be accompanied with systematic monitoring regimes as described below, along with a programme to monitor Catch per Unit Effort of licensed fishers,

and biometrics of turtle catch, which should also be implemented by the GoM. Fisheries regulations should be revised to provide statutory powers to react to the ongoing results of the abundance trend monitoring programmes. In the event of declining abundance trends or declining Catch per Unit Effort below pre-established thresholds, the GoM must have the power to temporarily or permanently close the turtle fishery.

8.1.2.2. Establish Marine Protected Areas

Montserrat does not currently have any marine protected areas. It is advised that, based on holistic assessment of the marine biodiversity of Montserrat, key areas be set aside for protection.

8.1.2.3. Consider Marine Turtles as part of Planning Policy and Beach Management

Montserrat's nesting marine turtles probably represent remnants of depleted populations and are at critically low levels (see section 8.5). However, the adverse impacts of increased beachfront development on the nesting populations using Montserrat's mainland beaches must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Montserrat, and therefore TCOT recommends the following policies:

- a) Ensure all development, other than non-permanent structures designed for daytime beach use, is 100m landward of the high tide mark.
- b) Introduce planning regulations to mitigate the adverse impacts of development on marine turtles, including, for example light pollution, nesting female disturbance and erosion.
- c) Ensure marine turtles are considered in the current beach sediment extraction projects being carried out in support of Montserrat's reconstruction. Extraction from major nesting beaches should be permanently discontinued.

8.1.2.4. MEA legislation recommendations

The Endangered Animals and Plants Ordinance, 1976, should be amended to prohibit commercial import and export of turtles and all turtle products of all wild marine turtle species, so that this legislation fully transposes CITES to domestic law.

8.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

Montserrat hosts nesting populations of green and hawksbill turtles, and occasional nesting by loggerhead and leatherback turtles is likely. In addition, coastal waters host foraging populations of green and hawksbill turtles of unknown magnitude, with occasional loggerhead turtles also reported. Montserrat's nesting turtle populations are probably remnant and at critically low levels (see section 8.6). Trends in abundance will only be determined by long-term systematic monitoring. In order to understand the conservation status of these populations and inform effective conservation management, it is vital to work towards establishing data that will reveal any trends in their

abundance. TCOT therefore recommends that the following monitoring programmes be established, under the guidance of the proposed Biodiversity Working Group, as a matter of priority:

8.1.3.1. Establish systematic monitoring efforts at index nesting beaches

Establish a sustained programme of morning nesting beach monitoring at index beaches to determine nesting abundance trends and to facilitate genetic analysis of nesting populations, through nest excavation and sampling. Ideally, monitored beaches should be visited at minimum three times per week to ensure species identification, and surveying should be carried out across the duration of the known nesting season and with constant effort.

NB. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the proposed Biodiversity Working Group, into seasonal, revenue-generating tourist turtle walks in order to raise funds to sustain marine turtle management efforts.

8.1.3.2. Establish a systematic in-water monitoring programme.

In the first instance this would assess species composition and distribution, highlighting key areas of abundance. Building upon this, effort related surveying should be carried out to allow trends in abundance to be assessed, and sampling for genetic profiling should be undertaken.

NB. Under the guidance of the proposed Biodiversity Working Group, steps should be taken to encourage the involvement of interested local fishers in all monitoring programmes (e.g. CPUE monitoring), and financial incentives should be considered so long as they fit within the remit of a sustainable programme.

8.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting Montserrat to marine turtle conservation requirements

Increased awareness of turtles and their conservation requirements in Montserrat can provide short- and long-term mitigation against the threats faced by marine turtles due to development. TCOT recommends the following actions, to be implemented under the guidance of the Biodiversity Working Group, to facilitate public contribution to marine turtle conservation:

8.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, residents and other beach users to ensure reporting of nests not on index beaches, so that they can be marked, protected and monitored.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure GoM has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to sensitise Montserratians to the importance of protecting the nests of such small nesting populations and to

encourage reporting of any illegal take of eggs or of nesting females.

- d) Ensure school participation in any rookery monitoring programmes to sensitise children to the importance of rookery protection.

8.1.4.2. Implement general awareness programmes regarding marine turtle conservation in Montserrat

- a) Raise awareness among Montserratians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.
- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop Montserrat specific turtle educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.



Photo 8.1. John Jeffers with a green turtle hatchling (Photo B. Godley).

8.2. Geographic Overview

Montserrat (16°45'N, 62° 12' W) is a small volcanic island situated in the Leeward Antilles (See Fig 8.1). Montserrat has suffered a series of natural disasters in recent years, including hurricanes and volcanic eruptions. Although reducing at the time of writing, some areas of the island have at times been no-go areas as a result of the eruptions. It has a total land area is 104 km² with a coastline of 40km. The population is much reduced following an estimated 8,000 refugees leaving the island following the volcanic activity in 1995 and 1996/1997. Some have returned. The population prior to 1995 was estimated at 12,000. Montserrat has a GDP per capita of US\$3,400 (2002 est.), the lowest of all the OTs. Natural disasters of recent years have affected the island economy based upon tourism, rum production, textiles and electronics. Prior to the eruption, 30,000 tourists visited Montserrat annually accounting for 25% of the GNP. In the year 2000, only 15,000 visited.

8.3. Historical Overview

Montserrat was subject to human habitation from pre-historic times and colonised by Europeans in the early 17th century. Steadman *et al.* (1984) have unearthed evidence of hawksbill turtle (presumed adult) exploitation by the Saladoid culture, a people who colonized the Lesser Antilles *ca.* 2000 years ago. Other than this reference, we have not uncovered any information regarding turtle exploitation before the 1940s. However, it is likely that it has been ongoing since settlement.

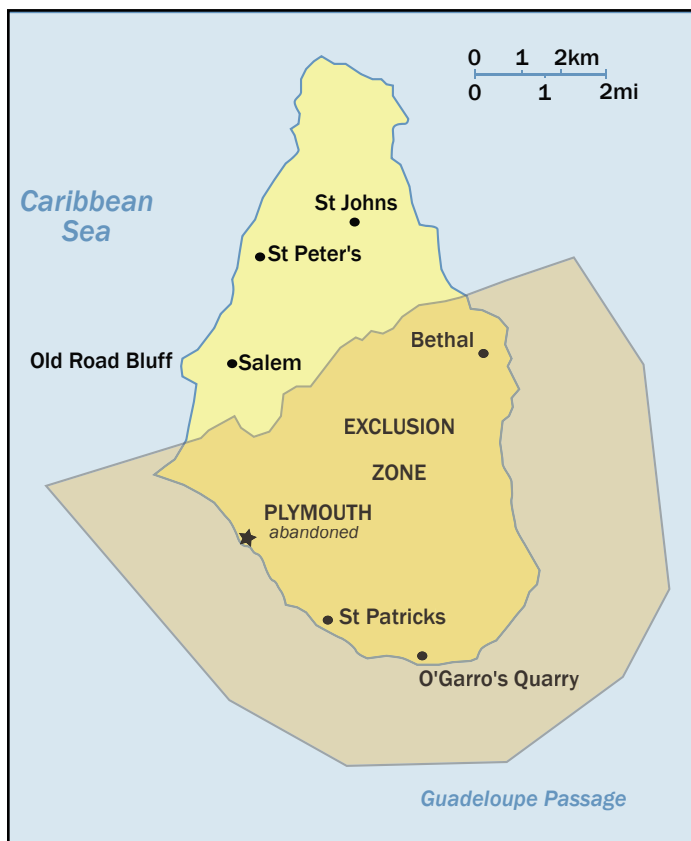


Figure 8.1. The island of Montserrat.



Photo 8.2. Fox's Bay, Montserrat (Photo B. Godley).



Photo 8.3. Rendezvous Bay, Montserrat (Photo B. Godley).

8.4. Organisations Involved with Marine Turtle Monitoring and Conservation in Montserrat

The Department of Fisheries has a staff of 4, has access to government pool road vehicles, but no marine vessel. A Police launch is used occasionally for surveillance. The department is responsible for all aspects of marine fisheries, including marine turtles, and the Fisheries Assistant, Mr. John Jeffers (J.J.), has assumed the mantle for marine turtle monitoring for a number of years (Photo 8.1).

The Montserrat National Trust employs a staff of 5; including a Director, a museum curator, a secretary and 2 botanical gardens assistant. Marine turtles have featured in awareness raising materials, but there are no staff actively involved with marine turtle fieldwork.

8.5. Status of Nesting Marine Turtles in Montserrat

8.5.1. Data from nesting beach monitoring

Four species of sea turtles have been reported nesting in Montserrat. Seminal studies suggested that green and hawksbill turtles nested in small numbers, whilst loggerhead and leatherback turtle nests were only occasionally encountered (Groombridge & Luxmoore 1989; John 1984;

Meylan 1983). Meylan (1983) reported that nesting levels were low, presumably because of constant human activity on the island's beaches (that were widely used for boat storage and recreational purposes). Whether nesting levels were reduced at this time is a matter from conjecture, but given direct exploitation has occurred for some 2000 years, it is likely that numbers were reduced by the 1980's.

The island is of volcanic origin, and all but one of its sandy beaches consists of black volcanic sand (Photo 8.2); white calcareous sand dominates at Rendezvous Beach (Photo 8.3) near the northern tip of the island (Anonymous 1993). Apart from Trant's and Farm beaches (east coast), all of Montserrat's sandy beaches are located on the western side of the island (Figure 8.1.). Since the recent volcanic activity, a great deal of sediment run-off means that some beaches are growing (e.g. Isles Bay) and much of the south coast has become a sandy coastline.

Although marine turtle monitoring had been ongoing since studies in the 1980s (John 1984; Meylan 1983), almost all relevant data were lost along with many government records in the volcanic activity that engulfed Plymouth in 1997.

Daytime monitoring of marine turtle nesting

The Fisheries Department of Montserrat's Agriculture Ministry has been coordinating monitoring of the island's beaches for turtle activities since 1999. Although, ad-hoc, day-time beach monitoring has been carried out by dedicated island residents, with these individuals regularly checking their local beach for turtle emergences and nests, the bulk of the monitoring effort has been carried out by the Fisheries Department (J.J.). Monitoring frequency of nesting beaches has been uneven and especially patchy on the beaches located in the exclusion zone (Figure 8.1.). Safe, accessible beaches were walked and checked for turtle tracks and nests. Sites subject to volcanic risk were checked from an offshore boat with binoculars. Beach monitoring sheets were filled by staff (J.J.) each time a beach was visited, and by other island residents only when they had detected nesting activities on their local beach. Nests (N), i.e. adult emergences resulting in clutch deposition, were individually



Photo 8.4. Track of hawksbill turtle (Photo C. Martin).

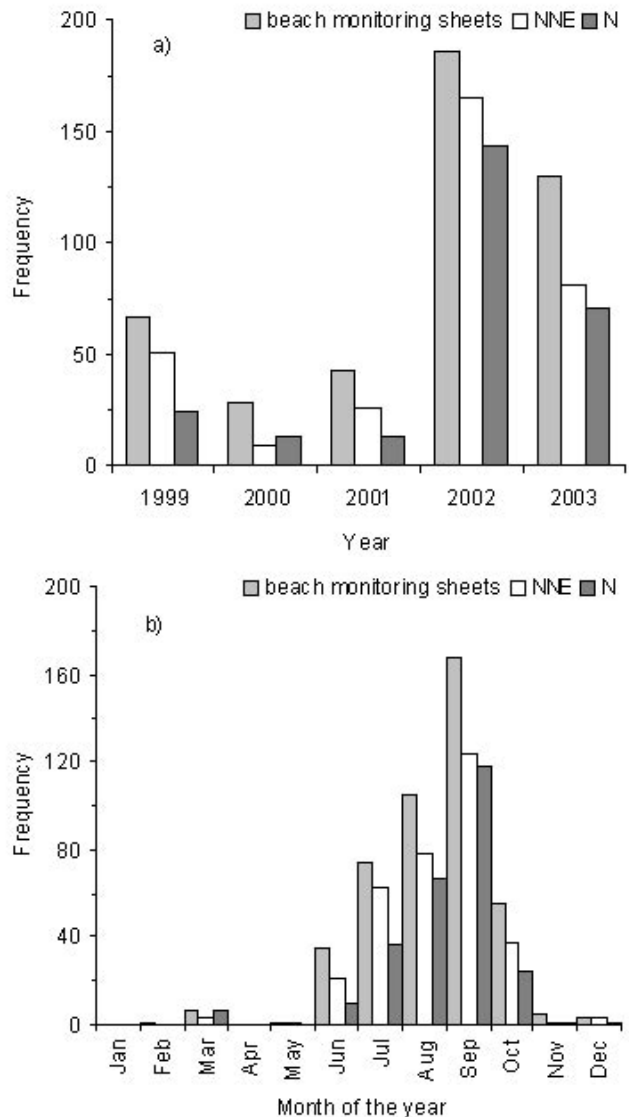


Figure 8.2. a) The total numbers of completed beach monitoring sheets, records of non-nesting emergence (NNE) and nests (N), for the period 1999 to 2003. **b)** The total numbers of completed beach monitoring sheets, records of non-nesting emergences (NNE) and nests (N), by calendar month (1999 to 2003).

counted. Non-nesting emergences (NNE) were not counted individually, but instead their presence or absence on any given survey day was recorded. No distinction was made among species based on track morphology.

In 2003, all beaches were monitored a minimum of once per week for one month (mid-August/mid-September). Beaches were either walked or checked from a distance with binoculars (e.g. from a helicopter or boat). Special permission was granted from the authorities to access and walk some of the beaches of the exclusion zone (Trant's, Farm, Fox's, Bransby Point, Hot Water Pond). In these surveys, individual non-nesting emergences and nests were counted and species identification from tracks morphology was undertaken where possible (following Pritchard & Mortimer 1999; Photo 8.4).

Data originating from a total of 453 beach monitoring forms were analysed (Table 8.2). The mean annual total of nests

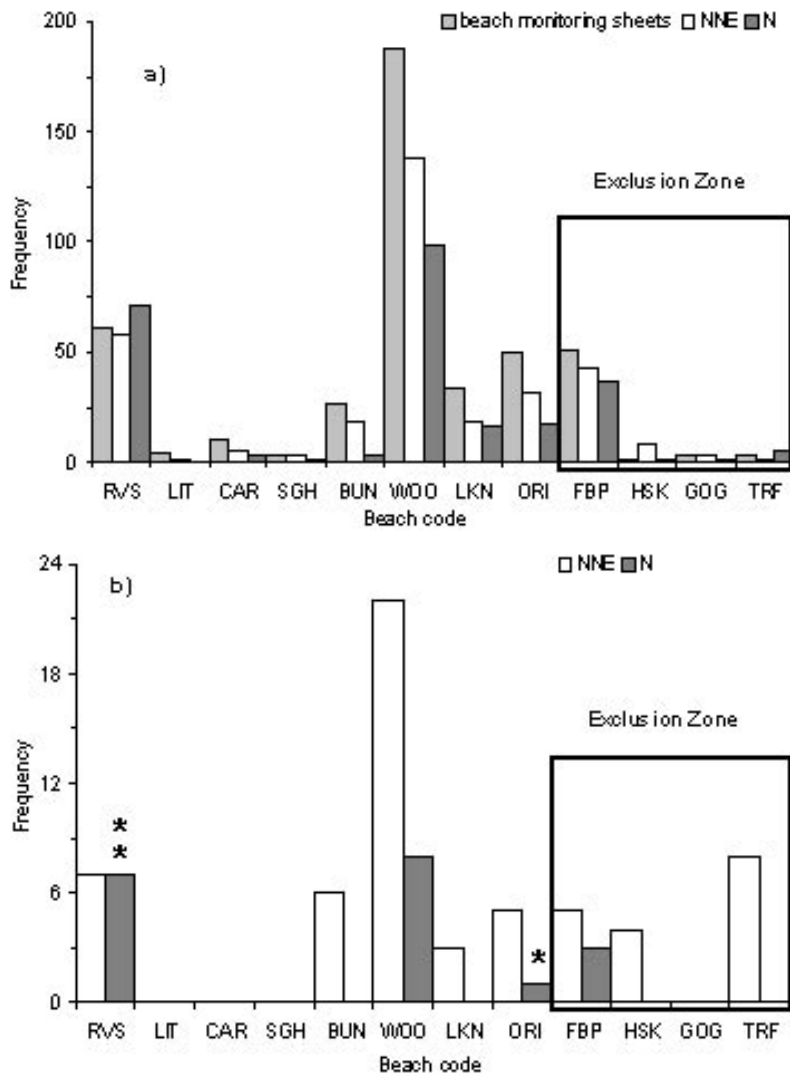


Figure 8.3. a) The numbers of completed beach monitoring sheets, records of non-nesting emergences (NNE) and nests (N), per beach (1999 to 2003). For beach codes see Table 8.2. **b)** Individual non-nesting emergences (NNE) and nests (N), per beach (mid-August/mid-September 2003) (* and ** indicate one and two hawksbill turtle nests, respectively).

recorded for the period 1999 to 2003 was 53 (± 24.9 SD, range: 13–143). Annual numbers of non-nesting emergences and nests are highly correlated with associated monitoring frequency when one considers annual totals (Figure 8.2.a) or the combined monthly totals of nesting activity (Figure 8.2.b). During the monitoring period, Woodlands beach demonstrated the greatest nesting intensity of all beaches, but was also the most monitored beach of the island (Figure 8.3.a). The three other key nesting beaches appeared to be Rendezvous, Fox's Beach/Bransby Point and Old Road/Iles Bay beaches (Figure 8.3.a). Nesting activities followed a strong seasonal pattern, with 97% of turtle activities (non-nesting emergences and nests) being recorded between June and October, clearly peaking in September (Figure 8.2.b). The seasonality of nesting activities closely followed the pattern of the monitoring intensity.

For mid-August/mid-September 2003, there were a total of 60 nesting emergences and 19 nests recorded (Table

8.3). There were 21 non-nesting emergences and six nests of green turtles, and 17 non-nesting emergences and three nests of hawksbill turtles. Because of their relatively large widths, four asymmetrical tracks observed on Trant's beach were attributed to loggerhead turtle(s), despite no nest being observed. The spatial distributions of non-nesting emergences and nests for mid-August/mid-September 2003 (Figure 8.3.b) showed patterns similar to those shown when all data are pooled from the five year long dataset (Figure 8.3.a). Moreover, the numbers of non-nesting emergences for mid-August/mid-September 2003 were highly correlated with the total numbers of recorded non-nesting emergences for the period 1999 to 2002 (Spearman's rank correlation $R_s = 0.84$, $P < 0.01$). Such a relationship was also detected between the numbers of nests for mid-August/mid-September 2003 and the total number of nests for the period 1999 to 2002 ($R_s = 0.57$, $P < 0.05$).

Night-time beach monitoring

In 2002 and 2003, logistics permitting, beaches were monitored at night for the presence of nesting adult turtles. When possible, nesting turtles were measured (Curved Carapace Length, CCL) and tagged with Passive Integrated Transponders (PIT's). In 2002 and 2003, a total of 28 individual nesting turtles were measured: 16 green turtles (12 in 2002 and 4 in 2003; mean CCL (cm) = 106.9 ± 6.3 SD, range: 103–118) and 11 hawksbill turtles (9 in 2002 and 2 in 2003; mean CCL (cm) = 87.8 ± 6.8 SD, range: 79–103). A total of 9 hawksbill (8 in 2002, 1 in 2003) and 13 green turtles (11 in 2002, 2 in 2003) were PIT tagged. All were tagged on Woodlands beach, with the exception of 3 hawksbill turtles that were tagged on Carr's beach (2 in 2002, 1 in 2003). In 2002, 2 green turtles (Photo 8.5) were re-sighted on Woodlands beach after having been PIT tagged on that beach earlier in the season, 11 and 12 days earlier respectively. These data were supplemented by 1 sighting (by a member of the public) of a loggerhead turtle nesting on Woodlands beach in August 2002, and hatchling leatherback turtles being discovered on the same beach in the mid 1990's (Jeffers unpublished data). In addition, since the advent of TCOT, project efforts are made to record the hatching of nests and undertake excavation to monitor hatching success and gather genetics vouchers.

Status of nesting populations

When monitoring efforts are intermittent and uneven we should show caution before making any wide ranging recommendation regarding status. There are, however, a few key points that can be elaborated from the existing data. Green and hawksbill turtles nest in modest yet regionally important numbers in Montserrat, probably every season. Leatherback and loggerhead turtles also appear to nest, but these events are undoubtedly relatively rare. This is in concord with the wider literature that suggests that green and hawksbill turtles are the most common species of

	1999		2000		2001		2002		2003	
	NNE	N	NNE	N	NNE	N	NNE	N	NNE	N
RVS	7	6	1	3	4	3	23	25	22	34
LIT	0	0	0	0	0	0	0	0	1	0
CAR	1	0	0	0	0	0	2	3	2	0
SGH	1	1	0	0	1	0	1	0	0	0
BUN	2	0	0	0	0	0	11	2	5	0
WOO	4	4	1	0	4	4	93	70	36	21
LKN	0	0	0	0	1	0	10	16	7	0
ORI	9	4	1	4	9	3	11	7	2	0
FBP	20	5	4	5	7	3	10	15	5	10
HSK	3	4	2	1	0	0	4	5	0	0
GOG	3	0	0	0	0	0	0	0	0	0
TRF	0	0	0	0	0	0	0	0	1	5
Total	50	24	9	13	26	13	165	143	81	70

Table 8.2. Breakdown of the number of events when non-nesting emergences (NNE) were recorded and the numbers of nests (N), per beach and year. Beach codes: RVS: Rendez-vous, LIT: Little Bay, CAR: Carr's Bay, SGH: Soldier Ghaut, BUN: Bunkum Bay, WOO: Woodlands Beach, LKN: Lime Kiln Bay, ORI: Old Road/Iles Bay, FBP: Fox's Bay/Bransby Point, HSK: Hot Water Pond/Sugar/Kinsale, GOG: German's/O'Garro's, TRF: Trant's/Farm Bay).

	Green		Hawksbill		Loggerhead		Undetermined	
	NNE	N	NNE	N	NNE	N	NNE	N
RVS	0	1	0	2	0	0	7	4
LIT	0	0	0	0	0	0	0	0
CAR	0	0	0	0	0	0	0	0
SGH	0	0	0	0	0	0	0	0
BUN	1	0	3	0	0	0	2	0
WOO	14	4	5	0	0	0	3	4
LKN	0	0	3	0	0	0	0	0
ORI	0	0	4	1	0	0	1	0
FBP	2	1	0	0	0	0	3	2
HSK	2	0	2	0	0	0	0	0
GOG	0	0	0	0	0	0	0	0
TRF	2	0	0	0	4	0	2	0
Total	21	6	17	3	4	0	18	10

Table 8.3. Breakdown of the number of non-nesting emergences (NNE), and nests (N), per beach and species, for the period mid-August to mid-September (2003). For beach codes see Table 8.2.

nesting sea turtles in the Lesser Antilles, whilst leatherback and loggerhead turtles tend to nest in comparatively lower numbers (e.g. d'Auvergne & Eckert 1993; Chevalier & Lartiges 2001; Eckert & Honebrink 1992; Eckert *et al.* 1992; Fuller *et al.* 1992; Meylan 1983; Scott & Horrocks 1993; Sybesma 1992).

Magnitude of nesting data recorded was closely correlated with survey frequency in time and space. It is likely that recorders more frequently carried out surveys at times and locations when the probability of recording turtle nesting activity was higher. Although this may have resulted in some spatial and temporal biases in the data set, the seasonality of the Montserrat nesting season as described by the data set is plausible, running primarily from June to October. Although due to the nature of the data it was not possible to discriminate between the seasonality of the different

species, the temporal distribution of the data are consistent with seasonality of nesting reported for green turtles (Fuller *et al.* 1992; Hirth 1997) and hawksbill turtles (Corliss *et al.* 1989; Eckert & Honebrink 1992; Scott & Horrocks 1993) in the region. Additionally, the data collected during the period of intensive monitoring in 2003 generated a spatial distribution of nesting broadly similar with that of previously collated data.

The key nesting beaches for green and hawksbill turtles in Montserrat appeared to be Woodlands (so far unreported in the literature), Rendezvous, Fox's/Bransby Point and Old Road/Iles Beaches. Even though green turtles left tracks on many of the island's beaches, actual nesting by this species was only confirmed for Rendezvous, Woodlands and Fox's/Bransby Point beaches. Meylan (1983) reported that green turtles might also be nesting at Little and Iles beaches.



Photo 8.5. Dyonne Dewberry filming return to sea of a green turtle (Photo C. Martin).

Actual nesting by hawksbill turtles was solely confirmed for Rendezvous and Old Road/Iles Beaches, although Meylan (1983) also quotes Carr's, Little and Soldier Ghaut beaches as nesting sites for this species. On Trant's beach, tracks possibly belonging to loggerhead turtles were reported, in agreement with the belief that loggerhead turtles occasionally nest on the island (John 1984).

8.5.2. Data from the TCOT SEQ

All survey respondents were asked about perceived changes in abundance of nesting marine turtles by species, in the last 5 years and since they could remember (Q105a-c). Views of former and current egg collectors are considered separately, and views of all respondents are summarized in Table 8.4. Of the 6 former and 1 current egg collectors interviewed as part of the TCOT SEQ, only 1 respondent

believed there has been a change in abundance of nesting turtles (1 felt there was no change, 4 didn't know, and 1 did not respond). He felt that turtles in the OT have increased both in the short and long term for green, loggerhead, leatherbacks and hawksbill. He also cited the increases in both time periods for turtles in general.

Only 15 of the 71 respondents to TCOT SEQ noticed a change in abundance of nesting turtles (9 noticed no change, 44 didn't know, and 3 didn't answer the question). As Table 8.4 shows, few respondents commented on individual species. Most respondents believed that nesting numbers for turtles had increased over both time periods, and most of the few who comment on individual species also believed there have been increases for all species in both time frames.

Respondents were asked about reasons for the perceived increase or decrease, both in the number of turtles nesting and found in OT waters (reasons were not distinguished by habitat). Responses (offered by 29 respondents) varied, with no single explanation dominating. Reasons cited for increases included: fewer people fishing, increased monitoring, no longer catching during breeding season, fewer people on island, and education. Reasons for perceived decreases included: changing habitat due to volcanic activity, and over-harvest.

8.5.3. Threats to nesting marine turtles

Montserrat presents a relatively narrow coastal shelf, dropping off rapidly to nearly 200 m only 650 m from the shoreline along the southern half of the island, whilst in the north, northeast and west, the shelf slopes more gently (the 200 m contour is approximately 5 km offshore; Gell & Watson 2000). The result is a high energy, erosion prone coastline, with mostly intermittent beaches (Anon 1993).

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	3	1	0	0	11
Leatherback	2	0	0	0	13
Loggerhead	2	0	0	0	13
Hawksbill	3	1	0	0	11
General	8	3	0	1	3

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	3	3	0	0	11
Leatherback	2	0	0	0	13
Loggerhead	2	0	0	0	13
Hawksbill	3	1	0	0	11
General	8	3	0	1	3

Table 8.4. Perceptions of change in abundance of sea turtles nesting (by species and in general), in the last five years and since you can remember (n=15 respondents who perceive change)



Photo 8.6. Ash crust on Fox's Bay (Photo C. Martin).

The quality of Montserrat's beaches with regards to sea turtle nesting appears to be naturally poor. As a result, beach erosion may periodically prevent gravid turtles from nesting, as well as destroy incubating nests

Additional factors of concern to marine turtles linked to the volcanic eruptions include ash deposits and beach mining. Occasional ash deposits cover nesting beaches (Photos 8.6 and 8.7), render them less suitable or wholly unsuitable for nesting until they are manually cleared or cleared by heavy storms. For Montserrat's rebuilding, extraction of beach sediment deposits, largely of volcanic origin has been undertaken at Trant's (Photo 8.8) and Isle's Bay (Photo 8.9), but has now been discontinued at the latter site (C. Gerald (GoM) pers. comm. 2004). It is important that the integrity of these two beaches is maintained and that ongoing turtle monitoring, preferably daily, of these sites ensures that any clutches deposited in "at risk" locations are moved to safety.

Nest predation by feral pigs and dogs is also of concern, but has not yet been documented in detail (J. Jeffers (Montserrat Dept. Fisheries) pers. comm. 2004). It is felt that predation by feral pigs has lowered the suitability of Fox's Bay as a nesting habitat in 2004 and the Department of Agriculture has taken steps to control feral pigs there (C. Gerald (GoM) pers. comm. 2004).

8.5.4. Genetics of nesting turtles

TCOT genetic analyses have shown that the haplotypes of nesting samples collected in the Montserrat have also been described in a number of other nesting sites and foraging areas (see section 10.4.4):

For wild green turtles, haplotypes described in **nesting** turtles/hatchlings from the Montserrat have not yet been described. All three degraded samples failed.

For hawksbill turtles haplotypes described in **nesting** turtles/hatchlings from Montserrat have been described from **foraging** grounds in Anguilla, BVI, Cayman Islands, Cuba, Puerto Rico, TCI. These haplotypes have also been described from **nesting** aggregations in Antigua, Barbados, Brazil, Cuba, Puerto Rico, TCI, USVI.

For loggerhead turtles no genetics vouchers were collected.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004 and more definitive answers will be available at that point. Data will be disseminated as part of the recently funded cross territory Overseas Territories Environment Programme (OTEP) project that will focus on Marine Turtle Conservation, the Environment Charter and Multilateral Environment Agreements.

8.5.5. Nesting overview

Montserrat hosts nesting populations of green and hawksbill turtles with occasional nesting by loggerhead and leatherback turtles likely. Although, according to local perceptions, numbers may be increasing, Montserrat's nesting turtle numbers are at critically low levels and likely to be remnant of once larger populations.



Photo 8.7. Turtle tracks on ash crust (Photo C. Martin).



Photo 8.8. Sand extraction at Trant's Bay (Photo C. Martin).

Recommendations

8.1.2.3. Consider Marine Turtles as part of Planning Policy and Beach Management

Montserrat's nesting marine turtles probably represent remnants of depleted populations and are at critically low levels (see section 8.5). However, the adverse impacts of increased beachfront development on the nesting populations using Montserrat's mainland beaches must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Montserrat, and therefore TCOT recommends the following policies:

- a) Ensure all development, other than non-permanent structures designed for daytime beach use, is 100m landward of the high tide mark.
- b) Introduce planning regulations to mitigate the adverse impacts of development on marine turtles, including, for example light pollution, nesting female disturbance and erosion.
- c) Ensure marine turtles are considered in the current beach sediment extraction projects being carried out in support of Montserrat's reconstruction. Extraction from major nesting beaches should be permanently discontinued.

8.1.3.1. Establish systematic monitoring efforts at index nesting beaches

Establish a sustained programme of morning nesting beach monitoring at index beaches to determine nesting abundance trends and to facilitate genetic analysis of nesting population, through nest excavation and sampling. Ideally, monitored beaches should be visited at minimum 3 times per week to ensure species identification, and surveying should be carried out across the duration of the known nesting season and with constant effort.

NB. This programme should preferably engage local interest groups and residents and could eventually be developed, under the guidance of the proposed Biodiversity Working Group, into seasonal, revenue-generating tourist turtle walks in order to raise funds to sustain marine turtle management efforts.

8.1.4.2. Implement general awareness programmes regarding marine turtle conservation in Montserrat

- a) Raise awareness among Montserratians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEAs.

- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop the Montserrat specific turtle educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.



Photo 8.9. Isle's Bay with disruption from extraction (Photo B. Godley).

8.6. Status of Foraging Marine Turtles in Montserrat

8.6.1. Information gathered from literature/fishery records

Adult and juvenile hawksbill and green turtles are found in Montserrat's inshore waters (John 1984; Meylan 1983). Local fishers are encouraged to report any sea turtle (along with their fish catches) to the fisheries authorities (see section 8.6.6 below). In addition, some former turtle fishers now collaborate with authorities on research initiatives (Photo 8.10). The harvest information suggests that a wide size range of green and hawksbill turtles are present year round in Montserrat's waters. Although no loggerhead turtles were officially recorded as captured, TCOT staff did see one relatively fresh carapace, which had been removed from a loggerhead turtle stranded dead in 2000. All other prepared carapaces encountered by TCOT staff were of green and hawksbill turtles. These are the most common species of sea turtles found in the waters elsewhere in the Lesser Antilles, with leatherback and loggerhead turtles tending to be present in comparatively lower numbers (e.g. d'Auvergne & Eckert 1993; Carr *et al.* 1982; Chevalier & Lartiges 2001; Eckert & Honebrink 1992; Eckert *et al.* 1992; Fuller *et al.* 1992; Meylan 1983; Scott & Horrocks 1993; Sybesma 1992).

Species	<25cm	26-50cm	51-75cm	>76	Unknown size	Total	Site
Green	0	0	0	0	1	1	1
Hawksbill	1	4	1	0	0	6	2, 3, 4, 5
Loggerhead	0	0	1	0	1	2	6, 7
Leatherback	0	0	0	0	0	0	
Unidentified	0	7	0	0	1	8	6, 2, 5

Table 8.5. Summary of species and size class of individual turtles observed by divers in Montserrat Jan-Sept 2003. Key to locations: 1Virgin Island, 2Little Bay, 3Porato Hill Reef, 4Rendez-vous Reef, 5Woodlands, 6Carr's Bay; 7Little Bay and Cam Bay.

8.6.2. Information from *Caribbean Turtlewatch*

Data on the in-water abundance of marine turtles were gathered via a series of methods. One of these was *Caribbean Turtlewatch*, a questionnaire designed to be completed by recreational divers/snorkelers. A copy of the form and information package are given in Appendices 2.2-2.4. More detailed methodology is given in the section 2.

There was only one dive operator in Montserrat during the duration of this project (Sea Wolf Diving School). During the period January-September 2003, Sea Wolf Diving School and their clients filled out 36 *Caribbean Turtlewatch* forms, detailing dives and turtle sightings. On 17 of these 36 occasions turtles were observed. One report was made by an independent snorkeler who observed a loggerhead turtle in water. See table 8.5 for summary of results.



Photo 8.10. Recording of turtle capture with collaborating fisherman (Photo J. Jeffers).

The completed *Caribbean Turtlewatch* surveys have illustrated that green, loggerhead and hawksbill turtles (Photo 8.11) are found in the waters of Montserrat. The latter is the most common species observed by divers. The majority of all turtles observed by divers were of juvenile/sub-adult size and not thought to be breeding individuals.

Divers were asked: *Did the chance of seeing a turtle influence your decision to choose this particular dive?* Of the 16 individuals that responded, 6 said answered yes, 9 answered no and one was unsure. When asked the questions: *How important was your turtle sighting to the enjoyment of the dive?* Nine individuals responded that the experience was very important, one responded that it was of no importance. These results combined suggest that while many divers do not set out specifically to see turtles, turtles are highly appreciate when seen.

8.6.3. Data from in-water monitoring

Personnel and logistical constraints mean that, at present, no in-water monitoring has been carried out in Montserrat other than the recording of marine turtle capture data (see section 8.7.4 below).

8.6.4. Data derived from the TCOT SEQ

All respondents were asked about perceived changes in abundance of turtles found in OT waters (Q104a-c). Responses of turtle fishers are isolated in Table 8.6 below,



Photo 8.11. Hawksbill turtle, Montserrat (Photo W. Krebs).

while all responses are shown in Table 8.7. Of the 12 former and 3 current turtle fishers, 12 noticed a change, 1 did not and 2 didn't know. As Table 8.6 shows, most turtle fishers commented on turtles in general, with fewer commenting on green and hawksbill numbers, and only 1 commenting on leatherbacks and loggerheads. In general, most fishers felt that turtles were increasing, in general and by species, for both time periods.

Of the 71 TCOT SEQ respondents, 32 noticed a change overall in in-water abundance, 9 did not, 27 didn't know, and 3 didn't answer the question. As Table 8.7 shows, patterns for the group that noticed changes are similar to those shown by fishers. Most people comment on turtles in general, and believe their abundance has increased. While the same holds true for trends in individual species, the numbers of respondents commenting are lower.

Respondents were asked about reasons for the perceived increase or decrease, both in the number of turtles nesting and found in OT waters (reasons were not distinguished by habitat). Responses (offered by 29 respondents) varied, with no single explanation dominating. Reasons cited for increases included: fewer people fishing, increased monitoring, no longer catching during breeding season, fewer people on island, and education. Reasons for decreases included: changing habitat due to volcanic activity, and over-harvest.

8.6.5. Status of marine turtle habitats and in-water threats to marine turtles

Relatively little is known of the current state of Montserrat's marine and coastal habitats with regards to suitability as marine turtle foraging areas. Its coastal shelf is relatively small (140 km²) and only generalized distributions of primary types are available (Anon 1993; Meylan 1983). Before

1995, coral communities (foraging habitats for hawksbill turtles) were found in small patches interspersed with sand and sediment on the north, south and west coasts (Gell & Watson 2000). The harmful consequences of sediments on coral reef communities and associated organisms have previously been well documented (e.g. Rogers 1990). In Montserrat, volcanic sediments are thought to have had a severe impact on reef growth, particularly in the east and southwest of the island (Gell & Watson 2000). Direct deposits of ash and waterborne sediments have led to some coral bleaching and disintegration of large sponges. Some reef areas, however, are thought to be recovering (W. Krebs. (SeaWolfe) pers. comm. 2003). In recent times, Montserrat had only 3 main sea grass beds, with the largest, 750 ha, being located at the northern tip of the island (Gell & Watson 2000), and the others on the east and west coasts. It is thought that these beds suffered considerable damage from Hurricane Hugo in 1989, although the effect on the foraging habitat for the green turtles is not known.

8.6.6. Genetics

TCOT genetic analyses have shown that the haplotypes of samples from foraging turtles collected in Montserrat have also been described in a number of other nesting sites and foraging areas (see section 10.4.5):

For wild green turtles, haplotypes described in **foraging** turtles in Montserrat have been described in **foraging** aggregations in Anguilla, Bahamas, Barbados, BVI, TCI, USA and West Africa. These haplotypes have also been described from **nesting** aggregations in Costa Rica, Mexico, USA, and Venezuela.

For hawksbill turtles, haplotypes described in **foraging** turtles in Montserrat have been described from **foraging** grounds in Anguilla, BVI, Cayman Islands, Cuba, Puerto Rico, TCI. These haplotypes have also been described from **nesting** aggregations in Anguilla, Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, TCI, and USVI.

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	4	1	0	0	8
Leatherback	1	0	0	0	11
Loggerhead	1	0	0	0	11
Hawksbill	4	1	0	0	8
General	6	1	0	0	5

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	4	1	0	0	7
Leatherback	1	0	0	0	11
Loggerhead	1	0	0	0	11
Hawksbill	4	1	0	0	7
General	5	2	0	0	5

Table 8.6. Perceived change in abundance of turtles in OT waters (in general and by species) in the last 5 years and since you can remember (n=12 fishers who noticed change)

In the last 5 years...

	Increasing	Decreasing	Same	Don't know	NR
Green	19	5	0	2	6
Leatherback	5	1	0	0	26
Loggerhead	2	0	0	0	30
Hawksbill	5	0	0	0	30
General	5	1	0	0	26

Since you can remember...

	Increasing	Decreasing	Same	Don't know	NR
Green	16	8	0	1	7
Leatherback	5	1	0	0	26
Loggerhead	2	0	0	0	30
Hawksbill	2	0	0	0	30
General	5	1	0	0	26

Table 8.7. Perceived change in abundance of turtles in OT waters (in general and by species) in the last five years and since you can remember (n=32 respondents who noticed change).

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual **nesting** colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses at the end of 2004 and more definitive answers will be available at that point. Data will be disseminated as part of a cross-territory FCO Overseas Territories Environment Programme (OTEP) –funded project that will focus on turtle Conservation, the Environment Charter and Multilateral Environment Agreements.

8.6.7. Summary

Foraging populations of green and hawksbill turtles are found in Montserrat's inshore waters, but are of unknown magnitude. Smaller numbers of loggerheads are also likely to be present.

Recommendations

8.1.3.2. Establish a systematic inwater monitoring programme

In the first instance this would assess species composition and distribution, highlighting key areas of abundance. Building upon this, effort related surveying should be carried out to allow trends in abundance to be assessed, and sampling for genetic profiling should be undertaken.

NB. Under the guidance of the Biodiversity Working Group, steps should be taken to encourage the involvement of interested local fishers in all monitoring programmes (e.g. CPUE monitoring), and financial incentives should be considered so long as they fit within the remit of a sustainable programme.

8.1.2.2. Establish Marine Protected Areas

Montserrat does not currently have any marine protected areas. It is advised that, based on holistic assessment of the marine biodiversity of Montserrat, key areas be set aside for protection.

8.1.2.3. Consider Marine Turtles as part of Planning Policy and Beach Management

Montserrat's nesting marine turtles probably represent remnants of depleted populations and are at critically low levels (see section 8.5). However, the adverse impacts of increased beachfront development on the nesting populations using Montserrat's mainland beaches must be considered in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in Montserrat, and therefore TCOT recommends the following policies:

- Ensure all development, other than non-permanent structures designed for daytime beach use, is 100m landward of the high tide mark.*
- Introduce planning regulations to mitigate the adverse impacts of development on marine turtles, including, for example light pollution, nesting female disturbance and erosion.*
- Ensure marine turtles are considered in the current beach sediment extraction projects being carried out in support of Montserrat's reconstruction. Extraction from major nesting beaches should be permanently discontinued.*

8.1.2.4. MEA legislation recommendations

The Endangered Animals and Plants Ordinance, 1976, should be amended to prohibit commercial import and export of turtles and all products of wild marine turtle species, so that this legislation fully transposes CITES to domestic law.

8.7. Direct Use of Marine Turtles in Montserrat

8.7.1. Overview

The main domestic legislation that covers marine turtle exploitation in Montserrat is the Turtles Ordinance Cap. 112 1951 (Appendix 3.5). This states that nesting females and eggs can be harvested, possessed, bought and sold from October through to May inclusive. Although there are no quotas or species restrictions, turtles captured must weigh at least 20lbs (9.07kg). In 2002, the Government of Montserrat produced a document entitled 'Turtle Act 2002' (Appendix 3.5) that has yet to be gazetted. This Act, if passed as law, will prohibit the harvest of nesting females, the harvest, sale, purchase and possession of turtle eggs, and will restrict the open season for turtle harvest to the months of December, January and February. The Act would also increase the minimum size limit of harvested turtles to 50 lbs (22.68kg). Data on use of marine turtles were gathered by combining published information, data provided by project partners, and the data gathered using

the TCOT Socioeconomic Questionnaire or SEQ (See Section 2; Appendix 2.1). In Montserrat, 71 questionnaires were completed and a breakdown of information gathered on marine turtle exploitation is digested in Table 8.8.

8.7.2. Harvests of adults on the nesting beaches

Fisheries Officers responsible for nesting beach monitoring believe that the take of turtles from nesting beaches is ongoing, although at a very low, highly opportunistic, level (1-2 turtles per year; J. Jeffers (Montserrat Dept. Fisheries) 2004). Indeed under the current legislation, such take is not illegal during periods when it might be possible to encounter them on the nesting beach, e.g. in October or May. This low level of take was confirmed by interviewees during the TCOT SEQ survey; only 1 respondent reported formerly collecting female turtles (until 15 years ago), preferring hawksbill turtles, with green turtles as second choice. The interviewee also formerly fished for turtles. His views on changes in abundance were contradictory; for one question, he stated there had been a general decline in marine turtles since he had stopped fishing in the early 1990s, as a result of over-fishing. However, on a later question, he suggested that turtle populations had increased in both the short and long term, because there are fewer fishers.

8.7.3. Harvest of eggs

As with capture of adult females, egg take is not illegal at some times of the year. Egg take continues at a low level, with eggs reputed to have aphrodisiac properties, although

Measures of direct exploitation	Past	Present	Never	NR or NA
By life stage				
Females on beaches	1	0	-	-
Eggs from beach	6	1	-	-
Turtles in water (intentional)	12	3	-	-
Turtles in water (incidental)	11	-	-	-
By product				
Meat				
Fishers who sell meat	12	1	-	-
Meat vendors	2	0	-	25
Meat consumers	32	16	-	20
Eggs				
Collectors who sell eggs	0	0	-	-
Egg vendors consumers	0	0	-	-
Egg consumers	14	1	-	-
Non-edible				
Fishers who sell shells	10	1	-	-
Shell vendors	0	0	-	-
Shell consumers	16	0	-	-
Measures of indirect exploitation				
Turtles indirectly used in business	7			
Total interviews	71			

Table 8.8. Numbers of users of marine turtles (consumptive and non-consumptive) in the past and present. Key: NR - No Response; NA - Not Applicable.

none of the egg consumers report using eggs for this reason (most report that they fry them with spices and flour for food). Buley (2001) reported that officials estimated the take to be 5-10 nests per year, taken illegally during the peak of the season. It is widely known within the society that there are a few individuals who illegally take eggs. Of the 2 individuals suggested by other interviewees as those who regularly take eggs, 1 refused to be interviewed, but the other freely admitted to taking eggs (and specified that he did so during summer months) and granted an interview.

Six former egg collectors were interviewed for the TCOT SEQ. Reasons collectors stopped included lack of interest (2), lack of opportunity (1), and in respect of the law (1). Three of the respondents stated they stopped collecting eggs more than 20 years before the survey. Of the 6, 2 collected hawksbill eggs, 1 collected green turtle eggs, and 1 didn't distinguish between species. One respondent gave his preference as hawksbills and the other 5 did not answer. None of the 6 had previously sold their eggs. The 1 current collector noted that he has not collected eggs since 2000. He collects eggs opportunistically when he sees them, rather than searching for them. He does not distinguish between species or sell eggs taken. Contrary to existing law, the interviewee reported collecting eggs in the summer months. It appears, therefore, that egg harvest does indeed carry on at a low level, but that it is not a major economic activity.

8.7.4. Harvests of turtles at sea

Rebel (1974) states that the turtle fishing industry in Montserrat is irregular, with fisheries statistics suggesting 12 nets were used in the northern district and 4 in Plymouth in 1948. A figure of 70 turtles landed at Plymouth in 1948 is given. John (1984) reported the catch of hawksbill and green turtles using spear guns and nets at Plymouth, Carr's Bay, Bunkum Bay, Sugar Bay and Farm Bay, with meat/shell/shell products being sold locally, often at Plymouth market on a Saturday.

As part of the TCOT SEQ, we interviewed 12 former turtle fishers (5 intentional, 2 opportunistic and 5 opportunistic/intentional). Greens and hawksbills were caught both intentionally and opportunistically by most fishers, and 1 fisher reported catching loggerheads. When asked what species they preferred to catch, 7 fishers preferred green turtles, 2 preferred hawksbills, 2 had no preference and 1 did not answer. None of the respondents recorded catching leatherback turtles. Methods were mostly the same for capturing greens and hawksbills, with most fishers using and spear guns (n=7) and a few using nets (n=2). One fisher reported capturing hawksbill turtles by hand.

Eleven of the 12 former fishers provided data on the magnitude of capture, either for specific species or for turtles in general. The highest number reported by any fisher was 64 (green) turtles per year, and the lowest was 1 (species unspecified). The total number of turtles caught by the 11 fishers is estimated at 224 per annum. Green turtles appear to have been the more important species,

with an average of 22 turtles caught per year by 7 fishers. The average number of hawksbills caught was 3 by 4 fishers. For turtles in general, the average caught was 6 by 7 fishers. One fisher reported catching 4 loggerheads per year.

Some fishers provided average sizes for turtles caught. For green turtles, reported sizes ranged from 100 to 450 lbs. The average of size was 276 lbs. For hawksbills, reported sizes ranged from 80 to 225 lbs, and the average size was 145 lbs. The one fisher who caught loggerheads reported a minimum size of 200 lbs and a maximum size of 300 lbs. All fishers identified October – May as the season they fished turtles. All 12 of the former turtle fishers reported selling some part of their catch. Meat, whole shell, and shell pieces were items most commonly sold. Turtle products were sold to markets (n=8), sold on streets (n=4), at the fish landing site (n=4), directly to people (n=3), and to restaurants (n=2). Of these former turtle fishers, the following were cited as reasons for cessation: job change (n=3); lack of opportunity (n=3); conservation (n=2); retirement (n=2), lack of time (n=1), lack of interest (n=1).

In spite of the seemingly low overall catch rates, the economic importance of turtles to former fishers varied: 1 ranked turtles as very important, 9 as somewhat important, and 2 as not important.

We also interviewed three current turtle fishers (2 opportunistic and 1 intentional/opportunistic). Two of these stated a preference for green turtles, and all 3 use spearguns. Rates of capture are very low (1, 2.5 and 5 turtles per season) and only one fisher provided an estimate of economic importance, who ranked turtle fishing as not important (the other two didn't answer). Only one fisher sells the meat, at a price of \$5EC per lb, directly to the consumer. We suspect some fishers are selling meat to restaurants, as 1 and possibly 2 restaurants occasionally sell dishes containing turtle meat (one restaurant owner reputed to sell turtle meat refused to be interviewed). This retail seems to be on an *ad hoc*, occasional basis and very much for local consumption.

For the period 1993 to 2003, the harvest of only 10 individual turtles were declared to the Fisheries Department (Figure 8.4.), hence a mean of 0.9 harvest per year ($\pm 1.22SD$, range = 0–4). All captures took place during the open season (October-May). One green turtle (9.1 kg) and seven hawksbill turtles (13.6 kg, 18.1 kg, 29.5 kg, 45.4 kg, 45.4 kg, 63.1 kg, 90.9 kg; mean mass (kg) = $43.7 \pm 26.9SD$) were declared to the authorities. There were two declared captures for which the species was not recorded. Using a published regression equation between mass and CCL for Hawksbill turtles ($\text{Log}_{10}(\text{mass}) = 2.8966 \times \text{Log}_{10}(\text{CCL}) - 3.8534$, with mass in kg and CCL in cm, Limpus *et al.* 1983), the masses of nesting hawksbill turtles that were measured in Montserrat were estimated to range from 43.9 to 94.8 kg. When compared to the masses of harvested turtles, it appeared that 4 out of the 7 harvested hawksbill turtles declared to authorities could have been adult turtles.

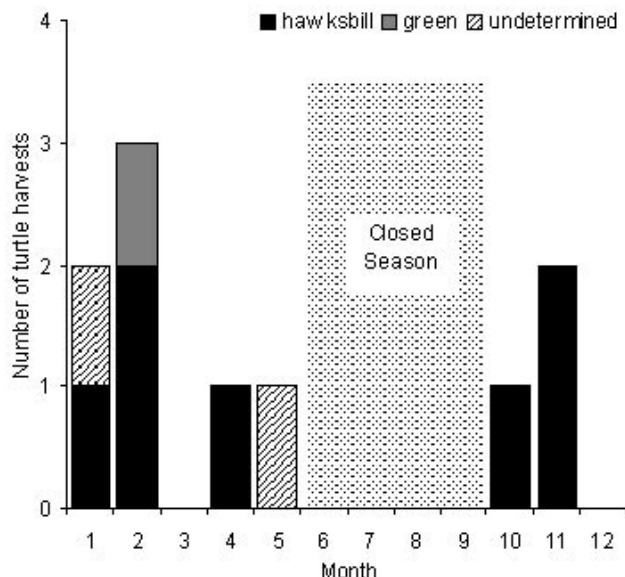


Figure 8.4. The temporal distribution of reports of turtle captures (1993-2003; N = 10 turtles). Highlighted are the closed season and the seasonal profile of nesting as recorded by the data in this study.

It is thought that the turtle fishery has declined significantly in magnitude since the extensive emigration from the island in recent years. Superimposed upon these patterns may be one of decreasing demand from some consumers (although all but 1 meat consumer interviewed as part of the TCOT survey believed that availability of turtle meat had decreased in the past 5 years and since they can remember, i.e. less turtles are being caught, butchered and sold rather than a decrease in demand). Only 10 turtles were declared to the fishing authorities for the period 1993 to 2003. Popular accounts, and the TCOT SEQ results, suggest that it is likely that this low total is the result of significant under-reporting and that clandestine harvest is carried out during the closed season. Fishers are said to avoid declaring their catch to the authorities by butchering turtle carcasses at sea, both in and outside the open season. Of great concern, as evidenced by the temporal distribution of declared turtle capture records and the fact that potential breeding adults are being captured, is that the open season for the turtle fishery overlaps significantly with the nesting season. We estimate that the total catch is likely to be 10-30 animals per year.

Of the 71 respondents surveyed, 37 formerly consumed and 16 currently consume marine turtle products. Of the former consumers, 12 stopped due to lack of availability, 7 because of conservation reasons, 5 because they had no interest, 3 because they stopped fishing, and 1 because of religion. Three didn't answer the question and 4 provided unspecific reasons, stating only that they had eaten meat 'a long time ago.' Those that stated preferences preferred green (n=5) and hawksbill meat (n=1).

Of the 16 current consumers, the only stated preference was for green turtle meat (n=4). Four current consumers purchase meat (and reported doing so during the season),

while 7 do not purchase (5 provided no answer). Those that don't purchase meat either get it as a gift or catch it themselves. The cost of purchase (provided by the 3 respondents who answered this question) was EC\$5/lb, i.e. the same price fishers report selling it. Consumption is infrequent for most current consumers; 7 respondents consume meat once a year, 5 less than once a year, 2 on a monthly basis, and 1 on a weekly basis.

8.7.5. Trade in shells and shell products

Although polished turtle shells and worked items were once for sale in Montserrat (and 10 former sellers of shell/curios were interviewed), we could not find any such products for sale during TCOT field visits, although examples were shown by local people (Photo 8.12). Only 2 artisans once involved in the turtle shell industry could be traced, 1 was interviewed and another refused. Neither makes turtle shell products any longer as there is no local demand. Indeed one shell was found discarded in a garden (Photo 8.13). Others involved in this industry appear to have emigrated from Montserrat as a result of the volcanic crisis.

8.7.6. Incidental catch in marine fisheries

The commercial fishery sector in Montserrat is quite small and no detailed profile has been carried out since the upheavals of the volcanic crisis. There are currently approximately 60 fishers using 33 small artisanal boats (M. O'Garro (Montserrat Dept. Fisheries) 2004). There are no legal industrialised vessels in Montserratian waters, but charges of illegal fishing in Montserrat's territorial waters have been levelled at USA long-liners, and Anguillian authorities have seized Taiwanese vessels that illegally set long-lines in nearby Anguillian waters (Weidner *et al.* 2001).

Eleven out of the 30 fishers surveyed reported accidentally catching turtles when fishing for something else. Of those, 7 told us what they did with accidentally captured turtles,



Photo 8.12. Johnique Fenton with decorated turtle carapace as was once produced in Montserrat (Photo C. Martin).

and most of these identified multiple actions, depending on the state of the turtle and the season. While 3 fishers would always release a turtle (1 for conservation reasons, 1 for religious reasons, and 1 with no reasons provided), the other 4 stated they would release them during closed season, but keep (to sell, use or gift) them during the open season, depending on the state of the turtle. All 11 fishers provided vague estimates of numbers of turtles caught, most of which were low. The highest number reported was 3-4 turtles per year, while the lowest was 1 in a lifetime (other responses included 'a few times in my life', 'once in a while', etc.). Methodologies likely to interact were given as gillnets (n=5), seines (n=2), fish traps (n=2), garnets (n=1). Of the 30 fishers surveyed, 21 believed that other fishers accidentally caught turtles. The fate of these turtles was described in similar terms, i.e. turtles would be released during closed season, but kept (for use, sale, and gift) during the open season (depending on the state of the turtle).

Turtle fishers were asked for their views on potential fisheries management options, and the results are shown in Table 8.9. As this table shows, there is wide support for particular types of regulations (on species caught, fishing gear, size limits and seasons). There is less support for geographic restrictions on fishing. The result re: support for size limits should be treated with caution, as no size limit (maximum or minimum) was stated. As the fishery currently has a minimum size limit, fishers may be confirming their support for this, rather than for size limits in general (i.e. they may resist a change to maximum size limits). Whatever the policies adopted, fishers see themselves and government authorities as central to policy making.

8.7.7. Summary

Based on the data gathered, direct extraction of eggs and adults from the nesting beaches appears to be minimal, and undertaken mostly for consumption. Levels of extraction at sea are also low; although most former turtle fishers did sell their products, they estimated value of this to their overall activities as somewhat or not important. Current commerce in marine turtle meat exists, but we only interviewed 1 current fisher who reported selling it. Turtle meat is the only product consumed and consumers have noticed a decrease in availability over time.

Recommendations

8.1.2.2. Establish Marine Protected Areas

Montserrat does not currently have any marine protected areas. It is advised that, based on holistic assessment of the marine biodiversity of Montserrat, key areas be set aside for protection.

8.1.2.4. MEA legislation recommendations

The Endangered Animals and Plants Ordinance, 1976, should be amended to prohibit commercial import and export of all wild marine turtle species and their products, so that this legislation fully transposes CITES to domestic law.

Recommendations

8.1.2.1. Revise Turtle Ordinance Cap 112 1951

We recommend the following based on the draft revisions drawn up by the GoM as the "Turtle Act 2002" (not yet gazetted). It should be noted however, that additional amendments to the "Turtle Act 2002" are needed:

- i) Ensure permanent and complete prohibition of the harvest of nesting female turtles and turtle eggs.*
- ii) Ensure a closed season from the 1st of March to the 30th of November inclusive, to be reviewed every 5 years (to facilitate legislative adaptation to possible nesting season shift caused by climate change).*
- iii) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum would be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length that should be stipulated in any amended legislation.*
- iv) Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg), with an equivalent minimum curved carapace length that should be stipulated in any amended legislation.*
- v) Establish a limited turtle fishing licensing scheme, whereby especially licensed turtle fishers agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including compulsory reporting to, and catch biometric measurement/sampling by, the Government of Montserrat of all turtles caught in advance of slaughter. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes.*
- vi) Ensure permanent and complete prohibition of all turtle capture methods except hand capture and use of turtle nets, with strict specifications for legal net structure and use.*
- vii) Ensure prohibition of the harvest of loggerhead and leatherback turtles.*

NB. Any continuing turtle fishery must be accompanied with systematic monitoring regimes as described below, along with a programme to monitor Catch per Unit Effort of licensed fishers, and biometrics of turtle catch, which should also be implemented by the GoM. Fisheries regulations should be revised to provide statutory powers to react to the ongoing results of the abundance trend monitoring programmes. In the event of declining abundance trends or declining Catch per Unit Effort below pre-established thresholds, the GoM must have the power to temporarily or permanently close the turtle fishery.

a	There should be regulations for which species of turtle can be caught				
	yes	no opinion	no	not app	nr
n	10	1	0	3	1
%	67	7	0	20	7
b	There should be regulations for the type of fishing gear and methods that can be used to catch turtles				
	yes	no opinion	no	not app	nr
n	9	2	1	2	1
%	60	13	7	13	7
c	There should be regulations for the number of turtles that can be caught				
	yes	no opinion	no	not app	nr
n	2	4	5	3	1
%	13	27	33	20	7
d	There should be size limits for turtles caught				
	yes	no opinion	no	not app	nr
n	8	4	1	2	0
%	53	27	7	13	0
e	Open and closed zones should be set for turtle fishing				
	yes	no opinion	no	not app	nr
n	1	6	5	2	1
%	7	40	33	13	7
f	Open and closed seasons should be set for turtle fishing				
	yes	no opinion	no	not app	nr
n	11	1	0	2	1
%	73	7	0	13	7
g	Who should be involved in the setting regulations (multiple responses allowed)				
	fishers	gov't authorities	experts	police	community
n	11	10	2	1	1
%	73	67	13	7	7

Table 8.9. Turtle fishers' views of turtle fisheries management options. Key nr - no response; not app - not applicable.

8.8. Indirect Use of Marine Turtles in Montserrat

8.8.1. Turtle watching on beaches

There is no organised turtle-watching, although several individuals do visit the beaches regularly in the hope of sighting turtles. Within the very small tourist sector in Montserrat, TCOT surveys revealed some awareness that, despite the relatively small local populations of foraging and nesting turtles, turtle-watching offered one more tangible attraction for the type of tourists most likely to come to post-eruption Montserrat. There was widespread interest for informational materials and the Government of Montserrat has begun the process of producing a video on the Marine Turtles of Montserrat. The main obstacle to setting up a turtle-watching initiative is that the low levels of nesting might seed high levels of disappointment during all but the peak season

Given the number of nesting turtles, and the possible restrictions on beach access, tourist participation in viewing nesting turtles is likely to proceed in an informal fashion. Information on correct behaviour around nesting turtles should nevertheless be publicized and distributed in the tourism sector, and tourists can be engaged in monitoring and reporting of sea turtle nesting activity.

8.8.2. Dive tourism/snorkel tours

The reefs around Montserrat are thought to be in relatively good condition (W. Krebs (SeaWolfe) pers. comm. 2004), but until recently there has been only 1 dive operator working on a part-time basis (SeaWolfe). This operator recently put the business up for sale and others on the island have expressed an interest in setting up operations. Turtles are found in Montserrat's waters at low densities, but undoubtedly contribute to the dive experience. There is 1 dive operator who will occasionally run snorkel tours if required, and turtles are occasionally sighted.

8.8.3. Aquaria holding captive turtles

There are no aquaria holding turtles in Montserrat.

8.8.4. Other marketing uses

Turtle themed curios made from non-turtle materials outside Montserrat are to be found for sale in souvenir shops, but turtles do not feature prominently as a logo other than their presence on Eastern Caribbean currency notes.

8.9. Attitudes to Conservation

TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine



Photo 8.13. Discarded turtle carapace from garden of interviewee (Photo C. Martin).



Photo 8.14. John Jeffers giving Montserrat presentation at TCOT workshop (Photo S. Ranger).

turtle management. Respondents could agree, disagree, or have no opinion. In some cases, they could choose 'not applicable'. While full details of responses to these questions have been circulated to TCOT partners, basic results are summarized here. The most common response is cited. In general, most respondents agreed that:

- It is important that sea turtles exist in the wild in the future (87%)
- As turtles are migratory, they should be managed in cooperation with neighbouring states (82%)
- Turtles play an important ecological role in our natural environment (82%)
- The government needs to actively work to protect sea turtles (76%)
- Turtles should be protected, regardless of their use to humans (72%)
- Local people should be allowed to purchase sea turtle meat (66%)
- Local people should be allowed to catch and eat sea turtles, provided it doesn't harm the regional population (63%)
- Existing laws protecting marine turtles are effectively enforced (56%)
- Some income from tourism should be used to support sea turtle conservation efforts (55%)
- Turtles should be used both as tourist attractions and as a source of food (55%)
- Turtles are culturally valuable in this OT (54%)
- Turtles should be used as a tourist attraction rather than as a source of food (49%)
- Tourists should be allowed to purchase sea turtle meat (46%)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (41%)

Close to an equal number of respondents agreed and disagreed with the following statement:

- Government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (38% agree, 32% disagree)

Most respondents disagreed with the following statements:

- Turtle fishing should be unregulated (62%)
- Turtles are economically valuable in this OT (62%)
- Turtle fishing should be stopped completely (55%)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (44%)

The results above suggest that there is most agreement among respondents on general conservation statements, i.e. it is important that sea turtles exist in the wild in the future. There is also considerable support for local capture, consumption, and sale of sea turtle meat, and for regulation of the turtle fishery. There is less strong support for tourists consuming marine turtle products.

Initial and cursory analysis of responses to these questions by stakeholder group suggests that, while there are some areas of disagreement amongst stakeholders, these are few. For example, turtle fishers as a group generally agree with the responses of the surveyed population as a whole, though their support (or lack thereof) is often stronger. There are only 2 questions for which the majority of fishers feel differently:

- Some income from tourism should be used to support sea turtle conservation efforts (73% of turtle fishers had no opinion)
- Government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (40% had no opinion, 40% disagreed)

Due to the non-random sampling employed in this survey, interpreting the results of these opinion questions in particular should be done with caution, as respondents are not representative of the Montserrat population.

Recommendations

8.1.4.2. Implement general awareness programmes regarding marine turtle conservation in Montserrat

- Raise awareness among Montserratians of the presence of distinct foraging and nesting turtle populations through informational materials and media outputs.*
- Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.*
- Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.*
- Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.*
- Develop the Montserrat specific turtle educational materials, and expand them to include further curriculum linked, multi-media educational materials where appropriate.*

8.10. Capacity Building and Outreach During TCOT

8.10.1. Capacity building

Mr John Jeffers (J.J.) of Department of Fisheries took part in the TCOT training workshop in Grand Cayman in August 2002 (Photos 8.14 and 8.15), but unfortunately no representative was available to attend the training course in Bermuda in August 2003 (the spare place was allocated instead to BVI). Montserrat partners were subject to all the generic TCOT assistance (see Section 11), but communications were at times difficult as local partners typically had poor online access and J.J. had no direct access to e-mail. The personnel deficit for turtle work in Montserrat was dealt with in three ways: 1. At the request of local partners, Dr. Corinne Martin spent one month on Montserrat, allowing an intensive marine turtle nesting survey to be undertaken as well as the execution of the socioeconomic questionnaire. 2. TCOT awareness raising events were used as a catalyst to mobilise volunteers from the local community. 3. A limited proportion of the TCOT travel and subsistence budget was used to pay local student volunteers to help with beach monitoring.

8.10.2. Outreach activities

Montserrat has been part of the generic dissemination outputs of the TCOT project (see section 12), but in collaboration with project partners we were particularly successful in attaining media items. This was particularly true of the multi-taxon awareness raising week organised by RSPB in June 2002. As part of this week, some 30 local people who had not previously observed turtle nesting



Photo 8.15. Taking part in inwater monitoring session (Photo S. Ranger).



Photo 8.16. Biodiversity people with Montserrat schoolchildren.

participated in an interpreted turtle walk and witnessed the nesting of a hawksbill turtle. A number of community and school groups (Photo 8.16) met with a range of biodiversity professionals, local and overseas, to discuss the importance of Montserrat's biodiversity and a modest display was created, which now forms part of the exhibits in Montserrat National Trust (Photo 8.17).

Recommendations

8.1.1.1. Increase the capacity of the Government of Montserrat

- a) *Ensure GoM has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes.*
- b) *Ensure that key staff in GoM have the skills to apply for external funding to support biodiversity related projects.*
- c) *Ensure that all new Fisheries Officers are adequately trained in marine turtle biology, as well as research and conservation techniques.*
- d) *Ensure that adequate expertise is in place to allow for the process of legislative review.*

8.1.1.2. Increase the capacity of the Montserrat National Trust

As part of a general increase in staffing and resources of the Montserrat National Trust, one of the urgent needs is for a project officer who can lead outreach campaigns, and support/ liaise with the many international organisations currently involved in biodiversity work in Montserrat. This officer's duties should include coordinating these various efforts, whether they involve provision of funds, staff, equipment, training or advice.

8.1.1.3. Establish a multi-stakeholder biodiversity management process

Identify and establish a Biodiversity Working Group to include representatives of all interest groups and stakeholders (e.g. government agencies and departments including Planning and Tourism; NGO's; hoteliers; dive operators; construction industry representatives; fishers; schools and specially-interested members of the public). The working group should meet regularly to discuss, decide and advise government on biodiversity management issues working to implement Montserrat's Environment Charter, marine turtles being one key subject areas. With regard to marine turtles, particular attention should be paid to direct and indirect fishery interactions, habitat protection, exploring possibilities for sourcing funding, further research/population monitoring, as well as investigating potential economic benefits of marine turtle conservation, and should seek external advice from appropriate experts. There may be a need to provide support for participation by some sectors (i.e. cover travel costs to meetings). In other OT's it has been recommended that a specific group be assembled for marine turtles, but it is felt that, at this stage, a single focus group is more likely to succeed and make significant inroads, given limited resources on Montserrat.

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.



Photo 8.17. Turtle display at Montserrat National Trust (Photo B. Godley).

8.11. Acknowledgements

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An Assessment of the Status and Exploitation of Marine Turtles in the Turks and Caicos Islands





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

9. Status and Exploitation of Marine Turtles in the Turks and Caicos Islands (TCI)

Contents	Page
9.1. Summary and Recommendations	181-185
9.2. Geographical Overview	186-187
9.3. Historical Overview	187
9.4. Organisations Involved with Marine Turtles in TCI	188-189
9.5. Status of Nesting Marine Turtles in TCI	189-193
9.5.1. Monitoring efforts	189-191
9.5.2. Genetics of nesting populations	191
9.5.3. Data from TCOT SEQ	191
9.5.4. Threats to TCI's nesting populations	192-193
9.6. Status of Foraging Marine Turtles in TCI	193-201
9.6.1. Monitoring efforts	195-197
9.6.2. Genetics of foraging populations	198-199
9.6.3. Threats to TCI's foraging turtle populations	199-201
9.6.4. Data from TCOT SEQ	
9.7. Direct Use of Marine Turtles in TCI	201-217
9.7.1. Data form TCOT SEQ	204
9.7.2. Harvest of adults on the nesting beach	205
9.7.3. Harvest of eggs	205-206
9.7.4. Harvest at sea	206-210
9.7.5. Trade in turtle meat	210-215
9.7.5.1. Sale of meat by turtle fishers	210-211
9.7.5.2. Sale of meat by direct vendors	211-213
9.7.5.3. Consumption of turtle meat	213-215
9.7.6. Trade in shells and shell products	215
9.7.6.1. Sale of turtle shells	215
9.7.6.2. Sale of shell pieces	215
9.7.7. Incidental catch in marine fisheries	216-217
9.8. Indirect Use	217-218
9.8.1. Turtle watching on beaches	217
9.8.2. Dive/snorkelling tourism	217
9.8.3. Aquaria holding marine turtles	218
9.8.4. Gift shops	218
9.8.5. Data from the TCOT SEQ	218
9.9. Attitudes to Conservation	218-219
9.10. Capacity Building and Outreach Activities During TCOT	220
9.10.1. Capacity building	220
9.10.2. Outreach activities	220
9.11. Acknowledgements	221
9.12. References	221-222

9.1 Summary and Recommendations

Summary

At least two species of marine turtle (green and hawksbill turtles) nest in the Turks and Caicos Islands (TCI; see table 9.1.) but these nesting populations appear to have decreased and nesting is now limited to remote cays. Little coordinated marine turtle research or conservation management has been undertaken in TCI and much needs to be done to ensure the continued existence of the country's nesting marine turtle populations. Foraging green and hawksbill turtles are widespread in TCI's coastal waters, and may represent regionally significant populations of both these species despite having been subject to direct exploitation for a long period of time. Direct exploitation still occurs and we estimate that between approximately 240 and 1,130 green turtles and between approximately 180 and 900 hawksbills are likely taken per year in directed fishing effort. In addition, approximately 190 turtles (green and hawksbills) may be incidentally caught on hook and line or in gill nets by TCI fishers each year, the majority of which are consumed. These populations are therefore subject to the largest legal take of marine turtles in the UK Overseas Territories in the Caribbean. Marine turtles are also used indirectly by the tourism industry, both as natural attractions and as saleable icons of the TCI.

TCOT recommends that the Government of the Turks and Caicos Islands takes all necessary steps to ensure the recovery of its nesting marine turtle populations and the sustained existence of its foraging populations. With amended legislation, increased regulation and enforcement,

and nominal investment in educational outreach, research, monitoring and fishery management, the TCI turtle fishery has the potential to be sustainable, and meet the demands of TCI tradition without threatening the existence and value of TCI's turtles as natural attractions.

This will require actions under the following headings:

9.1.1. Increase capacity for marine turtle management in the Turks and Caicos Islands

- 9.1.1.1. Increase the capacity of the Department of Environment and Coastal Resources and the Protected Areas Department.
- 9.1.1.2. Establish a multi-stakeholder marine turtle management process.

9.1.2. Amend legislation and policy to facilitate marine turtle population recovery

- 9.1.2.1. Amend harvest legislation.
- 9.1.2.2. Amend Planning Policy and Beach Management.
- 9.1.2.3. Recommendations regarding Multilateral Environmental Agreements and TCI national legislation.

9.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

- 9.1.3.1. Establish systematic monitoring efforts at index nesting beaches.
- 9.1.3.2. Establish systematic monitoring efforts at index foraging sites

Species	Nesting	Foraging	Harvest
Green Turtle (<i>Chelonia mydas</i>)	Yes, probably in very small numbers	Adults and juveniles present Large numbers of juveniles in some areas	Relatively high levels of legal, unmonitored harvest at sea. Some illegal take of undersized specimens Low levels of illegal egg harvest
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Moderate numbers, the most frequently encountered species nesting in TCI	Adults and juveniles present Large numbers of juveniles in some areas	Relatively high levels of legal, unmonitored harvest at sea. Some illegal take of undersized specimens Low levels of illegal egg harvest
Leatherback Turtle (<i>Dermochelys coriacea</i>)	No nesting in TCI	Occasionally seen offshore	No harvest
Loggerhead Turtle (<i>Caretta caretta</i>)	Possibly, but probably in small numbers	Adults and juveniles occasionally encountered	Occasional legal harvest of adults

Table 9.1. Marine turtle species and summary of harvest in TCI.

9.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting the Turks and Caicos Islands to marine turtle conservation requirements

9.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

Specific recommendations

9.1.1. Increase capacity for marine turtle management in the Turks and Caicos Islands

TCOT has contributed to the skills and technical knowledge of one current TCI Department of Environment and Coastal Resources (DECR) officer. However, further capacity building efforts to increase DECR and Protected Area Department staff knowledge and skills with respect to marine turtle biology, conservation and research would be greatly beneficial to TCI turtle conservation. The Department's enforcement patrol, research and monitoring capacity is currently compromised due to a shortage of staff and a limited budget. It is essential that the DECR receives adequate resources to effectively carry out their custodianship of TCI's highly valuable marine and coastal resources on which the country's economy so heavily depends.

To date there has been no long-term dedicated marine turtle research in the Turks and Caicos Islands, and no dedicated decision-making process that involves all

stakeholders in the management of TCI's turtle fishery. TCOT SEQ indicated that there was a general acceptance of the importance of marine turtle conservation in TCI. Future conservation measures in TCI will only be effective if they are accepted by the public, and to facilitate such acceptance, stakeholders must have meaningful input into a decision-making process. Such a process would be most cost-effective if established under existing and appropriate Advisory Committees (e.g. Scientific Authority and/or the Fisheries Advisory Committee). Alternatively, the conservation of marine turtles and their habitats could be considered by advisory groups established and committed to overseeing the implementation of the Environment Charter in TCI.

9.1.1.1. Increase the capacity of the Department of Environment and Coastal Resources (DECR) and the Protected Areas Department (PAD)

- a) Ensure DECR/PAD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes. Given the importance of all natural resources in the network of Protected Areas, and apparent poor compliance with the National Parks Ordinance, TCOT recommends that an increased capacity to effectively patrol the protected areas should be treated as a priority.
- b) It is recommended that national and international funding is sourced to support further capacity-building, as well as dedicated marine turtle population monitoring, turtle genetic sampling, turtle fishery monitoring and turtle conservation awareness and outreach programmes.
- c) Ensure that all new research and conservation staff are adequately trained in marine turtle biology, as well as research and conservation techniques.

9.1.1.2. Establish a multi-stakeholder marine turtle management process

- a) Identify and establish a marine turtle conservation and management advisory process under the Scientific Authority and/or the Fisheries Advisory Committee. This process should be led and co-ordinated by the DECR and should encourage input from representatives of all interest groups and stakeholders (e.g. government agencies and departments such as DECR and PAD, Department of Planning, TCI Tourist Board; NGO's such as the TCI National Trust; hoteliers; dive operators; construction industry representatives; fishers; schools and colleges and specially interested members of the public). Scientific Authority and/or Fisheries Advisory Committee meetings should discuss marine turtle management issues and advise DECR decisions, paying particular attention to the turtle fisheries, habitat protection, exploring possibilities for sourcing funding, further research/population monitoring, education and

outreach, as well as investigating potential economic benefits of marine turtle conservation. When necessary, DECR could also seek external advice from appropriate experts. It is recommended that appropriate stakeholder input is facilitated by stakeholder attendance at some meetings, with financial support being offered by the Government of TCI (e.g. support of stakeholder inter-island travel etc) when necessary.

9.1.2. Amend legislation and policy to facilitate marine turtle population recovery

The turtle fishery in the Turks and Caicos Islands incurs the largest legal take of marine turtles in the UK Overseas Territories in the Caribbean. From a biological perspective, the Fisheries Protection Ordinance 1998 does not facilitate the sustained management of TCI's nesting and foraging populations of marine turtles. TCOT recognises that a cessation of all turtle fishing would significantly contribute to the recovery of depleted turtle populations. However, TCOT recognises that turtle meat is a component of the traditional TCI diet, and that a demand for turtle meat remains amongst TCI's residents and visitors. TCOT SEQ suggests that foraging turtle populations may be either stable or increasing, indicating that a ban on turtle fishing in TCI would not receive majority support and that such a ban would probably present significant enforcement problems. However, we recommend that future harvest of turtles must be carried out in a highly regulated and controlled manner, with legislation in place to permanently and strictly protect adult turtles, programmes established to monitor stock abundance, and mechanisms in place to reduce or close the fishery in response to measured decreases in turtle stock. It is important to note that the DECR must have the skills, as well as the human, technical and financial resources to effectively manage the fishery.

TCOT recommends a number of legislative changes required to increase the likelihood of sustainability of a turtle harvest in TCI. In addition, it is noted that the regulation of use alone will not serve the sustainable management of turtles in the Turks and Caicos Islands. TCOT therefore also makes recommendations regarding the promotion and publicising of the National Parks Ordinance 1998, which should protect critical marine turtle habitat (see section 9.1.4.2).

9.1.2.1. Amend harvest legislation:

TCOT recommends that the Fisheries Protection Ordinance, 1998 is amended to include the following provisions:

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for green and hawksbill turtles that should be stipulated in any amended legislation.

- b) Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for green and hawksbill turtles that should also be stipulated in any amended legislation.
- c) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers are required to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to DECR (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by DECR. Quotas should be reactive and based, inter alia, on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The DECR should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level.
- d) Establish a closed season (see NB below) to be reviewed every five years (to facilitate legislative adaptation to possible nesting season shift caused by climate change) to prevent capture of adult turtles entering TCI's waters to breed.

NB. Estimates of composite turtle nesting seasonality for green, hawksbill and loggerhead turtles in TCI, based on regional seasonalities, suggest that while turtle nets are still used in TCI, the ideal closed season would extend from the 1st of April to the 31st of January inclusive (see section 9.5.1). However, it is important to note that no evidence of loggerhead nesting has been recorded in TCI in the last 20 years. TCOT also acknowledges that almost all turtles currently caught in TCI are caught by hand and the use of spearguns and Hawaiian slings is already prohibited. Therefore, if the suggested maximum size limits are introduced, and the use of turtle nets is prohibited as suggested below, then accidental, fatal capture of adult turtles entering TCI's waters to breed will be unlikely. Furthermore, the introduction of a 10 month closed season to the current fishery may present significant enforcement difficulties for the DECR. TCOT therefore suggests that a preliminary 6 month closed season from the 1st of July to December the 31st be considered, to encompass the majority of both the green and hawksbill turtle nesting seasons. This can be reviewed in the future when systematic rookery monitoring, as suggested below, reveals the actual composite turtle nesting season in TCI.

- e) Establish regulations with regard to the type of gear that can be used to capture turtles. Possible regulations could ensure permanent and complete prohibition of all turtle capture methods except hand capture (i.e. jumping turtles from a boat and in-water hand capture using only hands and lobster hook) as suggested by turtle fishers during TCOT SEQ.
- f) Ensure prohibition of the harvest of loggerhead and leatherback turtles given their very low numbers in TCI.

NB. It is important that all legislative changes are designed under the marine turtle conservation and management advisory process in consultation with the fishing community. Forty-two % of the turtle fishers surveyed said that they thought fishers should be consulted when regulations are set.

9.1.2.2. Amend Planning Policy and Beach Management

Historical records suggest that marine turtle nesting populations in TCI have been subject to prolonged harvest and therefore, while trends in abundance of nesting turtles are unknown, these populations may represent remnants of depleted populations. However, the adverse impacts of increased beachfront development on the nesting populations using TCI mainland beaches must be considered, in addition to the potential adverse impacts of turtle harvest. Every effort should be made to protect the remaining turtle nesting habitat in TCI, and therefore TCOT recommends the following:

- a) Where possible, protected status should be extended to all nationally important nesting sites within TCI.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, nesting female disturbance and erosion on all other nesting beaches.
- c) Where the extension of protected status to identified nesting beaches is not possible, TCOT recommends that TCI Government ensures, as a matter of priority, that any development occurring adjacent to important turtle rookeries is undertaken sensitively under the planning regulations mentioned above, to mitigate disturbance and destruction of habitat.
- d) Under the guidance of the marine turtle conservation and management process, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings (e.g. property lighting regimes).

9.1.2.3. Recommendations regarding Multilateral Environmental Agreements and TCI national legislation

- a) CITES should be extended to TCI as soon as possible, and the appropriate domestic legislation drafted and gazetted, to address the possible trade of hawksbill scutes from TCI to neighbouring states.
- b) Given that Article III of CMS accommodates the needs of traditional subsistence users of marine turtles, the Government of TC should consider the role of trade in the subsistence fishery economy of TCI, and limit commercial activities regarding the sale of turtle products.

NB. CITES does not currently extend to TCI and TCOT SEQ corroborates previous reports that suggest there is limited trade in hawksbill turtle shell between TCI, the Dominican Republic and possibly Haiti. TCOT SEQ also suggests that turtle meat may be occasionally and illegally smuggled into the USA via Miami.

9.1.3. Establish systematic monitoring of marine turtle populations to determine trends in abundance

The Turks and Caicos Islands host nesting populations of green and hawksbill turtles, and possibly loggerhead turtles. TCI's waters host regionally significant foraging populations of green and hawksbill turtles, with occasional loggerhead turtles also reported. A lack of recent systematic surveys means that knowledge on abundance and trends in abundance of nesting and foraging populations is absent. Trends in abundance will only be determined by long-term systematic monitoring. In order to understand the conservation status of these populations and inform effective conservation management (e.g. establishment of an appropriate closed season) it is vital to work towards establishing data that will reveal any trends in their abundance, and seasonality of nesting. TCOT therefore recommends, as a matter of priority, that the following monitoring programmes be established, under the guidance of the marine turtle conservation and management advisory process:

9.1.3.1. Establish systematic monitoring efforts at index nesting beaches

- a) Seek funds for and establish a comprehensive survey of the beaches of TCI to identify key nesting sites. Ideally, this should involve aerial surveys carried out on at least a monthly basis from April to February inclusive, for three consecutive nesting seasons. These surveys should be followed up by ground truth surveys at sites that show the most nesting activity. Once these 'index' nesting sites have been identified, TCOT recommends that they are regularly monitored on foot (e.g. at least twice a month during the nesting season) to ascertain trends in nesting abundance. Surveys of index nesting sites undertaken in this way should also facilitate extensive genetic sampling to further establish the genetic identity of TCI's nesting turtle populations.

NB. While turtle nesting in TCI appears to be limited to remote cays, this programme should preferably engage local interest groups and residents whenever possible, to facilitate local interest in marine turtle nesting populations. Due to the remoteness of most rookeries, the future development of this programme to incorporate revenue-generating tourist turtle walks is limited, and would only ever appeal to a highly specialised market

9.1.3.2. Establish systematic monitoring efforts at index foraging sites

- a) Seek funds for and establish a systematic aerial survey of TCI's waters (perhaps in conjunction with recommendation 9.1.3.1) to understand the current distribution of turtles and identify index foraging sites. Through these surveys, index foraging sites should be identified, and frequently (e.g. once per month) and systematically monitored via boat/snorkel surveys or CPUE sampling to assess trends in abundance of TCI's foraging turtle populations.

- b) Expand the sampling regime initiated under TCOT to establish the genetic 'identity' of TCI's nesting and foraging populations. This sampling could be included as part of the surveys mentioned above. The participation of turtle fishers should be encouraged where practicable. Sampling should be extensive and should include an assessment of the prevalence of fibropapilloma (FP) in the foraging, and if possible, nesting turtle populations.

NB. Systematic monitoring at index foraging sites will be essential to assess trends in abundance of foraging populations, and therefore generate the data necessary to responsibly manage TCI's turtle fishery. Under the guidance of the marine turtle conservation and management advisory process, steps should be taken to encourage the involvement of interested local fishers in all monitoring and sampling programmes, and financial incentives to facilitate participation should be considered so long as they fit within the remit of a sustainable programme.

- c) Caribbean Turtlewatch has the potential to monitor certain regularly used dive sites for presence and absence of turtles, but requires dedicated staff time to liaise with willing dive operators, and treat data generated through the programme. TCOT recommends that if resources allow, DECR/ PAD continue and maintain Caribbean Turtlewatch with current participating dive operators in Providenciales as a relatively cheap method of monitoring turtle abundance at index foraging sites.

9.1.4. Establish further conservation and awareness programmes to sensitise those living in and visiting TCI to marine turtle conservation requirements

Increased awareness of turtles and their conservation requirements in the Turks and Caicos Islands can provide short and long-term mitigation against the threats faced by marine turtles due to development. TCOT recommends the following actions, to be implemented under the guidance of marine turtle conservation and management advisory process, to facilitate public contribution to marine turtle conservation:

9.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies.
- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure DECR has the capacity to collect, necropsy and document all strandings.
- c) Raise awareness through a dedicated campaign to sensitise Islanders to the importance of protecting the nests of such small nesting populations, and

to encourage reporting of any illegal take of eggs or nesting females.

- d) If nesting activity is detected on developed beaches, DECR should develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings, and distribute in the form of an accessible leaflet.
- e) Where possible, ensure school participation in any rookery monitoring programmes to sensitise children to importance of rookery protection

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- a) Raise awareness among residents of the presence in TCI of distinct foraging and nesting turtle populations that contribute to the regional turtle populations, through informational materials and media outputs.
- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.
- c) Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.
- d) Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.
- e) Develop the TCI National Trust conservation awareness programmes to include curriculum-linked, multi-media marine turtle related educational materials, and expand these programmes to include all schools, with those located in key fishing communities in TCI, as priority.

9.2. Geographical Overview

Forming the south-eastern extremity of the Bahamas chain, The Turks and Caicos Islands lie 145km north of Haiti and the Dominican Republic and 925 km south-east of Miami at approximately 21° 45N, 71° 35W (FCO 1999). There are approximately 40 low-lying islands and cays in the Territory (all <76m above sea-level), covering a total land area of about 500km² with only six of the main islands and a few of the small islands currently inhabited.



Photo 9.1. Grand Turk (Photo P. Richardson).



Photo 9.2. The extensive and largely pristine wetlands of North, Middle and East Caicos are fed by a complex of tidal creeks that provide foraging habitat for turtles (Photo P. Richardson).



Figure 9.1. Map of the Turks and Caicos Islands.

Over half of the land area consists of wetlands (Proctor & Fleming 1999). The Territory sits on three limestone platforms, the Caicos Bank, the Turks Bank and the Mouchoir Bank (see figure 9.1). The Caicos Bank is the largest (6,140km²), and to the north is fringed with extensive coral reefs and steep drop-offs, extending along the northern shores of the Provinciales and the Caicos Islands. The majority of Caicos Bank to the leeward of these islands is shallow and sandy, with vast sea grass beds, dominated by *Thalassia testudinum* close to the main islands and a few small cays at the southern extremity of the Bank (Carr *et al.* 1982; Gaudian & Medley 2000; Rudd 2003). The extensive and largely pristine wetlands of North, Middle and East Caicos are fed by a complex of tidal creeks, commonly vegetated by sea grass and algae, and an extensive area encompassing these wetlands, tidal creeks and inshore seagrass beds was declared a Ramsar Convention Wetland of International Importance in 1990 (Fletemeyer 1983; Proctor & Fleming 1999). Grand Turk, Salt Cay and associated cays lie on the Turks Bank (324 km²), which consists mostly of a sandy bed, with extensive coral reefs and mixed coral and algae beds, while Mouchoir Bank further east is largely coral and sand (Rudd 2003).

The main inhabited islands are Grand Turk (the capital), Providenciales (most populated), South Caicos (the main fishing settlement), Middle Caicos, North Caicos and Salt Cay. The total population in 1998 was estimated at 20,000, including approximately 10,000 foreigners, mostly from Haiti and the Dominican Republic (FCO 1999). In 2000, the GDP per capita stood at US\$9,600. Limited rainfall, poor soil and a limestone base have rendered the islands generally unsuitable for agricultural development and the TCI economy is based mainly on tourism and offshore finance. Tourism provides the highest revenue, with 110,855 tourist arrivals using about 2,500 hotel rooms in 1998 (J Skippings (formerly TCI Tourism Board) pers. comm. 2002).

After offshore finance, fishing is the third most important activity, and is the main employment sector on South Caicos (Proctor & Fleming 1999). The two most important fisheries are for lobster (*Panulirus argus*) and Conch (*Strombus gigas*). Most of the lobster and conch that is processed by TCI's fish processing plants is exported to the USA, and it is thought that at least equal, but unrecorded, amounts of conch and lobster are consumed locally (Rudd 2003; B Riggs (DECR) pers. comm. 2004). The local currency is the US Dollar.

9.3. Historical Overview (pre-20th Century)

The Turks and Caicos Islands' extensive reefs and seagrass beds host large foraging populations of juvenile and sub-adult green and hawksbill turtles, with some foraging loggerhead turtles also reported (Carr *et al.* 1982; Fleming 2001; Fletemeyer 1983) (see section 9.6). The numerous beaches on TCI's islands and cays host what is thought to be low-level nesting populations of green, hawksbill and possibly loggerhead turtles (Fletemeyer 1983) (see section 9.5). Leatherbacks may also be occasionally encountered in TCI's offshore waters, but do not nest there (Carr *et al.* 1982).

Pre-Columbian use

These turtle populations have been exploited as a food source in TCI since they were first colonised in about 700AD. Archaeological digs on Grand Turk have revealed that the early Tainos Indian settlers derived 77% of their calories from turtle. The Coralie site (GT-3) on Grand Turk is the island's oldest known human settlement, and work there has revealed the large skull of a loggerhead turtle, estimated to have weighed 1,000lbs when alive, as well as bones of at least 50 green turtles, some exhibiting spearholes. Bones were from specimens of adult, sub-adult and hatchling green turtles, with 85% of the bones coming from juvenile and sub-adult specimens, although nesting females and eggs are also thought to have been harvested (Carlson 2000; Fleming 2001). A hoe made from turtle bone was also discovered at an archaeological site in a cave on Providenciales (Sadler 1997).



Photo 9.4. Turtle carapace bones, showing spear holes, found at Taino archaeological sites on Grand Turk (Photo B. Carlson).



Photo 9.3. Lobster and conch are the TCI's most important fisheries, while finfish and turtles are also taken (Photo P. Richardson).

Use in post-Columbian TCI to the 19th Century

The Tainos inhabited TCI up until at least the late 15th Century, when Columbus 'discovered' Grand Turk in 1492 (Sadler 1997), and were probably dependent on turtles to some extent for as long as they inhabited the islands. After the arrival of the Europeans, Caribbean Indian tribes were decimated by the slave trade, but turtles continued to be utilised in the Turks and Caicos by visiting Europeans (Sadler 1997). Later, in the 18th Century, the TCI had been claimed as British Territory, and the British Government dispatched ships and over 1,000 men from Bermuda to the Turks and Caicos Islands to collect salt in the many lagoons. These operations often lasted 10 to 12 months in which time the workers ate locally harvested food including turtle meat and iguana (Sadler 1997).

By the late 19th Century, Britain was benefiting from a lucrative salt trade from TCI, but also exported sisal, sponge, conch and turtle shell, with £56 of shell exported in 1887, rising to £1,768 worth of shell exported in 1906 (in Sadler 1997). Records from 1849 suggest that green turtles were harvested for their meat, especially at the mouth of North Creek, Grand Turk, and exported to New York (Fleming 2001).

9.4. Organisations Involved with Marine Turtles in TCI

9.4.1. Department of Environment and Coastal Resources (DECR)

The DECR were the key TCOT project partners in TCI, providing excellent advice, staff time, as well as technical and logistical support. Two officers from the DECR attended the TCOT Workshop in Grand Cayman, and one of these also attended the training course in Bermuda in August 2003. Prior to working on TCOT, the DECR had carried out no dedicated marine turtle research or monitoring.

The DECR is a large department with 30 full-time staff, a few part-time staff including a Fisheries sub-department, as well as the Protected Area Department (PAD) that was formally created in 2003. There are DECR offices at the new National Environment Centre (HQ of PAD), Grand Turk (DECR HQ) and South Caicos (office of the Chief Fisheries Officer). DECR have several vehicles and vessels, including two large enforcement patrol boats, a shallow-draught jet boat, as well as some smaller patrol boats and whalers. The DECR is responsible for enforcing several key pieces of legislation relevant to marine turtle management, including the Fisheries Protection Ordinance, Revised Edition 1998 and the National Parks Ordinance, Revised Edition, 1998, and is regularly consulted by other government departments with respect to other key issues such as planning, tourism development and education (M. Fulford-Gardner (DECR) pers. comm. 2003).



Photo 9.5. One of the DECR's fast patrol boats (Photo P. Richardson).

DECR belong to various inter-agency working groups and committees, including the statutory Fisheries Advisory Committee that provides recommendations on fishery management; the National Parks Environmental Advisory Committee that provides recommendations on National Park management and disburses a *Conservation Fund Micro-Projects Programme*; a CITES Working Group that meets quarterly to steer the necessary preparations for CITES extension; and a Scientific Authority that also meets quarterly to discuss and advise on current and planned research programmes in TCI (M Fulford-Gardner (DECR) pers. comm. 2002). DECR also coordinate the National Fishermen's Day, traditionally held in July on South Caicos, where fishers and appropriate agencies meet to discuss fisheries issues and celebrate the TCI fisheries sector. Two DECR officers participated in TCOT capacity-building initiatives, but one of these officers has since left the department. To date, the DECR have not instigated any systematic marine turtle research or conservation programmes, and Fleming (2001) states that the DECR is '*hampered in its efforts to manage and conserve marine life by a shortage of staff*'. DECR communications with DECR management suggest that DECR staff time is over-committed to the various programmes the department is currently involved with, and have little time to dedicate to marine turtle conservation or research (J. Campbell (DECR) pers. comm. 2003).

9.4.2. Turks & Caicos National Trust

The Trust is based on Providenciales, and in 2002 had 200 adult members and 80 junior members. Recently the Trust has been involved in various conservation projects. These include the conservation of Rock Iguanas on various Cays and the conservation of various historical sites. The Trust has also been a key partner in the Darwin Project to establish a management plan for the Ramsar site on North, Middle and East Caicos. The Trust did not have an active involvement in TCOT due to staff commitments, but certainly has the capacity to contribute to future turtle conservation initiatives. The Trust has a strong focus on education, and runs a schools awareness programme and produces "Eco-echoes", a quarterly newsletter for their junior supporters. The Trust is considering reintroducing 'Tessa', an old turtle character from previous "Eco-echoes" editions, in order to publicise turtle conservation efforts in TCI.

Recommendations

9.1.1.2. Establish a multi-stakeholder marine turtle management process

- a) Identify and establish a marine turtle conservation and management advisory process under the Scientific Authority and/or the Fisheries Advisory Committee. This process should be led and co-ordinated by the DECR and should encourage input from representatives of all interest groups and stakeholders (e.g. government agencies and departments such as DECR and PAD, Department of

Planning, TCI Tourist Board; NGO's such as the TCI National Trust; hoteliers; dive operators; construction industry representatives; fishers; schools and colleges and specially interested members of the public). Scientific Authority and/or Fisheries Advisory Committee meetings should discuss marine turtle management issues and advise DECR decisions, paying particular attention to the turtle fisheries, habitat protection, exploring possibilities for sourcing funding, further research/population monitoring, education and outreach, as well as investigating potential economic benefits of marine turtle conservation. When necessary, DECR could also seek external advice from appropriate experts. It is recommended that appropriate stakeholder input is facilitated by stakeholder attendance at some meetings, with financial support being offered by the Government of TCI (e.g. support of stakeholder inter-island travel etc) when necessary.

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- a) *Raise awareness among residents of the presence in TCI of distinct foraging and nesting turtle populations that contribute to the regional turtle populations, through informational materials and media outputs.*
- b) *Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.*
- c) *Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.*
- d) *Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.*
- e) *Develop the TCI National Trust conservation awareness programmes to include curriculum-linked, multi-media marine turtle related educational materials, and expand these programmes to include all schools, with those located in key fishing communities in TCI, as priority.*

9.5. Status of Nesting Marine Turtles in TCI

There has been only one systematic survey of nesting in TCI, when Fletemeyer (1983) carried out partially ground-truthed aerial surveys in 1982, the results of which are shown in Table 9.2. Fleming (2001) states that in the early 1990's a DECR officer carried out 'beach surveys and tagging exercises' but DECR could not locate any data or reports arising from this survey during TCOT. From his surveys, Fletemeyer (1983) estimated that the TCI hawksbill nesting population consisted of between 125 to 275 nesting females, the green turtle nesting population

consisted of between 45 and 105 nesting females, and the loggerhead nesting population consisted of between 25 and 75 females. However, he stated that his estimates of the green and loggerhead populations were made with little confidence and were based on conversations with fishers and divers rather than actual nest counts, with hawksbill nests being the most commonly encountered during his surveys. Ehrhart (1989) later used Fletemeyer's estimate of loggerhead nesting to claim that loggerheads nest in regionally significant numbers in TCI, a claim that has recently been repeated in the literature (Fleming 2001; Proctor & Fleming 1999).

9.5.1. Monitoring efforts

Due to logistical reasons, TCOT was unable to carry out a systematic survey of nesting in TCI. However, as indicated in table 9.2, TCOT did record some turtle nesting activity and conversations with fishers during the TCOT SEQ indicate that some nesting still occurs on the Cays. Table 9.2 also shows where Fletemeyer recorded nesting activity either through physical surveys or through interviews with fishers.

TCOT surveys indicate that low-level nesting occurs on several of the remote Cays and along the northern shores of the North and Middle Caicos, while nesting populations on Providenciales, Grand Turk and Salt Cay appear to have been largely extirpated. TCOT has confirmed that some



Photo 9.6. Peter Richardson and Jasmine Parker (DECR) inspect a recently emerged hawksbill nest on Fish Cay (Photo S. Ranger).

LOCATION	SPECIES	SOURCE
West Caicos (PA - most westerly beaches lie within West Caicos Marine National Park)	Ei, Cm, poss. Cc	Fletemeyer 1983 (TCOT interviews indicated some nesting still occurs on west shore)
Providenciales (PA - NW Point Marine National Park encompasses most westerly beaches, with the remainder within Pigeon Pond and Frenchman's Creek Nature Reserve)	Ei, poss. Cm, Cc	Fletemeyer 1983 (TCOT interviews indicated that beaches at NW Point and further south were nesting beaches in the 1950's. TCOT found no evidence of nesting on NW Point, Providenciales Sept 2003)
Water Cay	Ei, poss. Cm, Cc	Fletemeyer 1983
Pine Cay	Ei, Cm poss Cc	Fletemeyer 1983
Stubbs Cay (PA –within Fort George Land and Sea National Park)	Ei	Fletemeyer 1983
Parrot Cay	Ei, poss. Cm, Cc	Fletemeyer 1983
North Caicos (PA - beaches on East Bay Islands National Park are protected)	Ei, poss. Cm, Cc	Fletemeyer 1983 (TCOT interviews indicate that some nesting still occurs on north shore)
Highas Cay	Ei, Cm, poss. Cc	Fletemeyer 1983 (TCOT interviews indicate that some nesting still occurs on north shore, with one fisherman suggesting this is a nationally important rookery)
Middle Caicos	Ei, Cm, poss. Cc	Fletemeyer 1983 (TCOT confirmed Ei nesting Sept. 2003)
East Caicos (PA - some northerly beaches lie within International Ramsar site)	Ei, Cm, Cc	Fletemeyer 1983 (TCOT interviews indicate that the beaches along the north shore of East Caicos may host nationally important turtle rookeries)
Long Bay (East Caicos)	Poss. Ei	Fletemeyer 1983 (TCOT interviews indicate that these beaches may host nationally important turtle rookeries)
Grand Turk (PA - all westerly beaches lie within Columbus Landfall Marine National Park)	Ei, poss. Cm, Cc	Fletemeyer 1983 (TCOT surveys found no nesting Sept 2002)
Gibbs Cay (PA - lies with Grand Turk Cays Land and Sea National Park)	Cm & poss. Ei	Fletemeyer 1982 (DECR confirmed 1 Cm nest Sept. 02)
Cotton Cay	Poss. Ei	Fletemeyer 1983 (TCOT interviews indicate nesting still occurs)
East Cay (PA - lies with Grand Turk Cays Land and Sea National Park)	Ei	Fletemeyer 1983 (TCOT interviews indicate nesting still occurs)
Salt Cay	Poss. Ei, Cm, Cc	Fletemeyer 1983 (TCOT interviews indicate occasional nests are encountered)
Big Sand Cay (PA - beaches lie within Big Sand Cay Sanctuary)	Ei, Cm	Fletemeyer 1983 (TCOT confirmed Cm nesting Sept. 2003)
South Caicos	Ei, poss. Cm, Cc	Fletemeyer 1983
Fish Cay (PA pending- recently leased to the TCI National Trust, Sanctuary status pending, R. Wild, pers. comm. 2003)	Ei, poss. Cm	Fletemeyer 1983 (TCOT confirmed Ei nesting Sept. 2003)
Big Ambergris Cay	Ei, poss. Cm	Fletemeyer 1983 (TCOT confirmed Ei nesting Jan. 2004)
Little Ambergris Cay (PA pending- recently leased to the TCI National Trust, Nature Reserve status pending, R. Wild, pers. comm. 2003)	Poss. Ei & Cm	Fletemeyer 1983 (TCOT interviews indicate nesting still occurs)
Bush Cay (PA - lies within French, Bush and Seal Cays Sanctuary)	Ei	Fletemeyer 1983 (DECR found 15 Ei nests on 9 th January 1992, TCOT found 3-4 nests, probably Ei, Sept. 2002)
French Cay (PA - lies within French, Bush and Seal Cays Sanctuary)	Ei, Cm, poss Cc	Fletemeyer 1983 (TCOT interviews indicate some nesting still occurs here, with some fishermen suggesting this is a nationally important rookery)
White Cay (PA - lies within French, Bush and Seal Cays Sanctuary)	Ei	Fletemeyer 1983 (TCOT interviews indicate nesting still occurs)
Lower Seal Cay (PA - lies within French, Bush and Seal Cays Sanctuary)	Unknown	TCOT interviews indicate some nesting still occurs here
West Sand Spit	Cm, poss. Cc, Ei	Fletemeyer 1983 (TCOT interviews indicate nesting still occurs)
Nurse Cay	Poss. Ei	Fletemeyer 1983
Sand Bars Cay	Poss. Ei, Cm	Fletemeyer 1983
Shot Cay (PA - lies within French, Bush and Seal Cays Sanctuary)	Ei, poss. Cm	Fletemeyer 1983

Table 9.2. Nesting activity indicated by Fletemeyer's 1982 surveys (and other sources, including TCOT, where indicated). NOTES: Location: PA – Protected Area. Species: Ei=hawksbill, Cm=green, Cc=loggerhead.

hawksbill and limited green turtle nesting still occurs in TCI, but found no evidence to support the claim that TCI supports a regionally important nesting population of loggerhead turtles. Fletemeyer (1983) suggests that the nesting season for all turtle species in the TCI extends from April to August inclusive. However, TCOT surveys confirmed that green and hawksbill turtles nest in September, and in January 1992, DECR found 15 hawksbill nests on Bush Cay. One TCOT SEQ interviewee who formerly collected turtle eggs claimed to have collected eggs from June to September, whereas 5 claimed they could collect them all year (see section 9.6.3). To understand the likely nesting season for green, hawksbill and possible loggerhead nesting populations in TCI, it is necessary to consider the nesting seasons of these species on nearby islands.

The loggerhead turtle nesting season in the Cayman Islands extends from May to August, green turtle nesting in the Bahamas occurs from June to September (in Hirth 1997), and in nearby Cuba, the hawksbill season extends from August to February, with peak nesting activity occurring between September and January (Moncada *et al.* 1999). Therefore, the likely composite marine turtle nesting season in the TCI is from May to January. TCOT uses this and individual species' nesting seasons to guide recommended legislative amendments with respect to the introduction of a closed season for turtle harvest at sea.

9.5.2. Genetics of nesting populations

No nesting green turtles or hatchlings were sampled in TCI during TCOT and only one hawksbill hatchling was sampled, from a recently emerged nest on Fish Cay in September 2002. TCOT genetic analysis of this sample has revealed a previously undescribed haplotype, provisionally entitled TCOT3. During TCOT genetic analyses, TCOT3 was also discovered in **foraging** hawksbill populations in Anguilla, BVI and Montserrat, as well as in nesting hawksbill populations in Anguilla and Montserrat (see section 10.4.4). Further sampling of TCI's nesting populations is urgently required to fully understand and establish their genetic identity.

9.5.3. Data from TCOT SEQ

Of the 92 TCOT SEQ interviewees, only 29 (31.5%) said that they had noticed trends in turtle nesting activity in TCI. Of these, only 7 (24.1%) said that green turtle nesting had increased and 2 (6.9%) said that hawksbill turtle nesting activity had increased in the last 5 years. One respondent said that green turtle nesting had decreased, 1 said that it had stayed the same, and this was mirrored by the responses to hawksbill nesting trends. Only 3 respondents answered the question specifically about loggerhead nesting, with 1 respondent each suggesting that nesting had increased, decreased and stayed the same in the last 5 years.

Nineteen (65.5%) of the 29 respondents who had noticed trends in turtle nesting activity in TCI in the last 5 years answered the question generally, and these present perhaps a more useful indication of perceived changes in nesting activity. Of these, 1 (5.3%) thought nesting

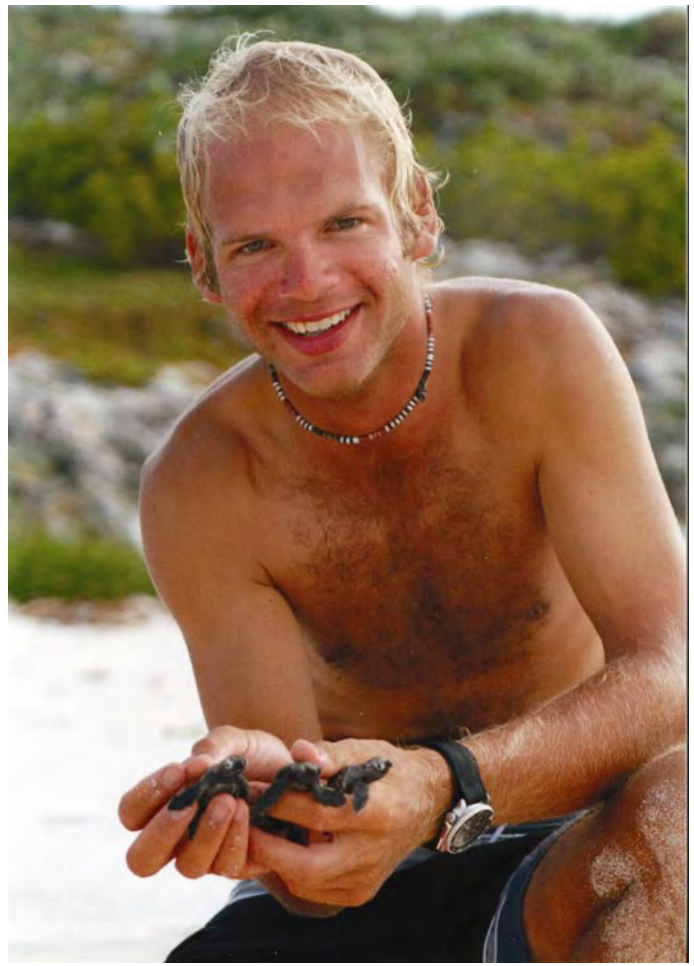


Photo 9.7. Duncan Vaughan (ex-DECR) on Fish Cay with hawksbill hatchlings from the only turtle nest sampled in TCI during TCOT (Photo S. Ranger).

activity had increased, 6 (31.6%) thought it had decreased and 8 (42.1%) thought it had remained the same. These respondents do not present a clear pattern of perceived change, and this may be because nesting now appears to be largely limited to remote cays that are not regularly visited by the majority of interviewees and therefore encounters with turtle nests are unusual. However, from these limited responses, there seems to be general perception that turtle nesting activity has either stayed the same or decreased in the last five years.

Species-specific responses to the question regarding perceived nesting trends since respondents could remember were similar and therefore as unclear as the species-specific responses described above. Of the 19 respondents who answered the question generally, 2 (10.5%) thought that nesting had increased, 12 (63.2%) thought that nesting had decreased and 5 (26.3%) thought that it had remained the same. Again, while these responses only give a limited impression of perceived changes, one can conclude that there is general perception that turtle nesting activity has decreased in TCI since people can remember.

9.5.4. Threats to TCI's nesting populations

The general perception of declining nesting activity in TCI may reflect real nesting population trends. The extensive take of nesting females and their eggs, prior to and since the introduction of the Fisheries Protection Regulations, 1976, are likely to have had serious adverse impacts on nesting populations. Several TCOT SEQ interviewees commented that the harvest of nesting females and their eggs was common practice on Salt Cay and Grand Turk earlier in the 20th Century, but TCOT surveys suggest that turtle nesting activity on these islands is now either absent or rare. Other interviewees noted that they had seen nesting activity on Grand Turk and on the west coast of Providenciales when they were younger, but not in recent years.

Egg collection and overfishing were identified by 3.2% (n=2) and 8.1% (n=5) respectively of the 62 TCOT SEQ interviewees who provided reasons for a perceived decrease in turtle populations in TCI. This suggests that the majority of interviewees do not perceive current or historical levels of harvest of turtles and their eggs in TCI as major threats. In contrast, tourist development of TCI was the most commonly identified reason for a decline in nesting activity, identified by 38.7% (n=24) of the 62 respondents who gave reasons for a decline of nesting and foraging populations. Development encompassed specifically identified adverse effects of light pollution, boat traffic, vehicle traffic behind the nesting beaches, disturbance on the nesting beaches and the toxic effects of suntan lotion in inshore waters.

Tourism is the main economy of the TCI, and has experienced accelerated growth since the international runway was built on Providenciales in 1986 (Gaudian & Medley 2000; Robinson & Fulford 1997). Since then, there has been significant pressure to develop beaches for tourism, especially in Providenciales, although significant tourist development has occurred on Grand Turk and lower levels of development has occurred on the other islands and some small cays. Sand for construction is often mined from the beaches (Gaudian & Medley 2000; Proctor & Fleming 1999; Robinson & Fulford, 1997). Despite development guidelines provided by the TCI Development Manual (Govt. of TCI 1996), which include a recommended setback of 60 feet from the high-tide line and preservation/rehabilitation of beach vegetation, developers routinely build permanent structures within the set-back threshold and clear beach vegetation for development projects. In many cases this has led to beach destabilisation and coastal erosion (Gaudian & Medley 2000; Robinson & Fulford 1997).

Insensitive tourism development certainly has the potential to impact turtle nesting beaches, and may well have done so in TCI. However, both Providenciales and Grand Turk have extensive stretches of undeveloped beaches lying within protected areas (see table 9.2), where, according to some TCOT SEQ interviewees, nesting females and their eggs were historically harvested and where nesting now appears to be absent. This suggests that extensive harvest at the nesting beaches has led to the demise of some rookeries within TCI.

Fortunately, the majority of the existing nesting beaches lie within the network of protected areas in TCI, where the erecting of any structure is prohibited unless authorised by the Director of Planning under the National Parks Ordinance, 1998 (see table 9.2). Notable exceptions that lie without the protected area network are Big Ambergris Cay and Highas Cay (immediately east of North Caicos) and Long Bay (East Caicos), cays that were consistently referred to as important turtle nesting sites during the TCOT SEQ. Big Ambergris Cay is privately owned and a large new hotel complex is currently under construction there (Anon 2002), whereas plans have been proposed to the TCI Government to develop East Caicos into a cruise liner port and tourist resort (Pienkowski 2002). This development is of particular concern as it would involve extensive and ecologically catastrophic development of the northern shore, reported to be the site of an important rookery, and part of the International Ramsar site, where development is prohibited unless authorised by the Director of Planning. These developments highlight the urgent need to identify TCI's marine turtle rookeries and protect those rookeries deemed nationally important.

Summary

In conclusion, knowledge of turtle nesting activity remains limited and this is of significant conservation concern for TCI's nesting marine turtle populations. Based on collated local knowledge, nesting populations in TCI have been extensively harvested and appear to have declined from the inhabited islands, with some nesting still occurring on remote cays and beaches. TCOT SEQ suggests that a significant percentage of the interviewees perceived development of beaches as a major reason for this decline, and that there is a relatively low level of awareness regarding the adverse impacts of egg and nesting female turtle harvest. This may explain why there has been relatively poor compliance with, and enforcement of, the national legislation that has prohibited these harvests since 1976. Tourism development may have impacted some nesting beaches in TCI, and certainly has the potential to impact on those rookeries located without TCI's network of protected areas.



Photo 9.8. Development immediately adjacent to a beach within Princess Alexandra National Park, Providenciales (Photo P. Richardson).

Recommendations

9.1.2.2. Amend Planning Policy and Beach Management

- a) Where possible, protected status should be extended to all nationally important nesting sites within TCI.
- b) Introduce planning regulations to mitigate the adverse impacts of development, including, for example light pollution, nesting female disturbance and erosion on all other nesting beaches.
- c) Where the extension of protected status to identified nesting beaches is not possible, TCOT recommends that TCI Government ensures, as a matter of priority, that any development occurring adjacent to important turtle rookeries is undertaken sensitively under the planning regulations mentioned above, to mitigate against disturbance and destruction of habitat.
- d) Under the guidance of the marine turtle conservation and management process, develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings (e.g. property lighting regimes).

9.1.3.1. Establish systematic monitoring efforts at index nesting beaches

- a) Seek funds for and establish a comprehensive survey of the beaches of TCI to identify key nesting sites. Ideally, this should involve aerial surveys carried out on at least a monthly basis from April to February inclusive, for three consecutive nesting seasons. These surveys should be followed up by ground truth surveys at sites that show the most nesting activity. Once these 'index' nesting sites have been identified, TCOT recommends that they are regularly monitored on foot (e.g. at least twice a month during the nesting season) to ascertain trends in nesting abundance. Surveys of index nesting sites undertaken in this way should also facilitate extensive genetic sampling to further establish the genetic identity of TCI's nesting turtle populations.

9.1.4.1. Encourage and implement sensitive practices at existing nesting beaches

- a) Develop a network of hoteliers, beach residents and other beach users to ensure swift reporting of nests not on index beaches, so that they can be marked, protected and monitored. This programme should encourage hoteliers to claim ownership of nest protection and encourage them and their guests to benefit from hatchling emergencies.

- b) Develop a network of interested beachfront residents and beach/sea users willing to report any turtle strandings and ensure DECR has the capacity to collect, necropsy and document all strandings.

- c) Raise awareness through a dedicated campaign to sensitise Islanders to the importance of protecting the nests of such small nesting populations, and to encourage reporting of any illegal take of eggs or nesting females.

- d) If nesting activity is detected on developed beaches, DECR should develop guidelines for beachfront property owners with respect to minimising adverse impacts on nesting turtles and hatchlings and distribute in the form of an accessible leaflet.

- e) Where possible, ensure school participation in any rookery monitoring programmes to sensitise children to importance of rookery protection.

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.

9.6. Status of Foraging Marine Turtles in TCI

TCI provides extensive foraging habitat for green and hawksbill turtles, while some foraging loggerhead turtles have also occasionally been reported (Carr *et al.* 1982; Fletemeyer 1983). Features of the TCI landscape bear testament to the presence of foraging turtles, with Turtle Pond, Turtle Creek and Turtle Cove found on Providenciales alone. Fletemeyer encountered large numbers of green turtles foraging on the seagrass beds immediately south of North, Middle and East Caicos, as well as in the tidal creeks that permeate the southern shores of these islands. Fletemeyer's stomach content analysis of harvested green turtles from these creeks indicates that they are foraging primarily on seagrass (*Thalassia testudinata*). Green turtles were also recorded feeding on sea grass beds at Highas Cay and Bottle Creek on the north shore of North Caicos. At Bottle Creek, Fletemeyer (1983) captured 9 foraging juvenile green turtles ranging from 26.5cm to 45cm CCL (mean±SD = 40.3cm ± 6.7cm) and 1 foraging sub-adult green turtle (71cm CCL) during his 1982 surveys. Fletemeyer also encountered large numbers of hawksbill turtles of different sizes on TCI's shallow and deepwater fringe and patch reefs, as well as one juvenile on a seagrass bed and several juveniles at Ocean Hole. Ocean Hole is a 1km wide, deep-water submerged hole in the limestone platform on the Caicos Bank immediately south of Middle Caicos.

Location	Species	Source
West Caicos (PA – West Caicos Marine National Park)	Ei, Cm	Slade, 2004 (Caribbean Turtlewatch)
Providenciales – North West Point (PA – North West Point Marine National Park)	Ei, Cm	Slade, 2004 (Caribbean Turtlewatch)
Providenciales – various sites in Princess Alexandra Land and Sea National Park (PA)	Ei, Cm	Presence of Ei & Cm confirmed by TCOT surveys Sept. 2002. Slade, 2004 (Caribbean Turtlewatch)
Providenciales – Blue Hills	Cm	Fletemeyer, 1983
Providenciales – Silly Creek	Cm	Presence of Cm confirmed by TCOT surveys Sept. 2002
Little Water Cay (PA – lies within Princess Alexandra Land and Sea National Park)	Cm	Fletemeyer, 1983 (TCOT SEQ indicated large foraging turtle populations here)
Pine Cay	Ei	Fletemeyer, 1983 (TCOT SEQ indicated large foraging turtle populations here)
Parrot Cay	Unidentified	Fletemeyer, 1983 (TCOT SEQ indicated large foraging turtle populations here)
Southern coast & creeks of North, Middle and East Caicos (PA - Ramsar Site)	Ei, Cm	Fletemeyer 1983 (Presence of Ei & Cm confirmed by TCOT surveys Sept. 2002)
Ocean Hole (PA – lies within Vine Point and Ocean Hole Nature Reserve)	Ei, Cm	Carr et al, 1981, Fletemeyer 1983 (presence of Cm confirmed by TCOT surveys Sept. 2002)
Bottle Creek	Cm	Fletemeyer 1983 (TCOT SEQ indicated large foraging turtle populations here)
Highas Cay	Ei, Cm	Fletemeyer 1983 (TCOT SEQ indicated large foraging turtle populations here)
Windward Passage Going Through (PA - lies within the International Ramsar site)	Cm, Ei	TCOT SEQ indicated large foraging turtle populations
Bell Sound, South Caicos (PA – lies within Bell Sound Nature Reserve)	Ei	Presence of Ei confirmed by TCOT sampling Sept. 2002
Six Hills Cay (PA – lies within Admiral Cockburn Nature Reserve)	Ei	Presence of Ei confirmed by TCOT sampling Sept. 2002
Long Cay (PA – lies within Admiral Cockburn Nature Reserve)	Ei	Presence of Ei confirmed by TCOT sampling Sept. 2002
Middleton Cay (PA – lies within Admiral Cockburn Nature Reserve)	Ei	Presence of Ei confirmed by TCOT sampling Sept. 2002
Big Ambergris Cay	Ei, Cm	Fletemeyer 1983 (Presence of Ei confirmed by TCOT surveys Sept. 2002)
Little Ambergris Cay (PA pending– leased to the National Trust, Nature Reserve status pending, R Wild pers. comm., 2003)	Ei, Cm	Fletemeyer 1983 (Presence of Ei confirmed by TCOT sampling Sept. 2002)
Fish Cay (PA pending– leased to the National Trust, Sanctuary status pending, R Wild pers. comm., 2003)	Ei, Cm	Fletemeyer 1983 (Presence of Ei confirmed by TCOT surveys Sept. 2002)
Bush Cay (PA – lies within French, Bush and Seal Cays Sanctuary)	Ei	Presence of Ei confirmed by TCOT sampling Sept. 2002
Grand Turk (PA – extensive foraging habitat lies within Columbus Landfall Marine National Park, Grand Turk Cays Land and Sea National Park and South Creek National Park)	Ei, Cm	Fletemeyer 1983
Gibbs Cay (PA – lies within Grand Turk Cays Land and Sea National Park)	Ei, Cm	Fletemeyer 1983
Cotton Cay	Ei, Cm	Fletemeyer 1983
East Cay (PA – lies within Grand Turk Cays Land and Sea National Park)	Ei, Cm	Fletemeyer 1983
Salt Cay	Ei, Cm	Fletemeyer, 1983, Groombridge & Luxmore, 1989 in Proctor & Fleming, 1999
Big Sand Cay (PA – lies within Big Sand Cay Sanctuary)	Cm	Presence confirmed by TCOT surveys Sept. 2002
Pear Cay (PA – lies within French, Bush and Seal Cays Sanctuary)	Ei	Presence confirmed by TCOT sampling Oct. 2002
French Cay (PA – lies within French, Bush and Seal Cays Sanctuary)	Ei, Cm	Slade, 2004 (Caribbean Turtlewatch)

Table 9.3. Marine turtle foraging areas in TCI as identified by Fletemeyer's 1982 surveys and other sources. NOTES: Location: PA – Protected Area. Species: Ei=hawksbill, Cm=green, Cc= loggerhead.

Local fishers also describe a 'mulatto' turtle, although Carr *et al.* (1982) and Fletemeyer (1983) suggest that this may be a local name for the loggerhead turtle, despite some fishers clearly identifying loggerhead turtle as a distinct and separate species. Fletemeyer does not discount that 'mulatto' turtles may in fact be ridley turtles (*Lepidochelys* spp.), but did not record either olive ridleys or Kemp's ridleys during his surveys. Table 9.3 shows sites where foraging green and hawksbill turtles were encountered during Fletemeyer's 1982 survey, as well as records from other sources, including TCOT and associated programmes.

9.6.1. Monitoring efforts

Little or no long-term monitoring of TCI's foraging marine turtle populations has been carried out, and therefore trends in abundance of these populations are unknown. Fleming (2001) reports that a dive operator on Grand Turk buys turtles from fishers and has tagged and released nearly 300 turtles in the last few years. TCOT staff were unable to access this operator's records and therefore the results of this effort are unclear.



Photo 9.9. A juvenile green turtle swims over sea grass beds at Bight Reef, Princess Alexandra National Park (Photo P. Richardson).



Photo 9.10. Jasmine Parker takes a genetic sample from a juvenile green turtle caught within the Ramsar site (Photo P. Richardson).

During the TCOT project in TCI, systematic surveying of index foraging sites was implemented (with advice from TCOT) by Lorna Slade at Bight Reef (40 visits), Smith's Reef (13 visits), Turtle Gardens (18 visits), Turquoise Reef (14 visits) and Table Top (11 visits), all within the boundaries of the Princess Alexandra National Park along the north shores of Providenciales (Slade in press). The sites were similar, each consisting of an area of patch reef adjacent to a seagrass bed. Sites were visited between February 2002 and February 2004 before 13:00hrs and snorkel surveys were carried out for 30 minutes at relatively consistent speeds. Any turtles encountered were identified and an estimate of Straight Carapace Length (SCL) was noted, as was the turtles' behaviour and various environmental factors such as weather and visibility. Juvenile green (30cm to 66cm SCL) and hawksbill (25cm to 51cm SCL) turtles were encountered at all sites except Table Top where no turtles were encountered. These surveys indicate that Princess Alexandra National Park provides foraging habitat for juvenile green and hawksbill turtles, and they will be fully reported in time by Lorna Slade and her TCOT collaborators. No other systematic surveying of index sites was implemented under TCOT.

Slade (in press) also coordinated Caribbean Turtlewatch in TCI. Dive Provo and Flamingo Divers regularly completed Caribbean Turtlewatch datasheets, resulting in 318 and 118 recorded turtle sightings respectively. Dives were conducted at fringe reef sites off West Caicos, French Cay, North West Point (Providenciales), Princess Alexandra National Park (Providenciales) and South West Reef (Providenciales), with green and hawksbill turtles seen at all sites except South West Reef, where no turtles were encountered during the survey period. Hawksbill turtles were the most commonly encountered species (83.4% of sightings), including individuals with estimated SCL's of between 23cm and 122cm. It is of interest that the next most commonly encountered species was the 'mulatto', constituting 4.7% of sightings (n=20) including individuals with estimated SCL's of between 31cm to 91cm.

When asked to identify this species on the WIDECAST photographic turtle ID chart, dive operators consistently indicated that they were seeing Kemp's ridley turtles. TCI Caribbean Turtle watch data included 13 loggerhead sightings (3.1% of sightings) including individuals with SCL's between 61cm and 122cm, 12 green turtle sightings (2.8% of sightings) including individuals with estimated SCL's of between 40cm and 91cm, while 23 sightings were unidentified (5.5%). Preliminary analysis of the TCI Caribbean Turtlewatch data therefore suggests that TCI's fringing reefs provide foraging habitat for juvenile, sub-adult and adult hawksbill turtles, with similar size classes being represented on the fringing reefs within smaller populations of green and loggerhead turtles. TCI's fringing reefs may also support a small foraging population of Kemp's Ridleys, although their presence in TCI has not yet been corroborated.

9.6.1.1. TCOT genetic sampling and tagging

Green and hawksbill turtles were captured by TCOT staff, DECR or accompanying fishers during sampling trips to the International Ramsar site, South Caicos, Middle Caicos and some of the cays south of South Caicos (see below). Turtles were tagged, sampled and biometric measurements were taken on board the boats used and turtles were returned to the water where they were caught. However, most of the turtles sampled were captured opportunistically by South Caicos fishers during normal fishing activity and brought to South Caicos where they were tagged, sampled and measured by DECR officers (see below).

Morphometric data: Straight carapace length, width and plastron length measurements are recorded for turtles on capture and following each recapture.

Genetic Sampling: Skin biopsies are obtained from a rear flipper with a sterile 4-millimetre biopsy punch or scalpel and preserved in a buffer solution of 20% dimethyl sulfoxide (DMSO) saturated with Sodium Chloride (NaCl) (Dutton 1996).

Tagging: All captured turtles are tagged according to standard protocols to prevent collection of duplicate genetic samples and to elucidate demographic parameters. Metal Inconel tags are applied to the posterior edge of each front flipper and Passive Integrated Transponder (PIT) tags are injected into the shoulder muscle (Balazs 1999).

During scoping surveys, TCOT staff observed foraging juvenile green turtles in the Silly Creek, south Providenciales in September 2002. TCOT genetic sampling confirmed that the sea grass beds and tidal creeks associated with the International Ramsar Site on the southern shores of North, Middle and East Caicos provide extensive foraging habitat to a significant population of juvenile and sub-adult green turtles. TCOT sampled within the Ramsar site because accompanying fishers suggested that the site encompasses the best turtling grounds in the archipelago. Fifteen (88.2%) of the 17 green turtles captured for TCOT sampling were caught on the sea grass beds within the Ramsar site during three sampling trips, while the other two were caught off South Caicos and at Six Hills Cay (see Table 9.4, Mean CCL(cm) $\pm$ SD; 51.5 $\pm$ 7.8). In addition, TCOT staff witnessed the landing of an adult green turtle (CCL=103.5cm) at Cockburn Harbour, South Caicos by a local turtle fisher on the 4th September 2002. He had found it resting at the base of a coral head in patch reef at Six Hill Cay and he and his crew had hauled it aboard with lobster hooks. When butchered, the animal yielded many developing eggs and had a gut packed with freshly ingested seagrass. The lower intestine was impacted with a blockage consisting of plastic bags, burlap packaging, copper wire and plastic drinks containers. This turtle was probably captured during an inter-nesting interval and may have been part of TCI's green turtle nesting population. Six Hill Cay lies within the Admiral Cockburn Nature Reserve and as such fishing is prohibited within the Reserve boundaries.

Samples were also taken from 41 live captured hawksbill turtles and one suspected hawksbill/loggerhead hybrid (see table 9.4 - Mean CCL (cm) $\pm$ SD; 40.9 $\pm$ 10.2). The hawksbills were either caught and sampled by TCOT (n=2) or the DECR (n=9), were landed by fishers for butchery (n=4), or were landed by fishers for the DECR to sample (n=26). This cooperation was facilitated by Amber Thomas, former DECR Conservation Officer at South Caicos, who issued a request to some South Caicos fishers that they opportunistically catch and land any turtles they encounter



Photo 9.11. DECR officers worked with South Caicos fishermen during TCOT sampling (Photo P. Richardson).



Photo 9.12. An adult female green turtle landed at South Caicos in September 2002 (Photo P. Richardson).



Photo 9.13. Gut contents of a butchered adult female green turtle, showing ingested marine litter (Photo P. Richardson).

while undertaking their normal fishing, usually for other target species such as lobster (A Thomas (DECR) pers. comm. 2002). From September to December 2002, 6 South Caicos fishers caught and landed 26 hawksbill turtles and 2 green turtles for the DECR to sample, tag and release, while 4 hawksbills landed for butchering were also sampled. The butchered hawksbills had CCL's of 47cm, 48cm, 58cm and 80cm respectively and were therefore larger than the mean hawksbill landed for TCOT to tag and release. It is worth noting that these butchered turtles do not represent the total number of turtles landed for use in the described period, as most fishers would not bring green turtles to the DECR for sampling, rather they would take them directly to Providenciales for sale (A. Thomas (DECR) pers. comm. 2003).

Fibropapillomatosis (FP) is a widespread and sometimes fatal epizootic disease that is commonly associated with green turtles, but has also been pathologically confirmed to occur in populations of hawksbill, leatherback, loggerhead and olive ridley turtles and has been reported in Kemp's ridley and flatback turtles (Aguirre 1998; Aguirre *et al.* 2000, Barragan & Sarti 1994; D'Amato & Moraes-Neto 2000; Herbst 1994; Huerta *et al.* 2002; Jacobsen *et al.* 1989). FP has been recorded in turtle populations around the world, including green turtle populations in the Cayman Islands and both the British and US Virgin Islands (Eliziar *et al.* 2000; Overing 1996; Wood & Wood 1993). Seven (41.2%) of the 17 juvenile green turtles captured for TCOT genetic sampling exhibited FP like growths (see table 9.4). Biopsies of the growths were taken and will be examined in the UK and described in later publications. In addition, during TCOT SEQ, a recreational bonefish angler reported the accidental capture, on rod and line, of a sub-adult hawksbill turtle in the tidal creeks of the Caicos Islands, which apparently also exhibited FP-like growths on the head and flippers. Conversations with TCI fishers have revealed that FP-like symptoms are locally referred to as 'old turtle disease'.

Species	Mean CCL (cm) ± SD (range)	Capture location	Caught by
Green (n=17)	51.5 ± 7.8 (38.3-64.8)	International Ramsar site	Fisherman (n=2) & TCOT (n=15) for TCOT all turtles tagged & released; FP=7)
Green (n=1)	103.5	Six Hills Cay	Fishermen (butchered for sale)
Hawksbill/ loggerhead hybrid(n=1)	43.3	Unknown	Fisherman (tagged & released)
Hawksbill n=41)	40.9 ± 10.2 (22.9-80)	South Caicos (n=4), Middleton Cay (n=1), Big Ambergris Cay (n=4), Six Hills Cay (n=11), Bell Sound (n=3), International Ramsar site (n=3), Bush Cay (n=1), Long Cay (n=1), Iguana Cay, Middle Caicos (n=1) , Fish Cay (n=3), Long Cay (n=1), Pear Cay (n=1), Unknown (n=6)	Fishermen (n=30), DECR (n=9), TCOT (n=2) (All tagged & released except 4 that were butchered)

Table 9.4. Live captured turtles genetically sampled during TCOT (FP= indicates presence of fibropapilloma-like growths).



Photo 9.14. A South Caicos fisher with green and hawksbill turtles caught during TCOT sampling within the Ramsar site (Photo P. Richardson).

9.6.2. Genetics of foraging populations

TCOT genetic analyses have shown that the haplotypes of foraging turtles in TCI have also been described in a number of other nesting and foraging sites (see section 10.4.4).

Foraging green turtles in TCI: Haplotypes described in the 17 samples that generated data during TCOT genetic analysis (1 sample failed) have also been described in **foraging** populations in Anguilla (via TCOT), Bahamas, Barbados, BVI (via TCOT), Florida, Montserrat (via TCOT), Nicaragua and West Africa. Some of these haplotypes have also been described in **nesting** populations in Ascension Island, Aves Island, Brazil, Costa Rica, Florida, Mexico, and Suriname, as well as Bioko, Guinea Bissau, and Sao Tome and Principe on the west coast of Africa.

Foraging hawksbill turtles in TCI: Haplotypes described in the 38 samples that generated data during TCOT genetic analysis (8 samples failed) have also been described in **foraging** populations in Anguilla (via TCOT), BVI (via TCOT), Cayman Islands (via TCOT), Cuba, Montserrat (via TCOT) and Puerto Rico. Some of these haplotypes have also been described in **nesting** populations in Anguilla (via TCOT) Antigua, Barbados, Belize, Brazil, Cuba, Mexico, Montserrat (via TCOT), Puerto Rico and the US Virgin Islands.

It should be noted, however, that these are only potential linkages as haplotypes are not unique to individual nesting colonies. Complex mathematical analyses will be run on full sample sets following the next batch of analyses during 2005 and more definitive answers will be available then. At this point, however, it can be clearly highlighted that the turtles foraging in TCI waters will undoubtedly include those originating from a number of nesting colonies across the Caribbean region. Detailed information will be disseminated as part of the cross-territory FCO Overseas Territories Environment Programme (OTEP) funded project, which will focus on Turtle Conservation and the Environment Charter and Multilateral Environment Agreements. However, further sampling of TCI's foraging turtle populations is required to fully understand and establish their genetic identity.

9.6.3. Threats to TCI's foraging turtle populations

Illegal fishing within TCI's network of protected areas may be considered a threat to foraging populations of marine turtles, as these areas have been established as refuges for TCI's wildlife, including marine turtles (Gaudian & Medley 2000). It is worthy of note that of the 30 hawksbills captured by fishers as described in section 9.6.1, 50% (n=15) were caught in the protected areas of Six Hills Cay (n=9), the International Ramsar site (n=1), Bell Sound, South Caicos (n=1), Long Cay (n=1), Middleton Cay (n=1), Bush Cay (n=1) and Pear Cay (n=1), where fishing is prohibited under the National Parks Ordinance, 1998. The hawksbill captured at Pear Cay in October 2002, was an adult female (CCL=80cm) and was one of those butchered for sale.

This reinforces some TCOT SEQ interviewee claims that illegal fishing occurs in several of the protected areas (see section 9.7.1), particularly those away from population centres where enforcement is non-existent (Gaudian & Medley 2000). These sites, as well as the others listed in tables 9.3 and 9.4, provide extensive foraging habitat for what is probably a large population of green and hawksbill turtles in TCI's waters.



Photo 9.15. Fibropapilloma-like growths on juvenile green turtle caught within the Ramsar site (Photo P. Richardson).

During TCOT SEQ, several interviewees claimed that migrant fishers from the Dominican Republic and Haiti were illegally fishing for turtles and other species in TCI's waters (see section 9.7.1), but TCOT was unable to validate or quantify the extent of this harvest (see section 9.6.4). Indeed, the current legal turtle harvest may also pose a threat to TCI's foraging turtles, but as there are no programmes to monitor the turtle fishery or trends in turtle population abundance, it is currently impossible to determine the impacts of this harvest of TCI's turtles.

There are few other threats to TCI's foraging turtles. Proctor & Fleming (1999) report that TCI reefs show little sign of being deleteriously affected by human activity, while Gaudian and Medley (1995; in Gaudian & Medley 2000) showed that there was small but measurable diver impacts on reef benthos. However, there are concerns that inadequate sewage disposal facilities at recent tourism developments may lead to inshore water contamination (Robinson & Fulford 1997), and in May 2002, TCOT staff witnessed juvenile green turtles swimming amongst significant sewage pollution at Turtle Cove, which lies in the Princess Alexandra National Park. Extensive and prolonged sewage effluent can significantly and adversely affect coral reef and seagrass bed ecosystems (Gibson & Smith 1999). The sewage and hyper-saline water discharge pollution in Turtle Cove is currently being addressed by the Planning Department, Environmental Health Department and DECR (B. Riggs (DECR) pers. comm. 2004).



Photo 9.16. Raw sewage pollution at Turtle Cove marina in May 2002 (Photo P. Richardson).

In addition, Slade reports that pleasure boats have been known to collide with turtles in the Princess Alexandra National Park, although the significance of this as a threat to TCI's foraging turtle populations is unclear (L. Slade pers. comm. 2004). Cruise liners are currently received at Grand Turk, and the cruise liner industry is a recognised source of pollution and damage to marine turtle habitats (Klein 2002; NMFS 1993). In Puerto Rico and the USVI, cruise liners have run aground or anchored on coral reefs causing extensive damage to the reefs and in some cases turtle nesting beaches (NMFS 1993), and the potential exists for similar local damage to turtle foraging habitat to occur in TCI as a result of increased cruise liner traffic.

9.6.4. Data from TCOT SEQ

Of the 92 TCOT SEQ interviewees, 62 (67.4%) said that they had noticed trends in numbers of turtles at sea (as opposed to not noticing or not answering the question, n=30).

Of these, 36 interviewees gave non-species-specific (general) answers about trends in turtles at sea in the last 5 years, while 26 gave species specific answers about green and hawksbill turtles. Of these 26, 10 thought that green turtle populations had increased in the last 5 years, 6 thought they had decreased, 9 thought numbers had stayed the same and 1 did not know. Therefore 73.1% of interviewees who noticed species-specific trends suggested that green turtle populations had increased or stayed the same in the last 5 years. Ten of these 26 thought that hawksbill populations had increased in the last 5 years, whereas 4 thought they had decreased, 5 thought they had remained the same, 1 did not know and 6 did not answer this question for hawksbills. Therefore 57.7% who noticed species-specific trends suggested that hawksbill populations had increased or stayed the same in the last 5 years. Only one interviewee, a recreational fishing boat charter owner, gave an answer about leatherbacks, suggesting they had decreased in the last 5 years and only 6 interviewees answered about loggerheads, with equal numbers (n=2) suggesting that populations had increased, decreased and stayed the same.

Of the 36 that answered these questions generally, 11 (30.6%) thought that turtle populations had increased at sea in the last 5 years, 13 (36.1%) thought that turtle numbers had decreased and 10 (27.8%) thought numbers had stayed the same. Two (5.6%) did not know about turtle trends in the last 5 years. Therefore, only 36.1% of those interviewees who gave answers about general trends in turtle numbers thought that populations had decreased in the last five years, whereas 58.4% suggested that populations had increased or stayed the same. Responses to TCOT SEQ therefore suggest that turtles in TCI's waters have either stayed the same or increased in the last 5 years.

The same 62 respondents who noticed trends in turtle populations in the last 5 years also noticed trends in turtle populations since they could remember, and the answers of 36 of these respondents were general. Of

the 26 interviewees that noticed species-specific trends in abundance, 11 suggested green turtle populations had increased since they could remember, 6 said that populations had decreased, 7 said that populations had stayed the same and 2 did not know. Therefore 69.2% (n=18) of interviewees giving species specific responses suggested that green turtle populations had either increased or stayed the same since they could remember. Similarly, 11 respondents suggested that hawksbill populations had increased since they could remember, 4 suggested that they had decreased, 3 suggested they had stayed the same, 2 did not know and 6 did not answer this question. Therefore, 53.8% (n=14) of these respondents thought that the TCI hawksbill population had increased or stayed the same as far as they could remember.

The 36 respondents who answered this question generally mirrored the species-specific answers, with 11 (30.6%) respondents suggesting that turtle populations had increased since they could remember, 13 (36.1%) suggesting they had decreased, 10 (27.8%) suggesting that they had stayed the same while 2 (5.6%) respondents did not know. Therefore 58.4% (n=21) of these respondents thought that turtle populations had increased or stayed the same since they could remember, while 36.1% suggested they had decreased. Again, the majority of TCOT SEQ respondents who noticed trends in turtle abundance suggest that TCI foraging turtle populations are the same or have increased since they can remember.

It is interesting to note that when the current and former turtle fishers' answers to these questions are isolated from other TCOT SEQ interviewees, the results are similar. Nineteen current and former fishers (52.8% of all 36 respondents who answered generally) answered these questions, of which 5 suggested that turtle numbers had increased in the last five years, 6 suggested that had decreased and 7 suggested that they had stayed the same, while 1 respondent did not know. Therefore 63.2% (n=12) of these 19 fishers thought that turtle populations were the same or had increased in the last 5 years, while 31.6% (n=6) thought that numbers had decreased. These same fishers answered generally about turtle trends at sea since they could remember and 5 suggested that numbers had increased, 7 suggested that numbers had decreased and 6 suggested that populations were the same, with 1 who did not know. Therefore 57.9% (n=11) of these 19 fishers believed that turtle numbers had increased or were the same since they could remember, while 36.8% thought populations had decreased (n=7).

When the dive operator, recreational fishing boat charter and boat trip operator responses are isolated, 6 interviewees gave opinions about general trends in turtle numbers at sea. Three of these respondents suggested that TCI's turtle populations had increased in the last 5 years, whereas 3 said they had stayed the same. Three of these respondents suggested that turtle populations had increased since they could remember, 1 said that they had decreased and 2 suggested that they had remained the same.

The 62 TCOT SEQ interviewees who noticed trends in TCI's foraging turtle populations only offered 4 reasons for the perceived increases in numbers. Nineteen (30.6%) suggested that decreased catch was responsible for population increase, 4 suggested that decreased egg collection was responsible, 1 respondent suggested that the National Parks were the reason and 1 suggested that the populations were undergoing a natural increase.

This perceived stability/increase in TCI's populations of foraging turtles may well reflect real population trends due to factors at play way beyond the boundaries of TCI's territorial waters. Previous studies have shown that Caribbean hawksbill and green turtle foraging aggregations are typically comprised of individuals originating from a diversity of regional nesting populations (Bass & Witzell 2000; Diaz-Fernandez *et al.* 1999; Luke *et al.* 2004). Preliminary analysis of TCOT genetic samples indicates that the foraging turtle populations found in the waters of the UK Overseas Territories in the Caribbean are also likely to comprise of mixed stocks (see section 10). While the exact nature of the genetic stock composition of these populations cannot yet be determined by data generated from the relatively low sample sizes collected during TCOT, a review of previous analyses of nearby foraging populations may provide some indication of the possible stock composition of TCI's foraging turtles. For example, Bass & Witzell (2000) analysed the mtDNA of the juvenile green turtle population foraging of the east central Florida coast. Their results suggested that this population is comprised of individuals originating from nesting beaches in Costa Rica (53%), USA and Mexico (42%), as well from Aves Island (Venezuela) and Suriname (4%). A similar study of juvenile green turtles foraging in the Bahamas territorial waters suggested contributions from Costa Rica (80%), United States and Mexico (5%), Aves Island and Suriname (14%), as well as Ascension Island and Guinea Bissau (1%) (in Bass & Witzell 2000). TCOT genetic analysis has identified haplotypes in TCI's green turtle population that are shared with nesting populations in Ascension Island, Aves Island, Brazil, Costa Rica, Florida, Mexico, and Suriname, as well as some West African nesting populations. The large nesting populations at Ascension, Tortuguero (Costa Rica), Yucatan Peninsula (Mexico) and Florida appear to be stable or increasing as a result of rigorous and prolonged conservation measures at the nesting beaches (Bjorndal *et al.* 1999; Godley *et al.* 2001; Seminoff 2004; Troeng & Rankin in press). However, the green turtle population nesting on Venezuela's Aves Island, the second largest green turtle rookery in the Wider Caribbean Region after Tortuguero, appears to have experienced a 90-98% decline over 3 generations (ca 130 years) (Seminoff 2004). Nevertheless, if the large, stable or increasing green turtle nesting populations in the Wider Caribbean are making a significant contribution to TCI's foraging green turtle populations, then extensive or increased production of hatchlings from these nesting beaches may well result in increased recruitment into the TCI foraging population.

Similarly, while Meylan (1999) found hawksbill populations in the Caribbean region to be declining or severely depleted in 22 of 26 countries and territories where data were available, the protected and monitored nesting populations of Barbados, Doce Leguas Cay (Cuba), Mona Island (Puerto Rico, USA) and Yucatan (Mexico) appear to be increasing (Meylan 1999; IUCN 2002). Hawksbill populations nesting at Buck Island (USVI), Jumby Bay, Antigua and Tortuguero in Costa Rica appear to be stable (IUCN 2002). TCOT genetic analysis has identified haplotypes in the TCI foraging hawksbill population that are shared with nesting populations in Anguilla, Antigua, Barbados, Belize, Brazil, Cuba, Mexico, Montserrat, Puerto Rico and the US Virgin Islands. As with the green turtle foraging populations, if these large, increasing or stable regional nesting populations make significant contributions to TCI's foraging hawksbill population, then extensive and increased production of hatchlings at these nesting beaches may result in increased recruitment into TCI's foraging populations.

Summary

In conclusion, despite extensive historical and contemporary harvest of marine turtles in TCI's waters, TCOT SEQ indicates that local foraging turtle populations, largely consisting of green and hawksbill turtles, have remained stable, or possibly increased since most of the interviewees can remember as well as in the last 5 years. TCOT staff observations suggest that both green and hawksbill turtles are abundant in TCI's waters and that patch and fringing reef, tidal creek and seagrass bed habitat within TCI's waters may be of regional importance to both green and hawksbill turtles. TCOT believes that the International Ramsar Site is of particular importance to regional green turtle populations.

Recommendations

9.1.3.2. Establish systematic monitoring efforts at index foraging sites

- a) *Seek funds for and establish a systematic aerial survey of TCI's waters to understand the current distribution of turtles and identify index foraging sites. Through these surveys, index foraging sites should be identified, and frequently (e.g. once per month) and systematically monitored via boat/snorkel surveys or CPUE sampling to assess trends in abundance of TCI's foraging turtle populations.*
- b) *Expand the sampling regime initiated under TCOT to establish the genetic 'identity' of TCI's nesting and foraging populations. This sampling could be included as part of the surveys mentioned above. The participation of turtle fishers should be encouraged where practicable. Sampling should be extensive and should include an assessment of the prevalence of fibropapilloma (FP) in the foraging, and if possible, nesting turtle populations.*

c) Caribbean Turtlewatch has the potential to monitor certain regularly used dive sites for presence and absence of turtles, but requires dedicated staff time to liaise with willing dive operators, and treat data generated through the programme. TCOT recommends that if resources allow, DECR/ PAD continue and maintain Caribbean Turtlewatch with current participating dive operators in Providenciales as a relatively cheap method of monitoring turtle abundance at index foraging sites.

9.7. Direct Use of Marine Turtles in TCI (20th Century and beyond)

In 1907 the Government passed the TCI's first Turtle Protection Ordinance, aimed primarily at preventing illegal turtle take by Bahamians. In 1910, the Caicos Development Company leased the Chalk Sound lagoon to a Mr George Silly for raising and canning turtles, lobsters and other shellfish. The cannery continued to operate until the Second World War, which led to a shortage of tin plate, but apparently the cannery's trade in turtle meat had 'tapered to nil' by 1930. TCI continued to export turtle shell thereafter with £343 worth exported in 1929, with various similar amounts exported up until 1933, when only £150 worth was exported in 1933 at the onset of the Depression, which devastated the island's economy (Sadler 1997). The reasons for the decline in commercial trade of turtles from TCI are unclear, although declining turtle populations and a decline in demand have been suggested (Fletemeyer 1983), and the Depression is likely to have significantly affected foreign demand for luxury delicacies such as turtle meat. In 1941, the Fisheries Protection Ordinance was created to provide a framework to regulate all of TCI's fisheries, and these were revised in 1976 with special provisions for the turtle fishery (see below - Fleming 2001).

Throughout the 20th Century, turtles continued to be fished for domestic consumption, and eggs were also harvested for sale, especially on South Caicos and Salt Cay (Fleming 2001). A popular early 20th Century TCI calypso regularly performed by South Caicos ripsaw bands is titled 'I Dig There' and recounts how two well known South Caicos men were out collecting turtle eggs one night when one steals the eggs found by another (Bowen 2002). The chorus reads:

*'I dig there
Garland dig there
Garland push his finger in my hole
In my hole, in my hole
Garland push his finger in my hole'.*

In 1970, Dr Robert Schroeder of Mariculture Ltd (now the Cayman Turtle Farm) visited TCI with a view to establishing another turtle farm, but apparently nothing resulted from his visit (Sadler 1997). In 1976, the Government of TCI introduced the Fisheries Protection Regulations that for

the first time prohibited the collection of turtle eggs and protected nesting female turtles on the beach (Proctor & Fleming 1999). Domestic harvest of turtles at sea continued in the late 1970's, when Meylan (in Carr *et al.* 1982) reported that no commercial harvest of turtles occurred, but juvenile green and hawksbill turtles were chased down in boats and captured 'partly for sport and partly for consumption'. Meylan did not notice any tourist trade in turtle products, and while she did not visit the main tourist island of Providenciales, there was only low-level tourism in TCI at the time. Riggs (DECR pers. comm. 2004) suggests that since the 1970s there has not been a significant trade in turtle shell products to tourists visiting TCI, although Meylan notes that 'insignificant' trade in hawksbill scutes occurred between local fishers and Haitian buyers (Carr *et al.* 1982).

From a survey carried out in 1981, and contrary to Meylan's finding 2 years earlier, Fletemeyer (1983) estimated that the annual commercial harvest of turtles in TCI stood at about 850 animals, consisting mostly of juvenile green turtles weighing between 2 and 8kgs, with some juvenile and adult hawksbill opportunistically taken during the lobster fishing season. Fletemeyer estimates that about 70 to 90 fishers harvested turtles, most of whom were targeting other species, but would take turtles opportunistically. He also reported that turtle meat was found year round, but sporadically, in TCI's markets, and all was consumed locally. Turtle meat sold at US\$1/lb live weight or US\$1.90 to US\$2.50/lb for butchered meat. Shell was sold at between US\$10 to US\$20/lb and eggs were sold at 50 for US\$1. In addition to the commercial sale of meat, Fletemeyer estimated subsistence takes of 8,000 to 10,000 turtle eggs, 20 to 30 nesting females and between 200 to 400 turtles at sea. On the basis of his findings, Fletemeyer states that '*Fishing pressure at this level does not seem to pose a serious threat to the survival of the sea turtle population in the waters off the Turks and Caicos Islands*'.

Fletemeyer's (1983) reports of egg harvest and sale, as well as harvest of nesting females, are interesting because these takes would have been in direct contravention of the Fisheries Protection Regulations, 1976. He states that at the time there was '*virtually no legal enforcement*' of the regulations, and 2 years earlier Meylan (in Carr *et al.* 1982) concurs, stating that enforcement of the regulations by the authorities was '*probably inadequate*'. Rudd (2003) writes about the recent history of TCI's fisheries and states that compliance with fishery regulations has been poor since the 1960's. This was exacerbated by the rampant drug trafficking through TCI in 1980's, especially South Caicos, the main fishing centre of TCI, which '*encouraged a culture of distrust and disregard for authority in TCI*'. There are no recorded cases of arrest or prosecution for violation of the turtle fishery regulations, despite apparent and significant violation since the Fisheries Protection Regulations were introduced in 1976 (Fleming 2001; Fletemeyer 1983).

These regulations were revised by the Fisheries Protection Ordinance 1998, but the provisions for turtle harvest remained the same. Section 14 of the Ordinance states:

'14.(1) Any person who takes or is in possession of or sells any marine product smaller than the legal size shall be guilty of an offence: provided that a person shall not commit an offence under this regulation if having inadvertently taken any marine product which is undersize, he forthwith returns the same to the water unharmed.

(c) *Turtles*

- (i) *Hawksbill Turtle (Eretmochelys imbricata) a shell measurement of 20 inches in length measured from the neck scales to the tail piece and a weight of at least 20 lbs;*
- (ii) *Green Turtle (Chelonia mydas) a shell measurement of twenty inches in length measured from the neck scales to the tail piece and a weight of at least 20 lbs;*
- (iii) *Any other turtle, a weight of at least 20 lbs.'*

Section 14 states:

- (1) *No person shall –*
 - (a) *take any turtle on any beach or at any place above the low water mark*
 - (b) *take or be in possession of or offer to buy or sell, any laid turtle eggs.*
- (2) *Any person who contravenes the provisions of this regulation shall be guilty of an offence.*

The National Parks Ordinance was also revised in 1998, and the National Parks Regulations – Section 8 under the Ordinance prohibit '*the taking of any animal or plant by any method on land or at sea*' in any designated National Park, Nature Reserve or Sanctuary.

During TRAFFIC surveys in the UK Overseas Territories in 1998, Allan (1998) found 6 restaurants in TCI selling turtle dishes and, surprisingly, 3 turtle carapaces for sale that had apparently been illegally imported from South-East Asia. Gaudian & Medley (2000) reported that local interest in turtle meat in TCI was 'waning' at the end of the 20th Century, while Bowen (2003) suggests that the diet of Turks and Caicos Islanders has changed significantly over the past few decades, with the consumption of some traditional dishes (including, for example, turtle stew), having declined, and food of USA origin, such as deep-fried chicken and pork ribs, becoming more prominent. Fleming (2001) concurs, reporting that in 2000, few turtles were thought to be taken, with only 3 or 4 fishers consistently taking turtles and others catching them opportunistically. Fleming cites Grand Turk, South Caicos and Salt Cay as centres of turtle fishing activity and describes contemporary fishing methods, including the setting of nets in creeks, as well as jumping and spearing turtles on the seagrass beds. The meat from this harvest is cooked at home or sold to '*restaurants catering to local people*' at US\$2 per lb live weight or US\$3 per lb for meat. Fleming (2001) cites one restaurant selling dishes of turtle stew and steak at between US\$14.95 and US\$16.95 per dish. Contrary to Fleming's perceptions, Rudd (2003) acknowledges that there is no information about catch levels, but estimates that the turtle harvest in TCI is '*likely in the hundreds per year*'.

Fleming (2001) did not find any turtle carapaces for sale in TCI during her survey in 2000, but claimed that they were regularly offered for sale to tourists in the mid-1990s. One turtle fisher reported to Fleming that in the early 1990's he would sell hawksbill scutes to Dominican traders at US\$20 per lb and others suggested that Dominican fishers illegally fished for turtles on TCI's Mouchoir Banks. Marte *et al.* (2003) report that there is an extensive and illegal trade in tortoiseshell products in the Dominican Republic, which specifically targets visiting tourists. It is interesting to note that illegal trade of hawksbill scutes out of the Dominican Republic has been recorded and Fleming (2001) describes two incidents where Japanese customs officers seized two illegal shipments of raw hawksbill shell originating from the Dominican Republic in 1994. The seizures totalled over 600 kg of scutes and were confiscated from Japanese businessmen involved in the Bekko (tortoiseshell) trade. Marte *et al.* (2003) suggest that most tortoiseshell jewellery sold in the Dominican Republic appears to be made from the scutes of sub-adult and adult hawksbill turtles, which are apparently absent from Dominican Republic waters. Adult hawksbills are present in TCI's waters, and it is possible

that the scutes of adult turtles caught in the TCI turtle fishery have been exported to the Dominican Republic to supply the trade there. Fleming (2001) also reports on a historic link between the TCI turtle fishery and the Japanese market for hawksbill scutes, with Japanese customs reporting the import of a total of 234kgs of scutes from TCI in 1970 and 1971.

Summary

TCI waters appear to host significant foraging populations, and limited nesting populations, of green and hawksbill turtles. These have been extensively exploited for meat, eggs and shell for at least 1,300 years, and exploitation continues today. Despite successive 20th Century legislation regulating TCI's turtle fishery, some and perhaps most turtle fishers have ignored many of the regulations and this appears to have been largely ignored by the enforcement authorities. To date there has been no published or properly reported scientific monitoring of TCI's turtle fishery and without this data, or data pertaining to the origins of TCI's mixed stock foraging populations, it is impossible to accurately determine the impact of TCI's turtle fishery on

Measures of direct exploitation	Past	Present	Never	No response or not applicable
By life stage				
Females on beaches	0	0	50	42
Eggs from beach	17	7	68	0
Turtles in water (intentional)	15	35	8	34
Turtles in water (incidental)	NA	8	50	34
By product				
Meat				
Fishers who sell meat	9	22	18	43
Meat vendors	6	10	8	69
Meat consumers	25	52	14	1
Eggs				
Collectors who sell eggs	1	0	18	73
Egg consumers	18	13	60	1
Non-edible				
Fishers who sell shells	2	1	46	43
Shell vendors	1	0	23	68
Shell consumers	11	4	75	2
Worked shell consumers	8	3	79	2
Measures of indirect exploitation				
Turtles indirectly used in business	7 advertising	16 attraction	14 feature of professional activities	
Total interviews	92			

Table 9.5. Summary of TCOT interviewees involved in marine turtle use in TCI, categorised by type of use.

Are you aware of any activities that infringe on TCI turtle harvest laws (n=92)?			
	Yes	No	No answer
n=	17	72	3
%	18.5	78.3	3.3

If yes, what are they (n=17, multi-answers allowed)?					
Infringements	Capture of undersize turtles	Collecting eggs	Harvesting nesting turtles	Turtle fishing in National Parks	Exporting meat (to Miami)
n=	10	4	2	3	1

Who is engaged in activities that infringe on these laws (n=17, multi-answers allowed)?						
Social group	Native	Naturalised	Resident	Visitor (tourist)	Haitian/ Dominican migrant fishermen	Don't know
n=	10	0	1	2	5	1

Table 9.6. TCOT SEQ interviewee perceptions of infringements of TCI legislation.

these foraging populations or nesting populations of origin. However, it is reasonable to predict that the extensive, long-term harvest of nesting female turtles and their eggs in TCI will have had significant, adverse impacts on the islands' turtle nesting populations.

9.7.1. Data from TCOT SEQ

Table 9.5 gives a summary of the type of use current marine turtle use as identified by the TCOT SEQ. Despite current and long-standing legislation (see section 9.3) regulating turtle harvest in TCI, only 51 (55.4%) of the 92 TCOT SEQ interviewees claimed to know any details about this legislation. Forty (43.5%) could not describe any laws and 1 did not answer. Of those 51 that suggested they could describe the law, 41 (80.4%) mentioned the size limit, 7 (13.7%) mentioned the prohibition of egg harvest, 3 (5.9%) mentioned the prohibition of nesting female harvest, 5 (9.8%) mentioned no harvest in National Parks, 1 thought that there was a quota in effect, 1 thought there was a total ban on turtle fishing and 2 respondents thought there were no laws regulating turtle harvest. Eight interviewees volunteered measurements for the legal size limits, but 7 of these were incorrect.

When the 92 TCOT SEQ interviewees were asked if they could describe legislation regarding purchase of turtle products, only 16 (18.5%) suggested they could describe the legislation, whereas 72 (78.3%) said they could not. Of those that suggested they could describe the legislation, only 1 respondent mentioned the prohibition of purchase of eggs, 4 mentioned the prohibition of purchase of undersize turtles, 5 mentioned a prohibition on the export of turtle shells, 1 thought that purchase of shells was prohibited, 1 thought that purchased turtles had to be slaughtered immediately after purchase and 3 respondents thought there were no laws regarding purchase of turtle products. TCOT staff also encountered situations where DECRC officers appeared to be unaware of the details of the turtle harvest legislation.

Table 9.6 gives an overview of TCOT SEQ interviewee perceptions regarding violation of turtle harvest laws in TCI. Only 18.5% (n=17) of interviewees said they were aware of legislation infringements. The most commonly identified infringement was the capture of undersize turtles (n=10), followed by the harvest of eggs (n=4). Interviewees also identified the capture of nesting females, fishing in National Parks and the illegal export of turtle meat.

Most interviewees who were aware of infringements believed that native TCI Islanders (n=10) were responsible, followed by migrant fishers (n=5), while interviewees also thought that some expatriates and tourists were responsible for infringements.

Summary

There appears to be very low awareness of the current regulations regarding marine turtle harvest in TCI, even amongst some DECRC officers, and this may be a factor influencing apparently poor compliance and enforcement. Effective legislation is an important component of a turtle management strategy. It is therefore essential that DECRC staff and the TCI public have a better understanding of the current legislation if it is to be generally respected and complied with by the TCI public.

Recommendation

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- b) Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.

9.7.2. Harvest of adults on the nesting beach

The harvest of nesting female turtles has been prohibited by TCI legislation since 1976. None of the fishers interviewed for the TCOT SEQ who currently catch or formerly caught turtles said that they catch the females on the nesting beach, although 2 TCOT SEQ interviewees believe that this still occurs (see section 9.7.1). Two turtle consumers, both over 45 years old and born on Salt Cay, said that when they were children their fathers used to catch and kill nesting female turtles on Salt Cay beaches. This was apparently common practice at the time. In an informal interview with Alton Higgs, an elderly bush doctor, beachcomber and resident of Middle Caicos, Higgs said that up to the 1970s nesting female turtles were more common in TCI and men would regularly turn and slaughter nesting females at night. One Grand Turk resident and TCOT SEQ interviewee recalled how he used to encounter local men turning and killing nesting females on Grand Turk until the early 1990s. While this practice may once have been commonplace in TCI, nesting females turtles are rarely encountered by TCI islanders these days, as nesting appears to be limited to remote cays that are rarely visited at night. Illegal harvest of nesting turtles is therefore likely to occur only occasionally. Nesting females may still be caught occasionally at sea, and TCOT staff sampled an adult female green turtle in September 2002, which had developing eggs in the ovaries, that may well have been caught during an inter-nesting interval.

9.7.3. Harvest of eggs

The harvest of turtle eggs was prohibited in 1976, although Fletemeyer (1983) reports that turtle egg harvest continued in the early 1980's. TCOT SEQ identified 7 (7.6%) of the 92 respondents who still collect turtle eggs and 17 who used to collect eggs. As can be seen in Table 9.7, of the 17 former turtle egg collectors, over 40% (n=7) continued to collect turtle eggs after the practice was prohibited in 1976, reinforcing Rudd's (2003) assertion that compliance with fishery regulations in TCI is poor. When asked to give reasons why they stopped collecting eggs, only 1 of the 17 former egg collectors cited the law as a reason, 6 said that they no longer visit the beach, 4 said that they only used to collect eggs as children with their fathers, 4 suggested that they had gained a conservation awareness, 1 said that they had only collected as a one-off event and 1 said that turtle nests were no longer available.

Of all 24 former and current egg collectors identified during TCOT, 50% (n=12) said that they collected eggs opportunistically, whereas 3 suggested other factors that influenced when they collected eggs (season, full moon and personal desire) and 9 did not suggest such factors. Only one interviewee said he sold turtle eggs, but had stopped visiting the beaches and collecting in 1990. Prior to that he sold turtle eggs for US\$3 for a dozen to South Caicos men, who considered the eggs to have aphrodisiac properties.

Of the 7 current egg collectors, 5 said that they collect eggs on a yearly basis (between 2 and 4 times per year), 1 said that he collects eggs when the opportunity arises, and 1 (a South Caicos fisherman) claimed that he collects green turtle eggs on a monthly basis throughout the year. This individual expressed a preference for collecting green turtle eggs because he believed *'the taste is stronger'*.

During informal TCOT interviews, dive operators on Salt Cay claimed that occasional nests deposited on Salt Cay and neighbouring Big Sand Cay are still collected by Salt Cay residents. Furthermore, TCOT staff witnessed freshly laid turtle eggs of unknown origin or species being offered to bystanders in Cockburn Harbour, South Caicos in May 2003 and DECR officers made no attempt to enforce the law. TCOT SEQ identified 18 (19.6% of all 92) interviewees who formerly consumed turtle eggs and 13 (14.1%) interviewees who currently consume turtle eggs. Of the 18 former egg consumers, only 2 cited the law as a reason for stopping. Five said there was no longer any opportunity to eat eggs, 2 said they had developed an allergy to the eggs, 1 said he had developed a dislike of the eggs, 4 said they were no longer fishing (and so were no longer finding nests) and 4 did not provide an answer.

Of the current egg consumers, only 3 stated how they get the eggs. Two said that they receive them as gifts on a yearly basis and one Grand Turk resident claimed that she buys them from fishers every week during June and July for US\$1 per dozen. TCOT SEQ did not distinguish between follicular (unlaid) eggs, which can be legally traded under the Fisheries Protection Regulations 1998, and laid eggs, which cannot be traded. It is possible that some of the egg consumption recorded by TCOT SEQ involved unlaid eggs.

Year stopped collecting eggs	'60's	'70's	'80's	'90's	2000's	Year stopped not recorded	Still collecting	Never collected
No. of TCOT SEQ interviewees	3	4	2	4	1	3	7	68
% of former egg collectors (n=17)	17.6	23.5	11.8	23.5	5.9	17.6	Na	Na

Table 9.7. Summary of egg collecting history of TCOT SEQ interviewees (n=92).

Summary

Despite current legislation, egg harvest and consumption continues in TCI. Although the scale of current harvest is unclear, prolonged and extensive egg harvest has the potential to adversely affect small nesting populations of turtles. TCOT therefore recommends that DECR makes every effort eliminate egg harvest in TCI through education and enforcement.

Recommendations

9.1.1.1. Increase the capacity of the Department of Environment and Coastal Resources and the Protected Areas Department

- a) *Ensure DECR/PAD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes. Given the importance of all natural resources in the network of Protected Areas, and apparent poor compliance with the National Parks Ordinance, TCOT recommends that an increased capacity to effectively patrol the protected areas should be treated as a priority.*

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- b) *Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.*

9.7.4. Harvest at sea

The harvest of turtles at sea appears to be the most prevalent form of turtle harvest in TCI. TCOT SEQ interviewed 13 former and 45 current fishers (total =58). Fifty-two of these fishers targeted conch, 54 targeted lobster, 54 targeted fish and 49 (84.5%) catch or have caught turtles. Of the 45 current fishers, 25 (55.6%) claimed that lobster was their most important target species, 15 (33.3%) identified finfish, 4 (8.9%) identified conch and 1 fisher did not answer the question. None of the current fishers identified turtle as their most important target species.

Fifteen (30.6%) of the 49 fishers who claimed they catch turtles no longer do so. One of these fishers ceased turtle take in the 1950's, 1 in the 1970's, 4 in the 1980's, 4 in the 1990's and 2 since 2000. Six (40%) of the 15 said they stopped turtle fishing because they arranged alternative employment or no longer had the time to fish, which were the dominant reasons given for stopping. Two respondents said they stopped because they had retired, 2 said they had stopped due to personal ethics (conservation), 2 stopped fishing due to ill health, 2 said they stopped catching turtles

because the fishery was no longer economically viable for them, 1 respondent stopped because he moved away from the islands and 1 did not answer the question. Of these 15 fishers, only 1 said turtles were a very important component of his catch before he stopped taking them, 4 said they were somewhat important and 6 said they were unimportant, while 4 did not answer the question. Therefore, according to the TCOT SEQ interviewees, turtles are of limited importance to current and recent historical fisheries by TCI fishers.

However, 75.6% (n=34) of the 45 current fishers interviewed during TCOT SEQ currently catch turtles. In addition, TCOT SEQ identified one bar owner from Providenciales who does not regularly fish, but occasionally catches turtles for sale as turtle meat dishes at his bar. Therefore it is possible that more TCI Islanders occasionally catch turtles for consumption, but are not registered fishers. Including the above mentioned bar owner, the total number of TCI Islanders currently catching turtles identified by the TCOT SEQ is 35 and the total number of current and former turtle fishers is 50. Of these, 33 (66%) catch or caught turtles opportunistically (while targeting other species), 7 catch or caught turtles intentionally, 9 catch or caught turtles both opportunistically and intentionally and 1 fisher did not give an answer to the question.



Photo 9.17. A fisher butchers turtle meat in Cockburn Harbour South Caicos (Photo P. Richardson).

Forty-seven (94%) of all 50 turtle fishers said they preferred to catch green turtles, 1 preferred hawksbill, 1 had no preference and 1 did not answer the question. Eighteen (36%) of the 50 turtle fishers said they preferred hawksbill turtle as their second choice while 1 fisherman said that he prefers to catch hawksbills as a first choice. Forty fishers offered a reason why they preferred to catch green turtles, with '*better taste*' as the dominant reason given (n=21), followed by '*better meat*' (n=9) '*more demand*' (n=7) and '*meat has better texture*' (n=3). The one fisherman who preferred to catch hawksbills said he preferred them because they are easier to catch and more abundant than the other species. Three fishers gave reasons why they caught hawksbills as a second choice, including '*for the shell*' (n=2) and '*easier to catch*' (n=1). Four fishers gave reasons why they tend not catch loggerheads, including meat's '*strong smell*' (n=1), '*poor taste*' (n=2) and '*poor texture*' (n=1).

As expected with a regulated fishery with no closed season, no seasonality of turtle fishing was detected in TCI, with 37 (74%) of the 50 turtle fishers claiming that they caught or catch green turtles all year, whereas 28 (56%) said that they catch or caught hawksbills all year. Of the 35 current fishers, 15 said that they catch turtles on a yearly basis, 3 said that they catch them on a monthly basis, 6 said that they catch them on a weekly basis and 11 did not give an answer to the question. None of the current turtle fishers said that they catch turtles on a daily basis. The factors influencing when fishers catch turtles included '*to make money*' (n=24), '*demand*' (n=21), '*personal choice*' (n=13), '*opportunistic*' (n=4), '*sport*' (n=1), '*weather*' (n=1) and bycatch (n=1).

A few of the older retired fishers described the recent historical use of turtle nets strung across creeks to catch turtles, especially in North and Middle Caicos, but nowadays turtles tend to be caught by hand. This involves chasing turtles in boats on the shallow seagrass beds and jumping on them when they tire, or snagging hawksbills with lobster hooks while fishing for lobster on coral heads. Twenty-four (68.6%) of the 35 current turtle fishers reported catching green turtles by hand or with a lobster hook, 20 (57.1%) reported catching hawksbills by hand or lobster hook, with other methods used to catch greens and hawksbills including nets (n=2), Hawaiian sling (n=2) and speargun (n=1).

Recorded green turtle harvest: Thirty-one (88.6%) of the 35 current fishers gave estimates of their average annual green turtle harvest, with estimates ranging from 1 turtle per year to 50 per year and a mean of 6.7 per year (Median (IQ range); 5 (2-9.5)) and a total estimated average catch of 209 green turtles per year for these 31 fishers. If the average catch is applied to the fishers who did not report catch numbers, then annual green turtle catch is probably closer to 236 turtles for all current turtle fishers identified by TCOT SEQ.

Green turtles of various sizes are currently caught with smallest reported at 2.3kg and the largest reported as

226.8kg. Twenty-five of the 35 current turtle fishers offered estimates of the average sized green turtle they catch. These ranged from 11.3kg to 90.7kg, with a mean of 32.4kg $\pm$ SD19.7kg. Therefore adults and small juveniles are caught, but larger juveniles and sub-adults tend to make up the majority of the catch.

Recorded hawksbill harvest: Twenty-three (65.7%) of the 35 current fishers gave estimates of their average annual hawksbill turtle harvest, with estimates ranging from 1 turtle per year to 30 per year and a mean of 5.3 per year (Median (IQ range)=3(1.5-5)) and a total estimated catch of 121 hawksbill turtles per year for these 23 fishers. If the average catch is applied to the fishers who did not report catch numbers then the average annual hawksbill turtle catch is probably closer to 184 turtles for all current turtle fishers identified by TCOT SEQ.

Hawksbill turtles of various sizes are currently caught, with the smallest reported at 4.5kg and the largest reported as 158.7kg. Twenty of the 35 current turtle fishers offered estimates of the average sized hawksbill turtle they catch. These ranged from 13.6kg to 90.7kg, with a mean of 36.7kg $\pm$ SD21.4kg. Therefore adults and small juveniles are caught, but larger juveniles tend to make up the majority of the catch. It is worth noting that DECR staff witnessed the landing of an adult female hawksbill (80cm CCL) captured at Pear Cay within the French, Bush and Seal Cays Sanctuary. The turtle was butchered for sale.

NB. TCOT SEQ interviews with turtle fishers were usually carried out in the presence of a DECR officer associated with a government department responsible for the enforcement of the Fisheries Protection Ordinance. After some interviews, DECR officers privately commented to TCOT staff that turtle fishers had under-reported their catch during interviews. TCOT SEQ indicates a very low level of awareness about current turtle harvest legislation in TCI and it is possible that fishers under-reported their catch due to concerns about whether or not they had infringed legislation they knew little about.

Loggerhead and leatherback harvest: No fishers claimed to prefer catching loggerheads and only 1 retired fisher claimed that he used to prefer loggerhead turtles as his second preferred species (after greens), and 1 current turtle fisher offered estimates for the number and size of loggerhead turtles caught. He claimed to catch 4 or 5 loggerheads per year ranging in size from 34 - 136kg. As discussed above, there is little demand or preference for loggerhead meat in TCI and the species is rarely encountered in TCI's waters. Therefore, while some loggerheads appear to be occasionally caught in TCI, they are not a viable or significant component of the TCI turtle fishery. TCOT SEQ suggests there is no harvest of or demand for leatherback turtles and their products in TCI.

Summary

Turtle fishers in TCI tend to catch turtles on an opportunistic, yearly basis, with a view to selling the turtle or meeting a known demand. TCOT SEQ identified at least 16 fishers who intentionally target turtles and at least 9 fishers who

catch turtles on a weekly or monthly basis, probably to meet known demand.

In 2003, there were 491 commercial fishers licensed to fish in TCI in 2003 (J. Campbell (DECR) pers comm. 2004), and if the TCOT SEQ sample was representative, then approximately 371 (75.6%) of TCI fishers may still be catching turtles. However, the TCOT SEQ sample is not representative, for the following reasons:

- In South Caicos, where most of the fishers were interviewed during TCOT SEQ, DECR officers assisting TCOT staff with the SEQ would specifically contact fishers who were known to target turtles. It is highly likely that because of DECR's assistance, the TCOT SEQ sample of 16 intentional turtle fishers included most fishers who are known to specifically target turtles.
- South Caicos fishers tend to fish in pairs or larger crews, and it is possible that if more than 1 person was interviewed from any pair or crew, then the number of turtles caught by individual crews may have been double counted in the TCOT SEQ survey.
- TCOT SEQ interviewed 31 fishers resident in South Caicos (the TCI's major fishing population), 14 resident in Providenciales, 7 in Grand Turk and 4 in Salt Cay, but

only 1 (retired) fisherman resident in North Caicos and 1 former fisherman from Middle Caicos. No licensed or unlicensed expatriate fishers (Haitian and Dominican) were interviewed and therefore they, and fishers from North and Middle Caicos are under-represented in TCOT SEQ.

While the actual number of fishers who catch turtles in TCI is not known, only 9.2% of the licensed fishers in TCI were interviewed during TCOT SEQ, and therefore the 34 fishers identified during TCOT SEQ probably represent only a fraction of the number of individuals currently engaged in turtle harvest. The majority of fishers who catch turtles reported that they do so on an opportunistic basis and it is therefore reasonable to assume that, based on the TCOT SEQ, and given the limited regulation and enforcement of the turtle fishery, many more fishers in TCI will opportunistically catch a turtle if they think they can sell or use it. Furthermore, several fishers interviewed during TCOT SEQ claimed that migrant fishers from the Dominican Republic and Haiti currently catch turtles. Gaudian & Medley (2000) estimated that there were about 3,000 illegal immigrants in TCI, but the TCOT SEQ did not interview any migrant fishers.

To date there has been no monitoring of the turtle fishery in TCI and therefore it is impossible to accurately quantify the current harvest of turtles in TCI. TCOT SEQ indicates that most fishers catch turtles opportunistically. Twenty-

a There should be regulations for which species of turtle can be caught				
	yes	no opinion	no	na
n	19	5	21	3
%	38	10	42	6
b There should be regulations for the type of fishing gear and methods that can be used to catch turtles				
	yes	no opinion	no	na
n	27	3	15	3
%	54	6	30	6
c There should be regulations for the number of turtles that can be caught				
	yes	no opinion	no	na
n	24	2	17	3
%	48	4	34	6
d There should be size limits for turtles caught				
	yes	no opinion	no	na
n	42	0	20	3
%	84	0	40	6
e Open and closed zones should be set for turtle fishing				
	yes	no opinion	no	na
n	25	0	20	3
%	50	0	40	6
f Open and closed seasons should be set for turtle fishing				
	yes	no opinion	no	na
n	24	3	18	3
%	48	6	36	6

Table 9.8. Current and former turtle fisher attitudes to potential conservation options (n=50).

Question: Who should be involved in setting regulations (multiple responses allowed)?

Category	No. of responses	Percentage of fishers
Fishers	21	42
Government	12	24
DECR	33	66
Parks Department	3	6
Local People	2	4
Tour operators	1	2
Scientists	1	2
Other	1	2
Not applicable (no laws necessary)	3	6
No answer	3	6

Table 9.9. Turtle fishers' (n=50) opinions on who should be involved in setting turtle harvest regulations.

two fishers who only catch turtles opportunistically offered average annual green turtle catch values during TCOT SEQ and 15 fishers who only catch turtles opportunistically offered average annual hawksbill turtle catch values. Their average annual takes were $4.7 \pm \text{SD}3.3$ green turtles per year and $5.6 \pm \text{SD}6.6$ hawksbills per year (TCOT SEQ indicated that while hawksbills were not the preferred species, TCOT sampling and TCOT SEQ suggested that they were easier to catch, especially by lobster fishers, and therefore may be more likely captured by opportunistic turtle fishers). The 22 opportunistic green turtle fishers represent 48.9% of the total current fishers identified during TCOT SEQ and the 15 opportunistic hawksbill turtle fishers represent 33.3%. While the fishers in the TCOT SEQ sample may not be representative for the reasons given above, if 48.9% of TCI's licensed fishers catch 4.7 green turtles each per year and 33.3% of TCI's fishers catch 5.6 hawksbills each per year, then the TCI annual green and hawksbill turtle harvests may be as high as 1,128 green turtles per year and 907 hawksbill turtles per year respectively.

Therefore, the likely annual take of green turtles in TCI is between 236 and 1,128 turtles and the likely annual take of hawksbill turtles is between 184 and 907 turtles. Due to the sampling biases described above, these are low confidence estimates. However, TCOT SEQ indicates that several thousand kilograms of turtle meat is probably consumed in TCI each year (see section 9.7.5.2), and these estimated annual take values would be required to satisfy this demand. These estimates represent the largest current annual take of marine turtles in the UK Overseas Territories in the Caribbean.

Attitudes of fishers towards potential conservation measures

Table 9.8 presents turtle fishers' attitudes to fishery conservation options. Three (6%) former turtle fishers thought that turtle fishing should be prohibited in TCI and therefore did not think that any of the harvest management options were applicable. The TCOT SEQ revealed general consensus of opinion about only one of the fishing

options. However, more of TCI's former and current turtle fishers agreed with the potential conservation measures than disagreed, with the exception of species protection regulations, where 42% of the fishers disagreed with species protection regulations compared to 38% who agreed.

The only option that did solicit general consensus amongst the turtle fishers was the size limit option, where 84% agreed and 6% disagreed. All 25 of the 42 turtle fishers who agreed with size limits and justified their position suggested that a *minimum* size limit is necessary. It is worth noting that, despite this apparent agreement with the current minimum size limit, the capture of undersize turtles was the most commonly identified infringement of TCI's Fisheries Protection Ordinance, 1978 (see section 9.7.1). Therefore, while fishers may appreciate this regulation, compliance amongst fishers may be low. The majority of turtle fishers also agreed with regulations for the type of fishing gear and methods used to catch turtles. Of the 27 fishers who agreed with regulations, 12 suggested spearguns should be banned, 9 suggested that nets should be banned, 7 suggested turtles should only be caught by hand and 2 said that nets should be allowed.

It is interesting to note that 40% of turtle fishers disagree with the concept of open and closed zones for turtle fishing. This significant disagreement may explain why there is apparent poor compliance with the National Parks Ordinance amongst TCI's fishers.

Table 9.9 shows the opinions of the 50 turtle fishers with respect to which institutions should be responsible for setting marine turtle fishery regulations. As expected, 66% believe that the DECR should be involved in setting the regulations. Forty-two percent of these fishers also believed that fishers should be involved in the process of establishing fishery regulations. That there is less agreement among fishers on management options in TCI than in other OTs (see other OT reports) suggests fisher inclusion in the discussion of changes to the fishery in TCI will be particularly important.

Recommendations

9.1.2.1. Amend harvest legislation:

TCOT recommends that the Fisheries Protection Ordinance, 1998 is amended to include the following provisions:

- a) Ensure permanent and complete prohibition of harvest of any large, reproductively valuable turtles by instigating a maximum size limit. A suggested maximum may be 50lbs (22.7kg) or less, but should be based on additional research on the fishery and turtle stocks. This research should also yield an equivalent maximum curved carapace length for green and hawksbill turtles that should be stipulated in any amended legislation.
- b) Consider a continued minimum size limit, as most fishers already accept this as an established conservation measure. A suggested minimum would be 20lbs (9.07kg) with an equivalent minimum curved carapace length for green and hawksbill turtles that should also be stipulated in any amended legislation.
- c) Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to DECR (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by DECR. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The DECR should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level.
- d) Establish a closed season to be reviewed every five years (to facilitate legislative adaptation to possible nesting season shift caused by climate change) to prevent capture of adult turtles entering TCI's waters to breed.



Photo 9.18. TCOT staff sample hawksbill turtle meat at a restaurant in Providenciales (Photo S. Ranger).

The shells of green turtles tend not to be sold because the marginal scutes are used, along with plastron and the head, and are boiled to make 'jelly' for soups and stews. The intestines are cleaned and used as is all muscle tissue and the flippers. All these body parts are classed as meat for the purposes of TCOT SEQ. The portion of green turtle carapace including the costal and vertebral scutes is discarded, as is the cloaca. Hawksbill carcasses are similarly used, except the carapace is often left intact for sale or to extract the scutes for sale, because the marginal scutes cannot be used to make 'jelly' and therefore the shells are potentially worth more intact.

9.7.5.1. Sale of meat by turtle fishers

The market for turtle meat in TCI appears to be driven primarily by restaurants catering to local people and special orders for turtle meat from private customers, often ordered for dinner parties and celebrations, e.g. birthdays. Indeed, turtle was served at the lunch break of the DECR-organised Annual Fishermen's Day in South Caicos in July 2003.

Sale of whole turtles: Eight of the 15 fishers who sell whole turtles offered information regarding the annual amount of whole green turtles they sell. They sold between 1 and 12 whole green turtles per year, with a mean of 4.7 (SD=4.3). Twelve fishers offered information on their price for whole green turtle sales, ranging from US\$2 per lb to US\$3.5 per lb with a mean of US\$2.6 (SD=0.7).

9.7.5. Trade in turtle meat

Turtle meat is the primary turtle product traded from the TCI turtle fishery. Of the 35 current turtle fishers, 22 (62.9%) said that they sold turtle products, while 13 (37.1%) said that they did not. Of these 22, 15 (68.2%) sell the turtle whole, 18 (81.8%) sell the butchered meat, 8 (36.4%) sell the carapace and 2 (9.1%) sell shell pieces.

Only 2 of the 15 fishers who sell whole turtles offered information regarding the annual amount of whole hawksbill turtles they sell. They sold 1 and 12 whole hawksbill turtles per year respectively. Nine fishers offered information on their price for whole hawksbill turtle sales, ranging from US\$1 per lb to US\$3.5 per lb with a mean of US\$2.5 (SD=0.6). The fishers set these prices, which occasionally change but not significantly. Most of these fishers sell whole turtles at the fish landing site (n=10), over half sell whole turtles at the restaurants they supply (n=7), while others sell them at customers homes (n=4), at markets (n=2, both Grand Turk), on the street (n=2) and hotels (n=1). Some fishers said they charge restaurants and hotels more than they do private customers.

Sale of butchered turtles: Nine of the 18 fishers who sell butchered turtles offered information regarding the annual amount of butchered green turtles they sell. They sold between 1 and 12 butchered green turtles per year, with a mean of 4.7 (SD=±3.3). Sixteen fishers offered information on their price for butchered green turtle meat, ranging from US\$2 per lb to US\$3.5 per lb with a mean of US\$3.1 (SD=1).

Four of the 18 fishers who sell butchered turtles offered information regarding the annual amount of butchered

hawksbill turtles they sell. They sold between 1 and 2 butchered green turtles per year, with a mean of 1.4 (SD=0.5). Nine fishers offered information on their price for butchered hawksbill turtle meat sales, ranging from US\$0.5 per lb to US\$4.5 per lb with a mean of US\$2.7 (SD=1). The fishers set these prices, which rarely change. Most of these fishers sell butchered turtle meat at the fish landing site (n=14), some sell to the restaurants (n=5), some sell at the homes of private customers (n=4), some sell at markets (n=3) and some sell on the street (n=3).

Therefore, butchered meat is sold for more per weight than whole turtles and more fishers sell butchered meat than whole turtles. Turtle meat tends to be sold at the fish landing site, or directly to restaurants, with some sale at customer's homes and other locations. TCOT SEQ indicated that, with the exception of the fish market on Grand Turk, there were no retail outlets selling turtle meat in TCI and that leatherback and loggerhead meat is not sold.

9.7.5.2. Sale of meat by direct vendors

Twenty-four of the 92 TCOT SEQ interviewees worked for or owned a business that could sell turtle products, and of these 15 were restaurants, 5 gift shops, 1 a dive shop and 2 fish processing plants. Table 9.10 gives an overview of the history of sale of turtle products for these businesses.

Type of business interviewed during TCOT SEQ (n=23)				
	<i>Restaurant</i>	<i>Gift Shop</i>	<i>Dive Shop</i>	<i>Fish Processing Plant/ Fish market</i>
No.	15	5	1	2

Sale of marine turtle products (n=23)			
No. and type of business	<i>Currently selling</i>	<i>Formerly sold</i>	<i>Never sold</i>
	8 restaurants (meat) [6 in Provo, 1 in GT and 1 in S Caicos]	5 restaurants (meat) 1 gift shop (shells)	1 restaurant
	1 fish market (meat)		1 dive shop
			1 fish processing plant
			4 gift shops
			1 artisan

When stopped and reasons for stopping (n=6)				
<i>Reason/Date</i>	<i>1970's</i>	<i>1980's</i>	<i>1990's</i>	<i>2000's</i>
No demand	1 gift shop (shells)	1 restaurant	2 restaurants	na
Management change	Na	Na	1 restaurant	1 restaurant

Reasons for never selling (n=8)				
<i>Reason</i>	<i>Conservation awareness</i>	<i>No demand</i>	<i>Customer influence</i>	<i>Not started to sell yet</i>
Number	3 gift shops	1 Gift shop 1 Fish plant 1 restaurant	1 dive shop	1 shell artisan (currently works with conch shell but plans to start making tortoiseshell jewellery)

Table 9.10. Overview of direct turtle product vendors from TCOT SEQ.

Table 9.10 shows that lack of demand is the dominant reason why former turtle product vendors stopped selling products, and this is also one of the main reasons why some vendors have never sold turtle products. Three vendors have never sold products because of personal conservation awareness and 1 due to customer influence, presumably because the customers also have a conservation ethic. An increased conservation ethic amongst TCI's tourists may have also resulted in the lack of demand for turtle products that led to 4 vendors ceasing sale of turtle products between the 1970s and 1990s.

All 8 vendors currently selling turtle products are selling meat only. Of these, 8 purchase green turtles, 6 purchase hawksbill turtles and 1 (restaurant) does not distinguish between the species. The fish market owner buys turtle meat on a daily basis, whereas 2 restaurants buy it weekly, 2 restaurants buy it monthly, 3 restaurants buy it on a yearly basis and 1 restaurant buys turtle meat less than yearly.

One restaurant buys meat from fishers who deliver and also buys meat from the fish landing sites at the Five Cays fish processing plants at Provo. Four restaurants only buy meat from the fishers who deliver it, as does the fish market owner in Grand Turk. Three restaurants only buy meat from fish landing sites (Quayside at Leeward Marina - Provo, Five Cays - Provo, West Road - Grand Turk) and 1 restaurant owner in Providenciales catches his own turtles. Therefore the most common route that turtle meat takes to the vendor is via direct delivery by the fishers, followed by purchase at the fish landing sites. Seven of the current vendors reported that the fishers determine the price they pay for turtle meat, whereas 1 vendor exchanges goods for the turtle meat he receives from fishers and 1 bar owner catches his own turtles.

Of the 15 current and former vendors, 12 claimed to have noticed trends in availability of turtle meat (changes in availability of other products was not recorded). Only 1 of these vendors (Grand Turk fish market owner) thought that availability of meat had increased in the last 5 years, whereas 3 thought it had decreased and 6 thought it had stayed then same (the other three vendors either did not know or did not answer the question). The fish market owner also thought that availability of turtle meat had increased since he could remember, 6 thought it had decreased and 4 thought it had stayed the same (the other 2 did not answer the question). Reasons for decreased availability included less turtles caught ($n=3$), less turtles available because they have been scared away ($n=1$) and less demand ($n=1$). The fish market owner thought that availability had increased because *'more turtles are being caught'*.

While there are no clear trends from these answers, availability of turtle meat has probably stayed the same in the last 5 years but has decreased since the respondents could remember. However, it is interesting to note that the fish market owner claims to notice more turtles being caught in the last 5 years and since he can remember, and this may indeed be the case in Grand Turk.



Photo 9.19. A typical turtle stew dish at a restaurant in Providenciales (Photo P. Richardson).



Photo 9.20. Turtle on the menu of a restaurant in Providenciales (Photo S. Ranger).

Eleven (73.3%) of the 15 current and former vendors said that they sell/sold turtle products all year, while 4 did not answer the question. Ten of these 11 vendors said that there were no particular holidays or events when they sold more turtle products and 4 did not answer the question. However, 1 former Providenciales restaurant owner claimed that more turtle is sold to male clients during the August Carnival and the fish market owner said that he sells more turtle meat at Christmas and Easter. Therefore, turtle products are sold all year round, and there may be increased demand in Grand Turk and Providenciales during some holiday periods

Three restaurants offered information regarding the number of turtle dishes they sell per week, amounting to 12 dishes per week, 15 dishes per week and 95 dishes per week. Eight restaurants offered information about the price of their turtle dishes, which ranged from US\$5 per dish to US\$12 per dish with a mean of US\$8.7 per dish ($SD=2.5$). Therefore, TCI restaurants selling turtle meat may generate between approximately US\$100 to US\$760 or more gross income

per week from selling turtle dishes. It is therefore of little surprise that 2 (22.2%) of the 9 current turtle vendors said that the sale of turtle meat was very important, 3 (33.3%) said that it was somewhat important and 4 (44.4%) said it was unimportant to their business. Therefore, over half of these vendors suggested that the sale of turtle meat is of some importance to their businesses.

Of the 14 current and former turtle meat vendors (excluding the former shell vendor), 10 noticed trends in the demand of turtle products and 4 had not noticed trends. Of these 10 vendors, 1 said that demand had increased in the last 5 years, whereas 1 said that demand had decreased and 5 said that it had stayed the same. Three did not answer the question. In contrast, while 1 vendor thought that demand had increased since they could remember, 6 vendors said that demand had decreased and 3 said that it had stayed the same. Again, while trends are difficult to distinguish from these answers, demand for turtle products has probably stayed fairly constant in the last 5 years, but has decreased in the living memory of these vendors. The vendors did not provide any dominant reasons for perceived changes in demand, with only 4 offering reasons for decrease, including ‘migration of people’ (away from South Caicos, n=1), ‘other meats available’ (n=1), ‘young people don’t like turtle meat’ (n=1) and ‘less turtles caught’ (n=1). These reasons were corroborated during an interview with David Bowen, the Director of the Department of Culture, who has recently written about the changing diet of Turks and Caicos Islanders (Bowen 2003). Reasons for an increase in demand included ‘increased demand due to decreased availability’ (n=1) and ‘tourism’ (n=1).

Contrary to Fleming’s (2001) assertion that turtle meat is sold in ‘restaurants catering for local people’, tourists may well present a significant demand for turtle meat. Four (28.6%) of the 14 current and former turtle meat vendors stated that tourists were among the main purchasers of turtle meat. However, local people do provide an important market for turtle meat and 11 (78.6%) vendors stated that local people were their main customers, 1 vendor stated that expatriates were among their regular customers and 2 vendors stated that visitors from neighbouring Caribbean states were among their important customers. One restaurant owner said that Haitian and Dominican workers particularly like to eat turtle.

Summary

While the availability and demand for turtle shell has decreased in the last few decades, there is still a thriving commercial trade in turtle meat in the Turks and Caicos Islands. Turtle dishes are financially important to the restaurants that sell them, which are found mainly in Providenciales and Grand Turk, and sold throughout the year to tourists, expatriates and mainly local people who provide a thriving demand for turtle meat dishes. This demand may have decreased in recent decades, as a diversity of imported foods has become more popular with younger generations of Turks and Caicos Islanders.

Recommendation

9.1.2.3. Recommendations regarding Multilateral Environmental Agreements and TCI national legislation

- b) Given that article III of CMS accommodates the needs of traditional subsistence users of marine turtles, the Government of TCI should consider the role of trade in the subsistence fishery economy of TCI, and limit commercial activities regarding the sale of turtle products.

9.7.5.3. Consumption of turtle meat

There is a strong tradition of marine turtle consumption in the Turks and Caicos Islanders, which is still manifested in the current population. Of the 92 TCOT SEQ interviewees, 79 (85.9%) reported some form of turtle consumption, while 12 (13%) reported no use at all. 1 interviewee did not answer questions regarding use. However, this sample is not representative as there is a very strong sampling bias towards fishers, a social group that is likely to use turtle products more than other groups. Table 9.11 presents an overview of the TCOT SEQ interviewees’ turtle consumption.

A significant percentage (83.7%) of interviewees has eaten or currently eats turtle meat, with over half of the sample reporting that they currently eat turtle meat. In contrast, significant percentages have never eaten eggs (65.2%), never used whole shells (81.5%) or never used worked shells (85.9%).

	Meat	Eggs	Whole shell	Worked shell
Currently	52	13	4	3
Formerly	25	18	11	8
Never	14	60	75	79
Not recorded	1	1	2	2

Table 9.11. An overview of the turtle consumption history of TCOT SEQ interviewees (n=92).

In the last 5 years...				
	Increasing	Decreasing	Same	Don't know
Number	1	16	15	5
%	2.7	43.2	40.5	13.5

Since you can remember...				
	Increasing	Decreasing	Same	Don't know
Number	1	20	13	2
%	2.7	54.1	35.1	5.4

Table 9.12. Former and current turtle meat consumers perceptions of trends in turtle meat availability (n=37).

Ten interviewees gave reasons for why they no longer eat meat, 7 of whom said it was due to ethical reasons (e.g. religion, vegetarianism and conservation), 2 said they have never had the opportunity and 1 said that they were not interested. Twenty-three interviewees gave reasons why they had stopped eating turtle meat, with no dominant reasons emerging. Seven interviewees (30.4%) said they had developed a dislike for turtle meat and 5 (21.7%) said that they no longer have the opportunity to eat turtle meat, while other reasons included the development of *allergies to turtle meat* (n=3), *no longer fishing and so no longer catch turtles* (n=3), *ethical reasons* (n=3) and *no longer interested in eating turtle meat* (n=2).

Table 9.12 shows trends in availability of turtle meat as perceived by 37 former and current turtle meat consumers. Availability appears to have decreased or stayed the same in the last 5 years and decreased since the respondents could remember.

Turtle meat is not a staple component of the diet of most the 52 current turtle meat consumers identified by the TCOT SEQ. Almost half (n=25) eat turtle meat on a yearly basis, while 16 (30.8%) eat it on a monthly basis and 5 (9.6%) eat it on a weekly basis. Two consumers eat it less than once a year and 1 has only eaten it a few times in his/her life. Three current meat consumers did not answer the question. To most of these consumers, turtle meat represents a speciality dish that is infrequently consumed. As expected from the answers of turtle fishers regarding preferred species, of the 77 current and former turtle meat consumers, 61 (79.2%) said green turtle was amongst their preferred species. Seven (9.1%) included hawksbill amongst their preferred species, while 2 said they preferred loggerhead and 1 included 'mulatto'. Eight consumers said they did not have a preference and 9 consumers did not answer the question. Thirty-one current and former turtle meat consumers offered answers about when they purchase turtle products, and 28 of these stated that they buy turtle meat all year round. The other 3 gave different answers, which included different periods in the year.

Thirty-five current and former turtle meat consumers gifted turtle meat, with 88.6% (31) gifting to friends, 68.6% (24) gifting to family and 1 respondent each reporting that they gift meat to neighbours and customers (restaurant owner). Thirty-four current and former turtle meat consumers offered information about where they purchase turtle products. Ten said they buy it at fish landing sites, 10 said they buy it in restaurants, 7 said that fishers bring it to their homes, 3 said that they buy it in the market and 4 said they receive it as gifts.

Sixty (78%) of the current and former turtle meat consumers used turtle meat for food (TCOT SEQ did not record an answer from the other 17 consumers). These consumers would cook the meat into steamed steak, stew, soup, 'turtle balls', while some consumers simply fried or boiled the meat. The 52 current turtle meat consumers stated how much turtle meat they ate per year, ranging from 0.2kg to 43.5kg per year with a mean annual consumption of 7.1kg $\pm$ SD10.4. These 52 current turtle meat consumers are therefore eating approximately 369.2kg of turtle meat per year, although it is important to note that 63% (n=58) of the TCOT SEQ sample consisted of former and current turtle fishers, who may be more likely to eat turtle meat than other social groups. Therefore, there may be a significant bias towards turtle consumers in this sample. However, it is reasonable to assume that in a population of 20,000 people (with most being either TCI belongers, Haitians or Dominicans) in a country that has an established culture of turtle meat consumption, the number of current turtle meat consumers in TCI is one or two orders of magnitude greater than the number of current consumers identified during the TCOT SEQ. The annual consumption of turtle meat in TCI may therefore amount to thousands, and perhaps tens of thousands of kilograms of turtle meat per year.

Summary

The availability of turtle meat has decreased or stayed the same in the last 5 years but has decreased in the living memory of TCOT SEQ respondents. It is unclear why availability has decreased. However, foraging turtle populations have either remained stable or increased in

recent decades (see section 9.6.4), while demand for turtle meat has probably decreased in recent decades (see section 9.5.6.2). Therefore, the perceived decreased availability of turtle meat is more likely to be due to a decreased turtle fishery effort in response to decline in demand, rather than declining foraging turtle populations. Bowen (2003) suggests that new, imported foods have replaced traditional TCI foodstuffs, including turtle meat. Nevertheless, despite the decreased demand for and availability of turtle meat, a demand still exists amongst locals, tourists and other visitors to the islands. TCI fishers are catching hundreds, if not thousands of turtles, mostly juvenile green turtles, each year to satisfy this demand. Turtle meat consumers primarily buy turtle meat raw at the various fish landing sites (e.g. Five Cays – Provo, West Rd - Grand Turk, Cockburn Harbour – South Caicos), buy cooked turtle dishes at a number of restaurants on Providenciales and Grand Turk, or receive raw meat delivered to their homes by fishers.

9.7.6. Trade in shells and shell products

9.7.6.1. Sale of turtle shells

As described above, green turtle shells tend not to be sold individually but are butchered as meat. Only 3 of the 45 current turtle fishers said that they sell green turtle shells for between US\$25 and US\$50 per shell depending on the size. One of these fishers said that he sells about 5 green turtle shells per year at about US\$30 per shell. Only 1 current turtle fisher said that he currently sells 1-2 whole hawksbill turtle shells per year for about US\$50 per shell. Seven of the 15 former turtle fishers said that they used to sell hawksbill shells, usually to tourists, with 1 stating that he sold shells *'when the tourists were allowed to take them home'*. The shells were sold at between US\$25 to US\$60 each depending on the size, and were sold at customers homes (n=4), the fish landing site (n=3), market (n=1), restaurant (n=1), retail (n=1) and to tourists on yachts (n=1). In addition, 1 elderly former turtle fisher (>65 years old) recounted how, when he was a boy, his father would catch and preserve whole hawksbills to sell as curios to the foreign sailors on the boats that shipped salt out of TCI.

TCOT SEQ suggests that there was a limited trade of hawksbill and green turtle shells between TCI's fishers and tourists some years ago, but the trade seems to have largely died out. This is probably due to a decreased market as a result of increased tourist awareness regarding trade in endangered species. One fisher said that when there was a tourist market for turtle shells, the fishers would set the price. Nowadays if someone asks him for a turtle shell the customer will set the price depending on how much they are prepared to pay. While surveys of gift shops in TCI during TCOT were not exhaustive, they did not reveal any whole turtle shells for sale anywhere in TCI during field visits.

9.7.6.2 Sale of shell pieces

TCOT staff did not find any evidence of worked turtle shell for sale in any retail outlets in TCI. During TCOT SEQ, 3 fishers stated that they used to sell raw turtle scutes to

foreign traders but they have not done so for a long time. One fisher stated that *'Chinese people and people from the Dominican Republic used to come to South Caicos (1986-87) to buy shell, but don't come any more'*. Prices of hawksbill scutes during this time ranged from US\$2.50 per lb to US\$20 per lb of scute, with an average price of US\$12.50 per lb (n=5).

However, 1 fisher said that he currently sells about 1 to 2 hawksbill shells worth of scutes per year and another fisher claimed that several South Caicos fishers save the scutes from the hawksbills they catch to sell to a Dominican trader who lives on South Caicos. This report was corroborated by another from an old fisherman in South Caicos, who told TCOT staff that the discarded hawksbill shells often seen in Cockburn Harbour are left there so that the connective tissue decomposes, and the scutes can be easily removed for sale to Dominican traders.

As discussed in section 9.7, there is extensive illegal trade in tortoiseshell products in the Dominican Republic, and in recent years the Japanese authorities have seized illegal imports of hawksbill scutes from Japanese businessmen travelling from the Dominican Republic. TCOT was not able to assess the status of illegal trade in hawksbill scutes between TCI and the Dominican Republic, but based on TCOT SEQ it appears that a limited trade probably continues today.

Recommendations

9.1.1.1. Increase the capacity of the Department of Environment and Coastal Resources and the Protected Areas Department

- a) *Ensure DECR/PAD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes. Given the importance of all natural resources in the network of Protected Areas, and apparent poor compliance with the National Parks Ordinance, TCOT recommends that an increased capacity to effectively patrol the protected areas should be treated as a priority.*

9.1.2.3. Recommendations regarding Multilateral Environmental Agreements and TCI national legislation

- a) *CITES should be extended to TCI as soon as possible, and the appropriate domestic legislation drafted and gazetted, to address the possible trade of hawksbill scutes from TCI to neighbouring states.*

Have you ever accidentally caught turtles while fishing for other target species?				
	Yes		No	
No.	8 (7 current, 1 former fisher)		50	
%	13.8		86.2	
No. of turtles caught accidentally each year (n=8)				
No. caught	Once	1-2 per year	3-4 per year	10-12 per year
No. respondents	2	3 (incl. 1 former fisher)	1	2
State of turtles caught accidentally (n=8)				
	Mostly alive	Equal dead and alive	Mostly dead	
No. of respondents	8	0	0	
Methods used when accidentally catching turtles (n=8)				
	Gill nets (for bonefish)		Hook and line	
No. of respondents	3		5	
Species caught (n=8, multiple answers)				
	Green	Hawksbill	Loggerhead	
No. of respondents	7	2	1	
Fate of turtles captured accidentally (n=8)				
	Release	Sell	Use	
No. of respondents	3	2	3	
Do you think other fishers accidentally catch turtles? (n=58)				
	Yes	No	Don't know	No answer
No. of respondents	6	1	2	49
What is the fate of these turtles? (n=6)				
	Release	Sell	Use	
No. of respondents	0	3	3	

Table 9.13. Overview of incidental capture of turtles.

9.7.7. Incidental catch in marine fisheries

Incidental capture of turtles in TCI appears to occur at very low levels, as described by the 58 current and former fishers interviewed during TCOT SEQ. Table 9.13 gives an overview of incidental catch in TCI.

Most (86.2%) of the current and former fishers said that they did not incur incidental catch of turtles, while 7 current and 1 former fisher (13.8%) said they did. Of these, 5 accidentally catch turtles on hook and line and 3 catch them in gill nets set for bonefish. All 8 fishers report that incidentally caught turtles are usually found alive, whether in nets or on a hook and line, with 5 reporting that they either sell or use the turtles they catch. Incidental catch levels appear to be low, but this is consistent with fishing methods used to catch

conch and lobster, (i.e. diving and capture by hand or by hook). The level of current regular catch (reported by only 5 of these fishers) ranges from 1 to 12 turtles per year with a mean of about 3.5 turtles per year. The TCOT SEQ current fisherman sample represents 9.2% of the fishers licensed in TCI 2003. If the level of bycatch is representative of TCI's fishers as a whole, then annual bycatch of turtles in TCI may be at least 190 turtles per year. As can be seen in Table 9.12, most incidentally caught turtles are used and most respondents thought that other fishers would use any turtle they accidentally caught.

One fisher's recent encounter with an incidentally caught turtle is of particular interest. He snagged a hawksbill turtle 'of about 40lbs' on a bonefish line while fishing in a tidal creek

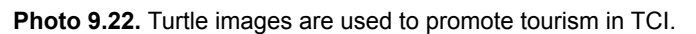
Recommendations

9.1.2.1. Amend harvest legislation

c) *Establish a limited turtle fishing licensing scheme, whereby licensed turtle fishers agree to abide by strict regulations regarding fishery practice, limited quotas and catch recording, including statutory monthly catch reporting by fishers to DECR (including incidental catch), and voluntary reporting of all turtles caught in advance of slaughter for biometric measurement and sampling by DECR. Quotas should be reactive and based on number of licensed turtle fishers and stock assessments established through the monitoring regimes. The DECR should have the statutory power to implement spot checks at fish landing sites to assess compliance and to close the fishery if stock monitoring reveals abundance declines below a pre-established and measurable level.*

9.1.3.2. Establish systematic monitoring efforts at index foraging sites

b) *Expand the sampling regime initiated under TCOT to establish the genetic 'identity' of TCI's nesting and foraging populations. This sampling could be included as part of the surveys mentioned above and fishers participation should be encouraged where practicable. Sampling should be extensive and should include an assessment of the prevalence of fibropapilloma (FP) in the foraging, and if possible, nesting turtle populations.*



The main indirect uses of turtles in TCI include dive/snorkel tours and the sale of turtle related merchandise in tourist gift shops. The Protected Areas Department also used photographs of hawksbill turtles in a leaflet promoting TCI's national parks (*Welcome to the Turks & Caicos Islands – "Beautiful by Nature"*) and a promotional leaflet entitled *Enjoy the National Parks of Grand Turk and Salt Cay*. The Turtle Cove Inn in Providenciales uses a stylised turtle image as a logo and the names of some private residences on Providenciales refer to turtles.

Turtle nesting activity appears to be restricted to remote cays and therefore turtle-watching on beaches is unlikely to be viable as mainstream tourist activity.

Dive tourism is a significant business in TCI, with approximately 20 operators based in Providenciales (n=13), Grand Turk (n=3), Salt Cay (n=3) and North Caicos (n=1). At least 5 of these operators use photographs of hawksbill turtles in their promotional leaflets. Some of the larger dive operators also run boat trips and snorkel tours for tourists, and TCOT SEQ identified 3 individuals (2 fishers and 1 restaurant owner) who ran private boat trips including snorkel tours. One of the fishers catches turtles for consumption, but during TCOT surveys, expressed a reluctance to fish for

Advertising	Attraction	Professional
<i>Turtles are used as a way of promoting a service</i>	<i>Customers may see live turtles or buy turtle merchandise</i>	<i>Involvement in marine turtle research, conservation and education</i>
1 recreational fishing charter company	4 boat tour operators (incl. 1 former operator)	2 DECR employees
6 (of 10) dive operators	9 (of 10) dive operators 3 gift shops	
7 (35%)	16 (80%)	2 (10%)

Mean percentages of customer categories for the commercial indirect users (n=18, not incl. DECR)

Local	Expat	Tourist
4.1	8.4	87.3

Table 9.14. Summary of indirect turtle users identified during TCOT SEQ (n=20).

turtles when running snorkel trips because *‘they don’t like to see it’*. He would occasionally catch a turtle to show to his customers and then release it.

9.8.3. Aquaria holding captive turtles

There are no such facilities in the TCI other than the laboratory aquarium at the DECR office on South Caicos that was used to house some of the turtles captured by fishers specifically for TCOT tagging and sampling.

9.8.4. Gift Shops

There are several gift shops around the TCI, but most are found on Providenciales. Employees of 3 gift shops were interviewed during TCOT SEQ and the shops sold significant quantities of merchandise featuring turtle images, including t-shirts, key rings, fridge magnets, caps, towels, cuddly toys and games (PIC).

9.8.5. Data from the TCOT SEQ

Table 9.14 gives an overview of the indirect turtle users identified by TCOT SEQ. Nineteen current and 1 former indirect users answered questions about their use/ involvement with turtles during TCOT SEQ, with the majority using turtles as an attraction for tourists, either as live animals in the wild or as merchandise using turtle imagery.

When asked the question, would you still use/be involved with turtles if they were no longer found in TCI, 8 (40%) said yes and 9 (45%) said no, while 3 did not answer the question. Ten (50%) respondents said that their services would stay the same if turtles were no longer found in TCI, whereas 8 (40%) said that their services would decrease. One (DECR) respondent said their services would increase (more research to investigate cause) if turtles were no longer found in TCI and the question was not applicable to the former boat trip operator. While these results suggest that the services of these indirect users are not dependent on the presence of turtles in TCI, 8 (40%) said that turtles

were very important to their services, 7 (35%) said they were somewhat important and 4 (20%) said they were unimportant, while the question was not applicable to the former boat trip operator.

The majority of these users therefore perceive turtles as important to their services. Nine out the 10 dive operators said that their customers are generally excited when they see turtles on the dive, with 2 operators comparing tourist interest in turtles to other large marine animals they might see, such as sharks and eagle rays. All 3 gift shop owners/ managers said that their customers buy merchandise with turtle images because they associate turtles with the TCI, often because they have encountered turtles while snorkelling. One Providenciales gift shop owner directs her tourist customers to ‘Coral Gardens’, a snorkelling site in Princess Alexandra National Park, where juvenile green turtles and occasionally hawksbills are often encountered. She said that these tourists usually return to her shop to thank her and often buy turtle-related merchandise *‘as a conversational piece back home’*.

9.9. Attitudes to conservation

TCOT SEQ sought to assess overall attitudes towards conservation of marine turtles, and options for marine turtle management. Respondents could agree, disagree, or have no opinion. In some cases, they could choose ‘not applicable’. While details of responses to these questions have been circulated to project partners in TCI, basic results are summarized here. The most common response is cited. In general, most respondents agreed that:

- It is important that sea turtles exist in the wild in the future (96.7%)
- Turtles are culturally valuable in this TCI (88%)
- Turtles should be protected, regardless of their use to humans (87%)
- The government needs to actively work to protect sea turtles (85.9%)

- Turtles play an important ecological role in our natural environment (85.9%)
- Some income from tourism should be used to support sea turtle conservation (84.8%)
- As turtles are migratory, they should be managed in cooperation with neighbouring states (84.8%)
- Local people should be allowed to catch and eat sea turtles, provided it doesn't threaten the regional population (80.4%)
- Turtles are an economically valuable resource in TCI (78.3%)
- Turtles should be used both as a tourist attraction and as a source of food (70.7%)
- Local people should be allowed to purchase sea turtle meat (70.7%)
- The government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced (68.5%)

There was less agreement among the interviewees regarding the following statements:

- Turtles should be used as a tourist attraction rather than as a source of food (47.8% agree, 39.1% disagree)
- Turtle fishing should be stopped until more information is known on the size and health of the populations (44.6% disagree, 42.4% agree)
- Existing laws protecting marine turtles are effectively

enforced (40.2% agree, 30.4% disagree)

- Tourists should be allowed to purchase sea turtle meat (51.1% agree, 42.4% disagree)

A majority of respondents disagreed that:

- Turtle fishing should be stopped completely (67.4%)
- Turtle fishing should be unregulated (65.2%)
- Tourists should be allowed to purchase sea turtle shell and take it home with them (52.2%)

These results suggest that marine turtles are considered to be ecologically and culturally important to the TCI and, therefore, there is wide support for marine turtle use, both direct and indirect, and turtle conservation in Turks and Caicos Islands. There is particularly high support for general 'feel good' statements (e.g. *It is important that sea turtles exist in the wild in the future*), and wide acceptance of the role of government in turtle conservation.

More contentious are statements related to the effectiveness of current enforcement efforts, management options to assess turtle populations and the role of tourism in the local marine turtle product trade. This was reflected by the fact that over 50% of interviewees were opposed to the sale of turtle shell souvenirs to tourists. The majority of interviewees did not feel that turtle fishing should be stopped completely but felt that some regulation of the fishery is necessary.



Photo 9.23. Turtle merchandise for sale in a gift shop in Providenciales (Photo P. Richardson).



Photo 9.24. South Caicos fisher with a hawksbill turtle caught, tagged and released within the Ramsar site (Photo P. Richardson).

9.10. Capacity Building and Outreach Activities During TCOT

9.10.1. Capacity building

In September 2002, DECR officers Jasmine Parker and Amber Thomas attended the TCOT training workshop in the Cayman Islands, and Jasmine attended the Bermuda Turtle Project In-water course in August 2003 with support from the Foreign and Commonwealth Office. In addition, other DECR officers have been closely involved in some TCOT fieldwork and local fishers were involved in TCOT sampling at every opportunity. The capacity of the DECR staff to carry out marine turtle monitoring has been significantly improved through the TCOT project, but Amber Thomas has since left the DECR and therefore there is a need for further capacity building within the DECR and PAD with respect to marine turtle conservation and management.

9.10.2. Outreach activities

TCOT staff did not carry out any dedicated outreach activities during field visits, apart from one public presentation about turtles in TCI and TCOT that was held in September 2003 at the new Environmental Centre, Providenciales. TCOT also produced an informational leaflet entitled '*Turtles and Tourism: how you can help*', which was distributed at tourist centres throughout Providenciales and Grand Turk. Amber Thomas, formerly of DECR, carried out some educational activities with South Caicos school children, which often involved them visiting the DECR aquarium to view the turtles temporarily held captive there.

Recommendations

9.1.4.2. Implement general awareness programmes regarding marine turtle conservation in the Turks and Caicos Islands

- a) *Raise awareness among residents of the presence in TCI of distinct foraging and nesting turtle populations that contribute to the regional turtle populations, through informational materials and media outputs.*
- b) *Establish a programme of stakeholder meetings to raise awareness of marine turtle biology (including presence of distinct foraging and nesting populations), turtle and habitat conservation needs, national legislation and MEA's.*
- c) *Establish a programme of awareness raising presentations and workshops in fishing communities, schools and other public fora.*
- d) *Establish a programme of awareness raising presentations and workshops to sensitise the tourism industry to the potential impacts of tourism and possible mitigation measures.*
- e) *Develop the TCI National Trust conservation awareness programmes to include curriculum-*

linked, multi-media marine turtle related educational materials, and expand these programmes to include all schools, with those located in key fishing communities in TCI, as priority.

9.1.1.1. Increase the capacity of the Department of Environment and Coastal Resources (DECOR) and the Protected Areas Department (PAD)

- a) *Ensure DECR/PAD has the capacity, staff and resources to carry out enforcement and monitoring duties relevant to marine turtle management, including data collection, entry, management and analysis for turtle monitoring programmes. Given the importance of all natural resources in the network of Protected Areas, and apparent poor compliance with the National Parks Ordinance, TCOT recommends that an increased capacity to effectively patrol the protected areas should be treated as a priority.*
- b) *It is recommended that national and international funding is sourced to support further capacity-building, as well as dedicated marine turtle population monitoring, turtle genetic sampling, turtle fishery monitoring and turtle conservation awareness and outreach programmes.*
- c) *Ensure that all new research and conservation staff are adequately trained in marine turtle biology, as well as research and conservation techniques.*

Additionally, we make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

9.11. Acknowledgements

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Towards a Molecular Profile of Marine Turtles in the Caribbean Overseas Territories





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The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

10. Towards a Molecular Profile of Marine Turtles in the Caribbean Overseas Territories.

Contents	Page
10.1. Summary and Recommendations	224
10.2. Introduction to the Use of Molecular Markers in Marine Turtles	224-225
10.3. Background to Analyses Within TCOT	225
10.4. Samples from Anguilla, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos Islands	225-229
10.4.1. Methodology	225-226
10.4.2. Anguilla	226
10.4.3. British Virgin Islands	226
10.4.4. Cayman Islands	227
10.4.5. Montserrat	227
10.4.6. Turks and Caicos Islands	228
10.4.7. Overview	228-229
10.5. Samples from Bermuda	229-230
10.5.1. Introduction	229
10.5.2. Green turtles	229
10.5.3. Hawksbill turtles	229
10.5.4. Loggerhead turtles	229-230
10.6. Acknowledgements	230
10.7. References	230-231
Tables 10.2-10.17	232-236

10.1. Summary and Recommendations

Summary

The genetics component of TCOT involved collection of genetic samples on a vast scale from nesting and feeding populations of green turtles (*Chelonia mydas*), hawksbills (*Eretmochelys imbricata*), loggerheads (*Caretta caretta*) and leatherbacks (*Dermochelys coriacea*) from Anguilla, the British Virgin Islands, the Cayman Islands, Montserrat and the Turks and Caicos Islands. A total of 383 samples were successfully analysed (following 530 analysis runs), including 112 from nesting females/hatchlings and 271 from foraging turtles. A fragment of the mitochondrial DNA control region was sequenced and the haplotype of each sample was determined through alignment against known sequences.

Hawksbill nesting populations in Anguilla, the British Virgin Islands (BVI), Montserrat, and Turks and Caicos (TCI) were described for the first time, and were found to exhibit six different haplotypes, two of which were previously undescribed. In the Cayman Islands we found 7 haplotypes among the Cayman Turtle Farm green turtle breeding population, and 3 among the wild nesting population. The loggerhead nesting population in the Cayman Islands exhibited 2 known haplotypes and one new one. The feeding green turtle populations at all TCOT sites combined exhibited a total of 9 different haplotypes, including two previously undescribed. The hawksbill feeding populations exhibited 14 haplotypes, 4 previously undescribed.

We compared our results with haplotype distributions for nesting and foraging ground populations in the Caribbean region and the Atlantic Ocean basin to attempt to establish possible qualitative links between sites. An overview is also presented regarding additional green turtle, hawksbill and loggerhead samples from Bermuda that have been collected by the Bermuda Turtle Project and analysed by Dr. Peter Meylan of Eckert College, USA.

A total of 446 samples are still pending analysis from Anguilla, BVI, Cayman, Montserrat and TCI. Leatherback sample analysis will be carried out in the near future in collaboration with the Dr. Peter Dutton of the Southwest Fisheries Science Center, USA.

Recommendations

10.1.1. It is recommended that sample sizes for both nesting and feeding populations are increased at all sites.

In the IUCN MTSG Techniques Manual (1999) Fitzsimmons *et al.* recommended that: “Sampling sizes for mixed stock assessment depend on the number of candidate source populations and the level of differentiation between nesting colonies. A typical feeding ground population should include at least 100 individuals.” Given the low genetic variability observed among certain species (such as green turtles, for example) we recommend that feeding ground studies should attempt to maximise sample sizes, to include as

many as 200 individuals wherever possible. Samples of foraging populations can be part of ongoing inwater monitoring/research protocols but should also be part of the recording process, which we highly recommend as part of all remaining marine turtle fisheries.

10.1.2. We recommend that as many as possible of the potentially contributing rookeries in the region be described and their level of differentiation be carefully assessed.

Baseline rookery descriptions for mixed stock assessments should be based on larger sample sizes than what has been available to date for most populations. In addition, we recommend that a concerted effort be made to sample the greatest possible number of potentially contributing baseline rookeries worldwide. For nesting rookeries in the Caribbean OT's which are all critically reduced, sampling will be limited to as many possible individuals that can be accessed in the population, with the acknowledgement that this will confound the likelihood of finding definitive answers as to which foraging grounds are used by the remnant populations nesting in the Caribbean OT's.

10.1.3. International coordination should be strengthened.

In order for the genetic results to be applied most effectively in management and conservation efforts of regional marine turtle populations a regional view must be taken. Coordinated international efforts in conservation are essential in the management of such migratory species. Through a better understanding of distribution and migratory behaviour of sea turtle populations provided through genetic studies, management strategies will be more targeted and efficient in future.

10.2. Introduction to the Use of Molecular Markers in Marine Turtles

Habitat use, philopatry, mating behaviour and migratory patterns play an important role in determining population structure, and molecular techniques have proved effective in gaining insights in these behaviours so difficult to observe in sea turtles (Allard *et al.* 1994; Bass *et al.* 1996; Bowen *et al.* 1995; Bowen *et al.* 1996; Dutton 1996; FitzSimmons *et al.* 1997; Karl *et al.* 1992; Meylan *et al.* 1990; Norman *et al.* 1994). Sea turtles maintain fidelity to the nesting site of birth (natal homing), which leads to strong genetic differentiation of nesting populations over time (Meylan *et al.* 1990). This variability can be detected via sequencing of the fast-evolving mitochondrial DNA (mtDNA) control region, that can provide levels of resolution appropriate to phylogeographic studies based on matrilineal inheritance (Bowen *et al.* 1992; Encalada *et al.* 1996; Lahanas *et al.* 1994; Lahanas *et al.* 1998).

In addition, mitochondrial DNA polymorphisms can be used as genetic markers, linking turtles in genetically-mixed foraging aggregations to their nesting beach origins. Recent genetic studies have demonstrated that hawksbills and green turtles recruit to foraging grounds from multiple

nesting beaches (Bass *et al.* 1996; Bass 1999; Bowen *et al.* 1996). This implies that foraging aggregations may originate from nesting beaches in a range of jurisdictions. Without knowledge of migratory patterns, the effects of threats on nesting beaches, foraging grounds, and migratory corridors cannot be evaluated for populations (Bowen 1995).

Genetic studies are key to unravelling the fundamentals of marine turtle distribution and population dynamics. Studies in the Atlantic involving or focussing on the Caribbean have been undertaken or are underway on hawksbill turtles (Bass 1999; Bass *et al.* 1996; Diaz-Fernandez *et al.* 1999; Engstrom *et al.* 2002), green turtles (Bass & Witzell 2000; Bowen *et al.* 1992; Encalada *et al.* 1996; Lahanas *et al.* 1994; Lahanas *et al.* 1998), loggerhead turtles (Bowen *et al.* 1994; Encalada *et al.* 1998; Engstrom *et al.* 2002) and leatherback turtles (Dutton 1999).

10.3. Background to Analyses within TCOT

At the time of the TCOT project launch, work was already underway in Bermuda and Cayman. This led to TCOT molecular work on hardshelled sea turtles being carried out in 3 ways.

1. Samples from **Anguilla, British Virgin Islands, Montserrat and Turks and Caicos Islands** were analysed by Dr. Angela Formia and Prof. Mike Bruford at Cardiff University (CU).
2. Samples from the **Cayman Islands** were already subject to a preliminary investigation by Janice Blumenthal (then Eckerd College, USA) and Dr. Peter Meylan (Eckerd College and Bermuda Turtle Project). This work was extended greatly and additional analyses were carried out by J. Blumenthal at CU under the supervision of Dr. Formia and Prof. Bruford as part of TCOT.
3. Samples from **Bermuda** have already been subject to extensive and ongoing analysis by Dr. Peter Meylan and colleagues. They opted to continue working independently but have kindly contributed a section to this report for the sake of completeness.
4. **Leatherback turtle samples** have been routed to Peter Dutton of the US National Marine Fisheries Service, Southwest Fisheries Science Centre, La Jolla California, USA. Samples will be analysed as part of PD's global leatherback genetics project. Samples and data will be stored or repatriated to OT partners upon request. Ten leatherback samples collected in Anguilla (6) and BVI (4) from nesting females have yet to be analysed.

Here we summarise the sampling and analysis, which have been undertaken to date and we give an intimation of the level of data likely to be available in the near future. Possible qualitative links are given but should be treated with great caution as not all possible links are likely and increased

sampling will be needed to allow maximum likelihood and bayesian analyses of the relative contributions of different source populations to foraging areas. Sampling during TCOT has exceeded expectations and we already have an excess of samples in hand. Additional funds have been given by Defra to run an additional 200 samples in FY 2004/05. It is expected that by Spring 2005, we will be closer to giving more quantitative answers regarding possible linkages between nesting populations and foraging grounds/harvests.

Rigorously analysed results will subsequently be made available in the peer-reviewed literature in scientific publication authored by key personnel in the UK and UK OTs. Please contact Angela Formia <formiaa@cardiff.ac.uk> for updates regarding TCOT genetics other than for Bermuda. For Bermuda we refer interested parties to Peter Meylan <meylanpa@eckerd.edu>.



Photo 10.1. Taking a tissue sample from a juvenile hawksbill turtle (Photo CIDoE).

10.4. Samples from Anguilla, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos Islands

(Text contributed by Angela Formia and Janice Blumenthal)

10.4.1. Methodology

Samples were collected from a wide variety of sources, such as nesting females, hatchlings recovered from nests, animals captured as part of turtle fisheries, dead strandings of whole individuals or old carapaces, and uncooked meat in restaurants. Each sample consisted of a tissue biopsy

		Anguilla	BVI	Cayman	Montserrat	TCI	Total
Nesting Samples	Farmed Green	0(0)	0(0)	48(52)	0(0)	0(0)	48(52)
	Wild Green	0(0)	0(0)	4(51)	0(3)	0(0)	4(54)
	Hawksbill	2(2)	2(2)	0(0)	3(4)	1(1)	8(9)
	Loggerhead	0(0)	0(0)	48(69)	0(0)	0(0)	48(69)
	Hybrid	0(0)	0(0)	4(4)	0(0)	0(0)	4(4)
	Subtotal	2(2)	2(2)	104(176)	3(7)	1(1)	112(188)
Foraging/Harvest	Green	16(16)	21(23)	0(0)	2(8)	17(18)	56(65)
	Hawksbill	4(5)	66(68)	103(149)	4(9)	38(46)	217(279)
	Loggerhead	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
	Subtotal	20(21)	87(91)	103(149)	6(17)	55(64)	271(342)
Total		22(23)	89(93)	207(325)	9(24)	56(65)	383(530)

Table 10.1. The number of samples successfully analysed as part of TCOT. (Numbers in parentheses are the number of sample analysis runs that were undertaken to obtain data).

(skin whenever available), approximately 5 mm in diameter, taken from the neck or flipper and causing minimal disturbance to live animals. All samples were stored at ambient temperature in 20% w/v DMSO in saturated NaCl.

Samples were collected by a network of researchers and field assistants throughout the study area, and posted (with all appropriate CITES permits) to Cardiff University for laboratory analysis. A total of 530 sample runs were carried out in Cardiff between the project start date and March 2004, yielding data for 383 samples (i.e. pieces of tissue), including 89 from BVI, 9 from Montserrat, 56 from TCI, 22 from Anguilla, and 207 from Cayman (see below regarding analysis failure rates). Additional sampling is ongoing, as we continue to build up the sample size available. Mixed stock analyses and population assignment tests will be carried out upon completion of all field-work and laboratory analysis.

DNA was extracted from each sample according to standard protocols (Allen *et al.* 1998; Milligan 1998). A fragment of the mtDNA was amplified using Polymerase Chain Reaction (PCR) and specific primers for each species: LTCM1 and HDCM1 for green turtles (Allard *et al.* 1994), TCR5 and TCR6 for loggerheads (Norman *et al.* 1994) and LTEI9 and H950 for hawksbills (Abreu-Grobois, unpublished). The fragments obtained varied in length between approximately 400 and 850 base pairs. Negative controls were used to test for contamination. PCR products were cleaned and sequenced in both directions using Big Dye Terminator chemistry (Applied Biosystems) and analysed with an automatic sequencer. Sequences were then aligned and edited using appropriate software and matched against previously published haplotypes. Any new haplotypes were assigned a preliminary nomenclature with the initials TCOT. Haplotype designations for green turtles and loggerheads were based on identifications summarised at <http://accstr.ufl.edu/genetics.html>. Hawksbill designations were assigned based on a haplotype classification by Abreu-Grobois. Where previously published haplotypes were based on shorter fragments than those amplified during this

study, we indicate the old nomenclature in brackets below. Resequencing of these shorter haplotypes is in progress and we refer interested parties to Abreu-Grobois at <alberto.abreu@ola.icmyl.unam.mx>. Hawksbill haplotype designations presented here are, therefore, preliminary and possible nomenclature errors will be investigated and addressed as part of the full analysis of the TCOT genetic sample base.

10.4.2. Anguilla

i) Green turtle (see table 10.2)

Nesting

Samples tried: 0
Data generated: 0
Samples pending: 0

Foraging

Samples tried: 16
Data generated: 16
Samples pending: 35

ii) Hawksbill turtle (see tables 10.3 and 10.4)

Nesting

Samples tried: 2
Data generated: 2
Samples pending: 0

Foraging

Samples tried: 5
Data generated: 4
Samples pending: 17

10.4.3. British Virgin Islands

i) Green turtle (see table 10.5)

Nesting

Samples tried: 0
Data generated: 0
Samples pending: 0

Foraging

Samples tried: 23
Data generated: 21
Samples pending: 35

ii) Hawksbill turtle (see tables 10.6 and 10.7)

Nesting

Samples tried: 2
Data generated: 2
Samples pending: 1

Foraging

Samples tried: 68
Data generated: 66
Samples pending: 60

10.4.4. Cayman Islands

i) Green turtle (see tables 10.8 and 10.9)

The Cayman Turtle Farm was established in 1968, and has released over 30,000 headstarted turtles into Cayman waters. Recent papers document the long-term survival and reproductive contributions of turtle farm releases (Bell & Parsons 2002; Bell *et al.* submitted; Wood & Wood 1993). An assessment of genetic identity is necessary in order to evaluate impacts of releasing farmed turtles on wild populations, with additional relevance to issues of captive breeding and reintroduction of endangered species.

Farm Turtles

Samples tried: 52

Data generated: 48

Samples pending: 91

*(Failed samples were degraded tissue collected from dead, non-emergent hatchlings and embryos).

Wild nesting population

Samples tried: 51

Data generated: 4*

Samples pending: 85

Foraging

Partners in the Cayman Islands are approaching collection of sufficient samples to accurately characterize origins of foraging green turtles in the Cayman Islands. TCOT has facilitated collection of genetic samples in the Cayman Islands, and continued funding will permit sequencing of these samples in hand. A total of 35 foraging samples are in hand, but yet to be analysed.

ii) Hawksbill turtle (see table 10.10)

Nesting

Hawksbill nesting is reported in historical accounts (Lewis 1940) and Wood & Wood (1994) and Aiken *et al.* (2001) documented several occurrences of hawksbill nesting. However, hawksbill nesting has not been recorded in 2001-2004, and is now believed to have been extirpated (C. Bell (CIDoE) pers. comm. 2004).

Foraging

Samples tried: 149

Samples completed: 103

Samples pending: 58

iii) Loggerhead turtle (see table 10.11)

Nesting

Samples tried: 69

Samples completed: 48

Samples pending: 53

iv) Hybrid samples

Early anecdotal accounts of hybrid turtles were collected in Cayman and summarized in Lewis (1940), though in recent years, Carr (1967) and Wood & Wood (1994) found no evidence hybridization in the Cayman Islands. However, in 2002, the Cayman Islands Department of Environment documented two nests on Seven Mile Beach, from which

hatchlings displayed intermediate diagnostic morphological characteristics (variable numbers of prefrontal scales and lateral scutes). Based on morphological evidence, these hatchlings were believed to be *Chelonia mydas* x *Caretta caretta* hybrids. Sequencing of the mitochondrial DNA control region revealed *Caretta caretta* mtDNA sequences, while identity of the male parent awaits confirmation via analysis of single-copy nuclear (scn) DNA markers. Additionally, a juvenile, believed to be *Eretmochelys imbricata* x *Caretta caretta* based on intermediate morphological characteristics was sampled by the Department of Environment in 2002. Sequencing revealed a mitochondrial DNA sequence typical of *Caretta caretta*. Previously, *Chelonia mydas* x *Caretta caretta* hybrids have been documented in Australia, Japan, and Brazil, while *Eretmochelys imbricata* x *Caretta caretta* hybrids have been documented in Japan, Brazil, and the USA (references reviewed in Seminoff *et al.* 2003).

10.4.5. Montserrat

i) Green turtle (see table 10.12)

Nesting

Samples tried: 3

Data generated: 0

Samples pending: 0

Foraging

Samples tried: 8

Data generated: 2

Samples pending: 0

ii) Hawksbill turtle (see table 10.13 and 10.14)

Nesting

Samples tried: 4

Data generated: 3

Samples pending: 0

Foraging

Samples tried: 6

Data generated: 4

Samples pending: 0

Three additional samples collected in Montserrat failed to amplify and species identification could not be confirmed. Overall, the 15 failed samples from Montserrat were taken from poor quality tissue, 9 from dead and decayed hatchlings and 2 from dead stranded adults. DNA fragments of sufficient size and quality could not be amplified despite attempting several extraction and PCR protocol variations.



Photo 10.2. Juveniles gathered from foraging sites for tissue sampling (Photo P. Richardson).

10.4.6. Turks and Caicos Islands

i) Green turtle (see table 10.15)

Nesting

Samples tried: 0
Data generated: 0
Samples pending: 0

Foraging

Samples tried: 18
Data generated: 17
Samples pending: 0

ii) Hawksbill turtle (see table 10.16)

Nesting

Samples tried: 1
Data generated: 1
Samples pending: 0

Foraging

Samples tried: 46
Data generated: 38*
Samples pending: 0

*(The 8 failed samples were taken from poor quality tissue, including the inner surface of carapaces and deteriorated muscle tissue; DNA fragments of sufficient size and quality could not be extracted).

10.4.7. Overview

Green turtles

Green turtle foraging samples from Anguilla, BVI, Montserrat and TCI have revealed two previously undescribed haplotypes (TCOT1 and TCOT2). Additional samples are available from individuals at Cayman, BVI, Anguilla and TCI foraging grounds, which will be analysed in future. The haplotypes exhibited by foraging individuals at all sampled sites, except Montserrat, belonged to two different and divergent haplotype groups, one which is common in the southern Caribbean and southern Atlantic rookeries (such as Suriname, Venezuela, Ascension, Guinea Bissau, Bioko, Sao Tome, Principe and Brazil), and one which is common in Mexico, Florida and Costa Rica rookeries. In other words, due to the presence of haplotypes CMA-5, CMA-8 and CMA-32 at one or several of the feeding sites analysed, we cannot exclude that rookeries in the southern Caribbean and southern Atlantic may be contributing to our Caribbean mixed aggregates, in addition to rookeries such as Tortuguero, Mexico and Florida which appear to contribute a majority of the haplotypes. Mixed stock analysis will be used to resolve the feeding stock composition based on best available data for rookery characteristics.

Vice versa, the presence of nesting haplotypes such as CMA-5 and CMA-8 in West African foraging grounds (Formia 2002) indicates that the gene flow may be occurring in both directions. In other words, rookeries in the western Atlantic such as Ascension, Suriname, Venezuela, Mexico and Brazil may be contributing individuals to African mixed stocks. It is indeed possible that future analysis of nesting green turtles in the TCOT study area may also show links with African feeding grounds.

Although green turtle rookeries throughout the Atlantic have been genetically described in several studies (Allard *et al.* 1994; Encalada *et al.* 1996; Lahanas *et al.* 1994; Lahanas *et al.* 1998), these data are currently being extended and

detailed by a number of research groups. All additional nesting samples obtained at our Caribbean study sites will be valuable contributions to understanding the overall haplotype distribution of nesting populations, and thus to correctly assigning individuals at sea to their respective rookeries of origin.

Hawksbill turtle

Insufficient data are available on the haplotype composition of hawksbill turtle rookeries found in the eastern Atlantic. It is therefore not possible, at present, to assess any potential contribution from these rookeries to mixed aggregates. None of the haplotypes found in Caribbean feeding grounds or rookeries appear to belong to highly divergent haplogroups, although hawksbill haplotypes generally exhibit greater variability than green turtles (i.e. distribution not consisting of few common and many rare haplotypes).

To date, we have analysed nesting individuals from four previously unstudied hawksbill rookeries (Anguilla, BVI, TCI and Montserrat). Among these we have identified 2 previously undescribed haplotypes (TCOT3 and TCOT6). However, it must be noted that they are both equivalent to haplotype EiA011, as designated by A. Abreu-Grobois (pers. comm. 2004). However, EiA011, like many other hawksbill haplotypes, was identified based on a much shorter sequence (approximately 500 bp) than that analysed here, not including the region where TCOT3 and 6 are differentiated. Thus, we maintained here the TCOT designations until the matter can be resolved by re-sequencing of the original EiA011 samples.

We have also found 5 haplotypes previously undescribed among foraging hawksbills (TCOT3, TCOT4, TCOT5, TCOT6, TCOT7). TCOT4, TCOT5 and TCOT7 have not yet been found among known rookeries, which may be explained by small sample sizes for sampled rookeries and/or unsampled nesting sites. Unfortunately, sample sizes available are not yet sufficient to provide accurate haplotype distributions of the nesting populations at our four study sites. Statistically significant assessments of the origin of



Photo 10.3. Genetics sampling, Tortola, BVI (Photo B. Godley).

individuals in foraging grounds and harvests are contingent on thorough descriptions of potentially contributing baseline rookeries and on extended sequencing of known haplotypes to include longer fragments.

Loggerhead Turtle

Only the Cayman Islands have a notable loggerhead nesting population, although nesting is suspected by this species elsewhere in the TCOT range. The presence of loggerhead haplotypes, which may be unique to nesting beaches in the Cayman Islands, indicates that knowledge of genetic diversity in the Atlantic is incomplete for the species, and highlights the need for future research. Genetic diversity of small nesting beach populations is vulnerable due to exploitation both on nesting beaches and on foraging grounds overseas. However, the impacts of that exploitation cannot be assessed until genetic surveys are completed for small rookeries. Continued research on critically reduced populations such as the Cayman Islands will contribute to a crucial evaluation of loggerhead genetic diversity in the Caribbean.

(End of Section by Formia/Blumenthal)

10.5. Samples from Bermuda

Peter Meylan, Anne Meylan and Jennifer Gray of the Bermuda Turtle Project write:

10.5.1. Introduction

Blood or tissue samples of green turtles, hawksbills and loggerheads from Bermuda have been studied by the Bermuda Turtle Project. Preliminary results on green turtles (Engstrom *et al.* 1998) and hawksbills (Meylan *et al.* 2004) have been presented at the International Symposia on Sea Turtle Biology and Conservation. In all cases, published control region primers have been used to amplify sequences of approximately 550bp. In most cases, a sequence was generated in one direction and aligned with a published sequence for confirmation. Most of the green turtle samples were initially processed by students in Eckerd College genetics classes. These students isolated and amplified DNA from a small subsample of blood or tissue. They then cleaned the PCR product which was sent to the BEECS lab at the University of Florida for sequencing. Edited sequences were returned from UF and aligned by students who made the initial haplotype determination. Haplotype determinations were confirmed before being added to the database. Hawksbill and loggerhead samples were processed entirely by the BEECS lab.

10.5.2. Green turtles

As of December 2003, 1222 genetics samples from Bermuda green turtles have been collected. Control region sequences are now available for 128 of these, with about 30 more in various stages of completion. Among the sequenced samples are at least 10 different genotypes, seven of which match published haplotypes and three of which have not been published to our knowledge. These haplotypes represent, at a minimum, contributions from

three different nesting beaches, but may represent all eight of the major green turtle nesting aggregations in the Atlantic (not including Mediterranean). Just over one hundred of these sequences represent a random sample from the available genetic material collected by the Bermuda Turtle Project. They are being used to estimate stock contribution to the green turtle aggregation in Bermuda. The remaining samples were not chosen at random but instead were selected for sequencing after we learned of an individual turtle's capture in another country. These samples, which are presumed to represent the various feeding grounds of the population, have been processed to test for patterns of dispersal from Bermuda that may be explained by genotype. Because they were not selected at random, they are not used in the mixed stock analysis.

10.5.3. Hawksbill turtles

There are now approximately 80 genetic samples of hawksbills available from Bermuda. Control region sequences have been generated for 58 turtles that were identified as hawksbills based on morphology. However, four of these have turned out to be hawksbill X loggerhead hybrids, that is, they had mitochondrial genomes of *Caretta*. Among the remaining 54 sequences, there are at least eight haplotypes. Five of these match published haplotypes from around the Caribbean, three are unpublished to our knowledge. About half of these data are from animals that were captured alive and in good health; the other half are from stranded animals.

10.5.4. Loggerhead turtles

The stranding network at the Bermuda Aquarium has made a diligent effort over the last 10 years to take genetic samples from the few loggerheads that strand in Bermuda each year. A total of 43 samples are now available. Of these, 31 have been sequenced so far; four others are in various states of completion. This relatively small sample is highly informative, containing as many different haplotypes as the larger samples of hawksbills and greens. With a sufficiently large sample size, these results will allow us to



Photo 10.4. Samples from hatched nests are also used in analyses (Photo B. Godley).



Photo 10.5. TCOT staff sample hawksbill turtle meat at a restaurant in Providenciales, TCI (Photo S Ranger).

determine the nesting beaches of origin of the contingent of post-hatchling loggerheads that are observed in Bermuda waters and/or strand on Bermuda beaches on a nearly annual basis.

(End of section by Meylan, Meylan and Gray)

10.6. Acknowledgements

The molecular analysis is one of the major endpoints of all TCOT endeavours and in some way has involved almost every member of all project partners. For this effort we are very grateful. Individuals and organisations are acknowledged in OT-specific chapters. The TCOT staff would like to acknowledge the candid and generous collaboration of Janice Blumenthal, Mike Bruford, Angela Formia, Jennifer Gray, Anne Meylan and Peter Meylan in the production of this overview of the progress to date. We acknowledge the assistance of the UK CITES management authority at Defra. Finally, many thanks to those who offered constructive peer review which greatly helped improve its clarity of reporting: Alberto Abreu-Grobois, Vin Fleming, Jennifer Gray and Peter Meylan.

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Photo 10.6. Sampling procedures being demonstrated at the TCOT Workshop, CI (Photo P. Richardson).

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Haplotype	Nesting	Foraging
CM-A1	Florida, Mexico	Bahamas, Florida, Nicaragua, Barbados, Anguilla, BVI, TCI
CM-A3	Florida, Mexico, Costa Rica, Aves	Bahamas, Florida, Barbados, Anguilla, BVI, TCI, Montserrat
CM-A5	Mexico, Aves, Suriname, Sao Tome	Bahamas, Florida, Nicaragua, Barbados, West Africa, Anguilla, BVI, TCI, Montserrat
CM-A8	Bioko, Ascension, Guinea Bissau, Sao Tome, Principe, Brazil	Anguilla, TCI, West Africa
New (TCOT1)	Not yet identified	Anguilla

Table 10.2. Green turtle haplotypes recorded in foraging grounds in Anguilla and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1996; Formia 2002; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
EIA023 (Q, MXI)	Anguilla, Mexico	Anguilla, BVI, Cuba, Mexico, Puerto Rico, TCI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat, TCI

Table 10.3 Hawksbill turtle haplotypes recorded in nesting turtles in Anguilla, and the nesting and foraging aggregations where individuals with these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
EIA001 (A, CU1)	Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, USVI	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI, CI
EIA023 (Q, MXI)	Anguilla, Mexico	Anguilla, BVI, Cuba, Mexico, Puerto Rico, TCI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat, TCI

Table 10.4. Hawksbill turtle haplotypes recorded in foraging turtles in Anguilla and the nesting and foraging aggregations where turtles with these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
CM-A1	Florida, Mexico	Anguilla, Bahamas, Barbados, BVI, Florida, Nicaragua, TCI
CM-A3	Aves, Costa Rica, Florida, Mexico	Anguilla, Bahamas, Barbados, BVI, Florida, Montserrat, TCI
CM-A5	Aves, Mexico, Sao Tome, Suriname,	Anguilla, Bahamas, Barbados, BVI, Florida, Montserrat, Nicaragua, TCI, West Africa
CM-A28	Unpublished	BVI, unpublished
CM-A32	Ascension and unpublished	BVI, unpublished
New (TCOT2)	Not yet identified	BVI

Table 10.5. Green turtle haplotypes recorded in foraging turtles in the BVI and the nesting and foraging aggregations where turtles with these marker have previously been described (Encalada *et al.* 1996; Formia 2002; Formia *et al.* unpublished-b; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
EIA009 (c, F)	Belize, BVI, Cuba, Puerto Rico, USVI	BVI, Cuba, Mexico, Puerto Rico, TCI, CI
New (TCOT6)	BVI	Not yet identified

Table 10.6. Hawksbill turtle haplotypes recorded in hatchlings/nesting turtles in the British Virgin Islands and the nesting and foraging aggregations where turtles with these markers have previously been described (Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
EIA001 (CU1, A)	Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, USVI	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI, CI
EIA002 (g, alpha)	Not yet identified	BVI, Cuba, Puerto Rico, TCI, CI
EIA009 (c, F)	Belize, BVI, Cuba, Puerto Rico, USVI	BVI, Cuba, Mexico, Puerto Rico, TCI, CI
EIA020 (PR2, N)	Puerto Rico	BVI, Cuba, Puerto Rico, TCI
EIA023 (Q, MXI)	Anguilla, Mexico	Anguilla, BVI, Cuba, Mexico, Puerto Rico, TCI
EIA024 (Q, MXII)	Mexico	BVI, Cuba, Mexico, Puerto Rico, TCI, CI
EIA029 (CU3)	Cuba	Cuba, BVI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat, TCI,
New (TCOT4)	Not yet identified	BVI
New (TCOT5)	Not yet identified	BVI

Table 10.7. Hawksbill turtle haplotypes recorded in foraging turtles in the British Virgin Islands and the nesting and foraging aggregations where turtles with these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
CM-A1	Florida, Mexico	Anguilla, Bahamas, Barbados, BVI, Florida, Nicaragua, TCI
CM-A3	Aves, Costa Rica, Florida, Mexico	Anguilla, Bahamas, Barbados, Florida, BVI, Montserrat, TCI
CM-A5	Aves, Mexico, Suriname, Sao Tome	Anguilla, Bahamas, Barbados, BVI, Florida, Montserrat, Nicaragua, West Africa
CM-A16	Mexico	TCI
CM-A17	Mexico	Barbados
Unpublished	Unpublished	

Table 10.8. Green turtle haplotypes recorded in the Cayman Turtle Farm and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1996; Formia *et al.* unpublished-b; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
CM-A1	Florida, Mexico	Bahamas, Barbados Florida, Nicaragua
CM-A3	Aves, Costa Rica, Florida, Mexico	Bahamas, Barbados Florida
Unpublished	Unpublished	Unpublished

Table 10.9. Green turtle haplotypes recorded in Cayman Islands nesting turtles/hatchlings and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1996; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
EIA001 (CU1, A)	Antigua, Barbados, Brazil Cuba, Puerto Rico, USVI	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI
EIA002 (g, alpha)	Cuba	Cuba, Puerto Rico, TCI
EIA003 (B, e)	Antigua	Mexico, Puerto Rico
EIA009 (c, F)	Cuba, Belize, Puerto Rico, USVI,	BVI, Cuba, Mexico, Puerto Rico, TCI
EIA018 (PR3, L)	Puerto Rico	Cuba, Puerto Rico
EIA024 (Q, MXII)	Mexico	BVI, Cuba, Mexico, Puerto Rico, TCI
EIA028 (b)	Not yet identified	Puerto Rico, TCI
EIA029 (CU3)	Cuba	Cuba, BVI
Unpublished	Unknown	Foraging only
New	Unknown	Cayman Islands

Table 10.10. Hawksbill turtle haplotypes recorded in foraging turtles in the Cayman Islands and the nesting and foraging aggregations where turtles with these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
B	Florida, North East FL – NC, Mexico, Greece-SE Mediterranean	Chiriqui Lagoon Panama, Eastern Atlantic
J	Mexico, Greece-SE Mediterranean	Chiriqui Lagoon Panama, Eastern Atlantic
Novel Haplotype	Cayman Islands	Not yet identified

Table 10.11. Loggerhead haplotypes recorded in nesting turtles/hatchlings in the Cayman Islands and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1998; Engstrom *et al.* 2002; Laurent *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
CM-A3	Florida, Mexico, Costa Rica, Aves	Bahamas, Florida, Barbados, Anguilla, BVI, TCI, Montserrat
CM-A5	Mexico, Aves, Suriname, Sao Tome	Bahamas, Florida, Nicaragua, Barbados, West Africa, Anguilla, BVI, TCI, Montserrat

Table 10.12. Green turtle haplotypes recorded in foraging turtles from Montserrat and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1996; Formia 2002; Formia *et al.* unpublished-b; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
EIA001 (CU1, A)	Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, USVI	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI, CI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat TCI

Table 10.13. Hawksbill turtle haplotypes recorded in nesting turtles from Montserrat and the nesting and foraging aggregations where these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
EIA001 (CU1, A)	Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, USVI	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI, CI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat TCI

Table 10.14. Hawksbill turtle haplotypes recorded in foraging turtles from Montserrat and the nesting and foraging aggregations where these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
CM-A1	Florida, Mexico	Bahamas, Florida, Nicaragua, Barbados, Anguilla, BVI, TCI
CM-A3	Aves Costa Rica, Florida, Mexico	Anguilla, Bahamas, Barbados, BVI, Florida, Montserrat, TCI
CM-A5	Aves, Mexico, Sao Tome, Suriname	Anguilla, Bahamas, Barbados, BVI, Florida, Montserrat, Nicaragua, TCI, West Africa
CM-A8	Ascension, Bioko, Brazil, Guinea Bissau, Principe, Sao Tome	Anguilla, TCI, West Africa
CM-A16	Mexico	TCI

Table 10.15. Green turtle haplotypes we recorded in foraging turtles from the Turks and Caicos Island and the nesting and foraging aggregations where turtles with these markers have previously been described (Encalada *et al.* 1996; Formia 2002; Formia *et al.* unpublished-a; Formia *et al.* unpublished-b; Lahanas *et al.* 1994; Lahanas *et al.* 1998; This Study).

Haplotype	Nesting	Foraging
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat, TCI

Table 10.16. Hawksbill turtle haplotypes recorded in hatchling/nesting turtles from the TCI and the nesting and foraging aggregations where turtles with this marker have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).

Haplotype	Nesting	Foraging
EIA001 (CU1, A)	Antigua, Barbados, Brazil, Cuba, Montserrat, Puerto Rico, USVI,	Anguilla, BVI, Cuba, Montserrat, Puerto Rico, TCI, CI
EIA002 (g, alpha)	Not yet identified	BVI, Cuba, Puerto Rico, TCI, CI
EIA003 (e, B)	Antigua	Mexico, Puerto Rico, TCI, CI
EIA009 (c, F)	Belize, BVI, Cuba, Puerto Rico, USVI	BVI, Cuba, Mexico, Puerto Rico, TCI, CI
EIA020 (PR2, N)	Puerto Rico	BVI, Cuba, Puerto Rico, TCI
EIA023 (Q, MXI)	Anguilla, Mexico	Anguilla, BVI, Cuba, Mexico, Puerto Rico, TCI
EiA024 (Q, MXII)	Mexico	BVI, Cuba, Mexico, Puerto Rico, TCI, CI
EIA028 (b)	Not yet identified	Puerto Rico, TCI, CI
New (TCOT3)	Anguilla, Montserrat, TCI	Anguilla, BVI, Montserrat, TCI
New (TCOT7)	Not yet identified	TCI

Table 10.17. Hawksbill turtle haplotypes recorded in foraging turtles from the TCI and the nesting and foraging aggregations where turtles with these markers have previously been described (A. Abreu-Grobois pers. comm. 2004; Bass *et al.* 1996; Bowen *et al.* 1996; Diaz-Fernandez 1999; This Study).





Capacity Building and Support: Essential Components of TCOT





This document is part of a larger publication and should be cited as:

Godley BJ, Broderick AC, Campbell LM, Ranger S, Richardson PB (2004) 11. Capacity Building and Support: Essential Components of TCOT. In: An Assessment of the Status and Exploitation of Marine Turtles in the UK Overseas Territories in the Wider Caribbean. pp237-247. Final Project Report for the Department of Environment Food and Rural Affairs and the Foreign and Commonwealth Office.

The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

11. Capacity Building and Support: Essential Components of TCOT

Contents

	Page
11.1. Summary	238-241
11.2. TCOT Training Workshop	241
11.3. TCOT Training Workshop CD	241
11.4. International Field Course - <i>Biology and Conservation of Sea Turtles, Bermuda 2003</i>	241-244
11.5. Additional TCOT technical and practical assistance	244-247
11.5.1. Tagging and genetics sampling equipment	244
11.5.2. Technical advice notes	244
11.5.3. TCOT datasheets	244
11.5.4. Continuous practical in-situ support	244-246
11.5.5. Regional email listserv	246
11.5.6. TCOT Bibliography	247
11.5.7. Additional grants	247
11.5.8. Dissemination of TCOT outputs	247
11.6. Acknowledgements	247
11.7. References	247

11.1. Summary

In recent years, the lack of collaborative research and monitoring of biodiversity in the UK Overseas Territories has been recognised as a serious impediment to the formation of effective conservation strategies (Oldfield & Sheppard 1997). Such strategies are particularly necessary in some Territories in order to mitigate the adverse environmental impacts of intensive development pressures. Generally, marine turtle research, conservation and management have been neglected in some UK Overseas Territories in the Caribbean and consequently little is known about many turtle populations there. While Bermuda, the British Virgin Islands, the Cayman Islands and Montserrat had initiated varying degrees of local marine turtle population monitoring and research prior to TCOT, little monitoring had occurred in Anguilla and the Turks and Caicos Islands.

From the outset, TCOT was designed to meet its objectives through collaborative research involving key project partners in each UK Overseas Territory in the Caribbean. This approach was intended to facilitate appropriate and sympathetic logistical design of local research programmes, and had the potential to leave a legacy of skills and motivation required to establish long-term monitoring of marine turtle populations. Inevitably, TCOT required a significant capacity-building element in order to introduce required knowledge and methodological skills where they were absent and to standardise existing knowledge and methodologies between the Territories. Thus, TCOT initiated a range of activities to build capacity for marine turtle conservation and management amongst the local TCOT project partners and associates.

As a result of TCOT capacity building, officers in project partner institutions carried out genetic sampling and tagging programmes independently of TCOT staff field trips in Anguilla, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands (Bermuda's sampling programme is ongoing and was not affected by TCOT capacity building). Foraging population monitoring



Photo 11.1. James Gumbs inspects tracks at Windward Point, Anguilla (Photo S. Ranger).



Photo 11.2. Sue Ranger and Lisa Campbell during TCOT SEQ in Anguilla (Photo P. Richardson).

occurred independently of TCOT staff field visits in the British Virgin Islands, Cayman Islands and the Turks and Caicos Islands, and nesting site monitoring occurred to varying degrees in Anguilla, British Virgin Islands, Cayman Islands and Montserrat (there is no nesting in Bermuda and TCOT surveys revealed nesting in the Turks and Caicos is now restricted to remote cays).

Arguably, the socio-economic survey component of the capacity building programme was least successful in terms of facilitating project partner activity independent of TCOT staff field trips, although some surveys were carried out independently of TCOT staff field visits in Bermuda, British Virgin Islands, Cayman Islands and to some extent in the Turks and Caicos Islands. However, in all Territories except Bermuda and the Cayman Islands, additional TCOT staff field visits were needed to collect the required socio-economic survey sample.

The relative failure of the socio-economic survey capacity building was due to a number of factors. First, none of the project partner officers tasked with this survey had any social science training (whereas many had previous biological training) and were therefore reluctant to take responsibility for a survey they did not fully understand. Second, there was a conflict of interests with many of the project partner officers who are professionally responsible for law enforcement. Some sections of the socio-economic



Photo 11.3. Participants of the TCOT Training Workshop (Photos P. Richardson and S. Ranger).

questionnaire solicit information from interviewees about potentially illegal activities and therefore some project partner officers were uncomfortable about soliciting this information without recourse to legal action (and their effectiveness in gathering such information from fishermen could be questioned). Indeed, in the Cayman Islands and Bermuda, where the survey was implemented without the need for intensive TCOT staff time, individuals not associated with law enforcement carried out the questionnaire surveys. Third, the socio-economic questionnaire is a long and complex document, and the survey interviews sometimes took two hours to complete. Therefore, to achieve adequate sampling, this survey had the potential to take up an enormous amount of any one project partner officer's time budget, and in most cases the project partner institutions could not afford to allocate sufficient time to the officers concerned. Regardless of these constraints, project partners participating in this component of the work undoubtedly gained skills and confidence in the work through the process. For example, while additional resources and personnel were needed to facilitate survey completion in TCI, a TCI partner was present for and often played an active role in the administration of almost all surveys conducted. Furthermore, as the survey was intended as a one-time data gathering activity, as opposed

to the biological monitoring protocols put in place, lack of success in this area of skills transfer should not impact on TCOT's legacy.

Capacity building in other research methodologies was relatively successful, and as a result of TCOT significant additional marine turtle data collection has been achieved in all the UK Overseas Territories in the Caribbean (with the exception of Bermuda). However, some project partner institutions also encountered logistical problems in allocating the relevant officers with sufficient time and resources to carry out the biological sampling and monitoring. In these cases, monitoring and sampling effort was also heavily subsidised by and dependent on TCOT staff time during their field visits. Inevitably, project partner institutions will experience some staff turnover, and already two of the project partner officers who attended the TCOT Workshop have left their positions. Nevertheless, as a result of TCOT capacity building, long-term monitoring projects have been strengthened or established in the British Virgin Islands, Cayman Islands and Montserrat and there is now significantly greater interest in establishing such programmes amongst the project partner institutions in Anguilla and the Turks and Caicos Islands.

TCOT Project Partner	Delegates
Anguilla - Department of Fisheries & Marine Resources,	James Gumbs
Bermuda - Bermuda Turtle Project	Jennifer Gray
British Virgin Islands - Department of Conservation and Fisheries	Arlington Pickering, Mervin Hastings
Cayman Islands – Cayman Islands Department of Environment	Gina Ebanks-Petrie, Timothy Austin, John Bothwell, Joni Solomon, Catherine Bell, Janice Blumenthal, Jon Clamp, Nell Beaumont (volunteer).
Cayman Islands – Cayman Islands National Trust	Matt Cottam
Cayman Islands – Cayman Turtle Farm	Ken Hydes, Joe Parsons, Jose Bodden, Michael Finelli
Montserrat - Government of Montserrat	John Jeffers
Turks and Caicos Islands – Department of Environment and Coastal Resources	Amber Thomas, Jasmine Parker
Marine Turtle Research Group , UK (TCOT Project Co-ordinator)	Brendan Godley
Marine Conservation Society , UK (TCOT Team)	Peter Richardson, Sue Ranger
Duke Marine Laboratory , USA (TCOT Team)	Lisa Campbell
Wider Caribbean Sea Turtle Conservation Network (WIDECAST) , USA	Karen Eckert

Table 11.1. Delegates of the TCOT Regional Training Workshop: Marine Turtle Research and Monitoring.

However, with further support it is conceivable that the project partner institutions in Anguilla and the Turks and Caicos Islands could establish their own marine turtle monitoring programmes. This chapter documents the capacity building initiatives that were carried out under TCOT.

11.2. TCOT Training Workshop

The initial phase of TCOT's capacity building programme commenced with the 'TCOT Regional Training Workshop: Marine Turtle Research and Monitoring' hosted by TCOT project partners the Cayman Island Department of Environment (CIDoE) and the Cayman Turtle Farm in summer 2002.



The workshop was funded by the Foreign and Commonwealth Office's Environment Fund for the Overseas Territories (EFOT) and took place between the 27th August and the 2nd September. 24 delegates attended the Workshop, with at least one representative from each of the Territories within the remit of TCOT (see table 11.1).

The workshop involved classroom discussion components covering the following areas: current status of marine turtle research in the Territories; marine turtle biology; research protocols; socio-economic questionnaire surveys; the WIDECAST tagging programme; foraging site transect methodology and project fundraising. Marine turtle nesting track identification videos, donated by the Florida Fish and Wildlife Service, were handed out to all delegates along with key publications and other materials sourced by Dr Karen Eckert of WIDECAST. WIDECAST also provided metal flipper tags and pliers, series of which were allocated to and disbursed among the delegates.

Practical sessions were held at the CIDoE, the Cayman Turtle Farm, at monitored turtle rookeries and on CIDoE research vessels covered field methodologies such as marine turtle hand-capture, tagging, measuring, genetic sampling, nest-excavation and socio-economic questionnaire interview techniques. The Cayman Turtle Farm hosted a guided tour of the Farm, explained the complexities of commercial production of marine turtles for consumption and donated the Workshop dinner and entertainment. Notes on the Workshop proceedings are included in Appendix 11.1.

11.3. TCOT Training Workshop CD

As a result of the workshop, TCOT produced resource CDs for all workshop delegates and other TCOT project partners. The content of the 2 CDs is summarised in table 11.2 below.

11.4. International Field Course - Biology and Conservation of Sea Turtles, Bermuda 2003

Each year the Bermuda Aquarium and Zoo hosts an 'In-water marine turtle biology and conservation course' in collaboration with Drs Peter and Anne Meylan as part of the Bermuda Turtle Project. Brendan Godley participated in the course in 2002 during a TCOT field visit to Bermuda, at the same time as Catherine Bell (CIDoE, Cayman Islands) and James Gumbs (DFMR, Anguilla), whose attendance was organised independently of TCOT. Consequently, the TCOT team realised the utility of the course for project partners and in 2003, designed a proposal to increase TCOT project partner attendance of the course. The proposal was submitted by MCS, with support from the 6 relevant Governor's offices, to the FCO's Environment Fund for the Overseas Territories, who agreed to fund course attendance of 5 officers from TCOT project partner institutions and Peter Richardson of the MCS. Course attendees funded by the grant are listed in table 11.3. This grant also funded Jennifer Gray's attendance of the 24th

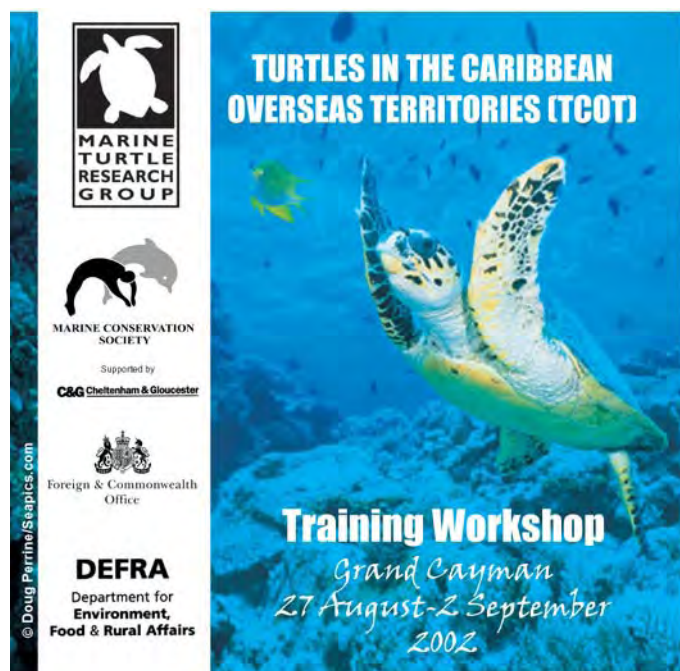


Photo 11.4. TCOT Training Workshop CDs (Photo S. Ranger).

CD1 - TCOT Workshop

1.1. General	TCOT Workshop briefing document, TCOT Workshop Proceedings Notes (incl. contact details of all participants), TCOT Participants contact list, DEFRA TCOT leaflet for CITES CoP12, WIDECAST recommendations for a regulatory framework for marine turtle management.
1.2. TCOT partner country reports	Microsoft PowerPoint presentations given at the TCOT workshop by Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos Islands.
1.3. TCOT introduction, methodology and conservation issues	Microsoft PowerPoint presentations given at the TCOT workshop including: Introduction to TCOT, Marine Turtle Biology and TCOT Methodology, Bermuda Turtle Project Net Sampling Methodology, Cayman Genetic Analysis Overview, Cayman In-water Hand Capture Methodology, Introduction to Socio-Economic Assessment, Questionnaire Explanation, Sea Turtle Project Data Management, Sea Turtles and Light Pollution, Turtle Conservation in Japan, Why Tag a Sea Turtle (WIDECAST tag programme).
1.4. Fundraising	Guidance notes, application forms and contact details for over 20 sources of funding relevant to marine turtle conservation and research in the Overseas Territories including: BP Conservation, British Airways, British Chelonia Group, Chelonia Research Foundation, Conservation, Food and Health Foundation, Darwin Initiative, Department of Food and Rural Affairs/ Flora & Fauna International, Foreign and Commonwealth Office, Global Greengrants Fund, MCS Turtle Conservation Fund, National Wildlife Federation, National Fish and Wildlife Service, PADI, People's Trust For Endangered Species, and others.
1.5. Photographs	Over 200 photographs, mostly from the MCS marine turtle photo library along with contributions from the CIDoE, arranged into categories including: Conservation, Research and awareness, Harvest, TCOT workshop, Threats, Tiger shark photographs, Turtle pictures.
1.6. Press coverage	Press releases, newspaper and internet articles about the TCOT Workshop.
1.7. TCOT bibliography, MTRG publications and other scientific papers.	The TCOT Bibliography, a Seaturtle.org ID key, as well as 35 .pdf format papers from the Marine Turtle Research Group, arranged into categories including: Diving behaviour, hatchling development, nesting, pollution, research methods, satellite telemetry, status estimates.
1.8. TCOT monitoring protocols and sample datasheets	The TCOT research protocols as well as 6 different sample datasheets from TCOT, the CIDoE and the Bermuda Turtle Project.
1.9. Caribbean Turtlewatch	Dive survey publicity poster, instructions for dive operators, datasheets in pdf format and Access database for entry of dive data.

CD2 - NOAA 'Electronic Reading Room' downloads

2.1. Recovery plans	NOAA US Atlantic Recovery Plans and US Pacific Recovery Plans for six species of marine turtle.
2.2. Symposia	14 separate and full .pdf format copies of Proceedings from all sea turtle symposia from the 8 th Annual Workshop on Sea Turtle Conservation and Biology (1988) to the 20 th Annual Symposium on Sea Turtle Biology and Conservation (2000) inclusive.
2.3. Turtle documents	5 additional marine turtle papers and proceedings from the NOAA Electronic Reading Room, dealing with issues such as the Cuban hawksbill harvest, long-lining, TED's and status assessments.

Table 11.2. Contents of the TCOT REGIONAL TRAINING WORKSHOP CD.



Photo 11.5. Participants of the *International Field Course - Biology and Conservation of Sea Turtles*, Bermuda 2003 (Photos P. Richardson).

TCOT Project Partner	Delegates
Anguilla - Department of Fisheries & Marine Resources,	Carlos Sasso
Bermuda - Bermuda Turtle Project	Jennifer Gray (Course host)
British Virgin Islands - Department of Conservation and Fisheries	Arlington Pickering, Shannon Gore
Cayman Islands – Cayman Islands Department of Environment	Joni Solomon
Turks and Caicos Islands – Department of Environment and Coastal Resources	Jasmine Parker

Table 11.3. TCOT attendees of the 'In-water marine turtle biology and conservation course', 2003.

Annual Sea Turtle Symposium, where she presented a paper about the International Field Course.

The course took place from the 4th to the 15th of August 2003 and reinforced the theoretical side of marine turtle research and conservation, as well as including practical training such as genetic sampling (tissue and blood sampling), tagging (flipper tags, PIT's and satellite telemetry), necropsy protocols and in-water net capture. A MCS press release about the course generated media coverage in Bermuda, BVI, Cayman Islands, Montserrat and the Turks and Caicos Islands.

11.5. Additional TCOT technical and practical assistance

In addition to the above capacity building events, the TCOT team provided continuous technical and practical assistance to the TCOT project partner institutions. These are outlined below:

11.5.1. Tagging and genetics sampling equipment

All necessary equipment required by TCOT project partner institutions to carry out marine turtle biometric measuring, tagging (flipper and PIT), genetics sampling and storage



Photo 11.6. WIDECAST tags on a hawksbill in Anguilla (Photo P. Richardson).

was provided on demand by the TCOT project. The limited equipment and consumables budget was complimented by WIDECAST's donation of tagging equipment, as part of the WIDECAST Wider Caribbean Tag Inventory programme, to all Territories that required tags. In addition, a Marine Conservation Society grant contributed the deployment of a satellite tag on a nesting female leatherback turtle in BVI, and local fundraising efforts in the Cayman Islands contributed to the deployment of satellite tags on 5 individual nesting females there (green and loggerhead turtles) with further planned.

11.5.2. Technical advice notes

The TCOT team produced technical advice notes regarding standard monitoring protocols for nesting and foraging site surveys (see appendix 11.2 and 11.3 respectively). These were distributed to all TCOT project partners and have been widely downloaded from the website.

11.5.3. TCOT datasheets

The TCOT team designed, produced and disseminated the following data collection sheets: TCOT Genetics Sampling Sheet (see appendix 10.1); TCOT Socioeconomic Questionnaire (see appendix 2.1); Caribbean Turtlewatch data collection package (see appendix 2.2, 2.3 & 2.4). TCOT also produced a tourism awareness leaflet entitled *Marine Turtles and Tourism: How you can help*, which included information about the marine turtles of the Caribbean and the threats they face. The leaflet was locally distributed by the project partners to appropriate tourist centres in the Overseas Territories (e.g. airports, hotels, certain attractions etc, see appendix 11.4). The leaflet included a feedback form on which tourists could record the details of any relevant encounters they had with marine turtles in the Territories, including sightings at sea as well as any experiences of marine turtle consumption. A blank space was left on the leaflets on which the TCOT project partners could include their address in order to receive any tourism feedback and any information collected through these leaflets was the sole responsibility of the project partners.

11.5.4. Continuous practical in-situ support

To reinforce the training given to project partners during the TCOT Workshop and the Bermuda Turtle Project course,

Territory	Year	Months	Staff (no. of staff weeks)
Anguilla	2002	March	PR & SR (2 weeks)
		September	PR & SR (2 weeks)
	2003	April-May	PR, SR & LC (5 weeks)
	2004	April-May	PR & SR (6 weeks)
			Total staff weeks: 15
Bermuda	2002	August	BG (1 week)
	2003	August	PR (1 week)
			Total: 2
British Virgin Islands	2002	July	BG (2 weeks)
	2003	April-May	BG, PR & LC (4 weeks)
	2003	November-December	BG, AMcG (6 weeks)
			Total: 12
Cayman Islands	2002	August-September	BG, LC, PR & SR (8 weeks)
	2003	October	BG (1 week)
			Total: 9
Montserrat	2002	February	BG (1 week)
	2002	June	BG (1 week)
	2003	August-September	CM (4 weeks)
			Total: 6 weeks
Turks and Caicos Islands	2002	March	PR & SR (1 week)
	2002	September	LC, PR & SR (3 weeks)
	2003	May-June	JS & LC (7 weeks)
	2004	September	LS & PR (3 weeks)
			Total: 14
			Overall staff week total: 58

Table 11.4. Outline of TCOT staff field trips in each Territory. AMcG= Andy McGowan, BG= Brendan Godley, CM= Corinne Martin, JS= Jennifer Silver, LC= Lisa Campbell, LS= Lorna Slade, PR= Peter Richardson, SR=Sue Ranger.



Photo 11.7. TCOT staff during field visits (Photos P. Richardson, S. Ranger and B. Godley).

TCOT staff/Project partner	Source and Amount	Project
Department of Fisheries and Marine Resources, Anguilla	British Chelonia Group (UK£500)	Construction of turtle sampling nets.
Cayman Islands Department of Environment	National Fish and Wildlife Foundation (UK£18,000)	Support of in-water sampling programme
Cayman Islands Department of Environment TCI DECR associate (Lorna Slade) BVI Conservation and Fisheries Department	International Sea Turtle Society (>UK£2,000)	Attendance at the International Sea Turtle Symposia
Marine Conservation Society	Foreign and Commonwealth Office Environment Fund (UK£16,000)	Attendance of the Bermuda Turtle Project in-water course for 5 project partner officers and Peter Richardson, as well as Jennifer Gray's attendance of the 24 th Annual Sea Turtle Symposium.
Marine Turtle Research Group	Marine Conservation Society (UK£4,000)	Deployment of a satellite tag on a nesting leatherback in BVI
Marine Turtle Research Group	Darwin Initiative (UK£162,000)	Biodiversity Action Plan for Anegada
Marine Turtle Research Group	Natural Environment Research Council (UK£47,000)	Satellite telemetry and diving behaviour of hawksbill turtles in collaboration with the BVI Conservation and Fisheries Department.
Marine Turtle Research Group	Foreign and Commonwealth Office, Department for International Development: Overseas Territories Environment Programme (OTEP) (UK£100,000)	Promotion of marine turtle conservation and management in the context of the Environment Charters and MEA's, to be carried out in collaboration with TCOT project partners in Anguilla, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands.
Marine Turtle Research Group	Department of Environment, Food and Rural Affairs (UK£15,000)	Continued TCOT genetic sampling.

Table 11.5. Successful grant applications during TCOT.

TCOT staff spent considerable time in the field assisting with monitoring and sampling regimes. In Anguilla, Montserrat, Turks and Caicos Islands, and to some extent the British Virgin Islands, project partner institutions experienced logistical difficulties in implementing meaningful and regular monitoring regimes due to lack of human and physical resources, and in some cases due to the inaccessibility of remaining critical marine turtle habitat. In these cases it was necessary for TCOT staff to supplement the activities of the TCOT project partners by spending significant amounts of time in the field to ensure that adequate samples and socio-economic questionnaire data were collected. In several cases the field time incurred by TCOT staff amounted to significantly more than budgeted in the original project bids to Defra and the FCO, however this extra field time led to successful completion of significant TCOT sampling

in all Territories and assistance of project partners with data analysis, reporting and grant proposal writing. TCOT staff contact with project partners between field trips was extensive, involving e-mail, postal, fax and telephone correspondence. Table 11.4 presents a digest of TCOT staff time in each Territory.

11.5.5. Regional e-mail listserv

Although project partners did not use the TCOT listserv as widely as anticipated, it has been extremely useful in disseminating information from the TCOT staff to the partners in a prompt and efficient manner. It should be noted, however, that the infrastructure in several project partner institutions did not allow many employees daily access to e-mail or regular and reliable internet access.

11.5.6. TCOT Bibliography

Since the onset of TCOT, the coordinating staff have compiled and updated a bibliography of literature pertinent to the conservation and biology of marine turtles and their habitats in the UK Overseas Territories in the Caribbean. The bibliography is now in its fourth generation and is included in Appendix 11.5.

11.5.7. Additional Grants

TCOT staff worked with all willing OT partners to help raise funds and win grant awards for additional projects, either within the TCOT scope or pertinent to the overall TCOT mission. An outline of the successful applications made during TCOT is included in table 11.5.

In addition to these efforts, TCOT has supported unsuccessful grant applications by CIDoE to; BP Conservation Awards, Professional Association of Dive Instructors (PADI), and the People's Trust for Endangered Species.

11.5.8. Dissemination of TCOT outputs

The Marine Turtle Research Group, University of Exeter in Cornwall has supported, reviewed and facilitated the following publications by TCOT project partners:

Bell CDL, Parsons J (2002) Cayman Turtle Farm Head-starting Project Yields Tangible Success. Marine Turtle Newsletter 98:5-6

Hastings M (2003) A Conservation Success: Leatherback Turtles in the British Virgin Islands. Marine Turtle Newsletter 99:5-7

In addition, the following paper has been submitted:

Bell CDL, Parsons J, Austin TJ, Broderick AC, Ebanks-Petrie G, Godley BJ (submitted) Some of them came home: Cayman Turtle Farm head-starting project. Oryx

Additional scientific papers will be published which will focus on the TCOT data including subject areas as diverse as marine turtle genetics, exploitation, nesting status and in-water monitoring. For example, papers outlining the status and conservation of marine turtles in Cayman and Montserrat are in their final stages of preparation at the time of writing. All TCOT publications will be co-authored by the appropriate members of the TCOT project in the UKOTs, UK and USA.

Recommendation

We make a major overarching recommendation to the UK Government to support the conservation and management of marine biodiversity in the UK OTs under the Environment Charters.

The Overseas Territories of the UK have long been acknowledged as being rich in biodiversity (Proctor & Fleming 1999). The small islands or island archipelagos of the Caribbean UK Overseas Territories currently do not or are unable to carry out sufficient monitoring, research, management and educational outreach required to ensure the sustainability of their marine and coastal natural resources. TCOT strongly recommends that the UK Government further contributes to marine biodiversity conservation and management in the UK Overseas Territories through provision of funding and expertise under the FCO/DfID Overseas Territories Environment Programme (OTEP), Defra's Darwin Initiative and through the provision of bespoke scholarships for tertiary education in biodiversity/conservation related subjects for citizens of the OTs. Additionally, much of the environmental legislation in the OTs is in need of revision to facilitate the conservation of marine turtles and their habitats, and therefore TCOT strongly recommends that HMG provide the necessary support to the OTs to facilitate the required legislative amendments.

11.6. Acknowledgements

Many thanks to all TCOT partners for their gusto and enthusiasm for fieldwork. In particular CIDoE, CTF and WIDECAST whose collaboration ensured the tremendous success of the TCOT workshop. In addition to conservation organisations, we must also thank members of the fishing communities of Anguilla, BVI and TCI who contributed so significantly to inwater capture sessions. We thank Denise Dudgeon (FCO) for comments on this chapter.

11.7. References

Oldfield S, Sheppard C (1997) Conservation of biodiversity and research needs in the UK Dependent Territories. Journal of Applied Ecology 34: 1111-1121

Proctor, D., Fleming, L.V. 1999. Biodiversity in the Overseas Territories. Peterborough, JNCC.





TCOT Publicity: Getting the Message Across





This document is part of a larger publication and should be cited as:

Godley BJ, Broderick AC, Campbell LM, Ranger S, Richardson PB (2004) 12. TCOT Publicity. Getting the Message Across. In: An Assessment of the Status and Exploitation of Marine Turtles in the UK Overseas Territories in the Wider Caribbean. pp 248-253. Final Project Report for the Department of Environment, Food and Rural Affairs and the Foreign and Commonwealth Office.

The full report is hosted in PDF format at the Project website: <http://www.seaturtle.org/mtrg/projects/tcot/finalreport/>



This project was implemented by the Marine Turtle Research Group (University of Exeter in Cornwall, UK), the Marine Conservation Society (UK), and Duke University (USA) in association with the Cayman Islands Department of Environment, Cayman Turtle Farm, and University of Cardiff (UK). This initial consortium was expanded to include a large number of organisations across the Overseas Territories.

12. TCOT Publicity: Getting the Message Across

Contents

	Page
12.1. TCOT Website < http://www.seaturtle.org/mtrg/projects/tcot/ >	249
12.2. TCOT Leaflet <i>Marine Turtles and Tourism</i>	249
12.3. Printed Reports	249
12.4. Press Releases	250
12.5. Summary of TCOT Media Coverage until July 2004	250-251
12.5.1. International	250
12.5.2. Overseas Territories	250
12.5.3. UK	251
12.6. Scientific Papers	251
12.7. TCOT Presentations	251-253
12.7.1. International Scientific Meetings	251
12.7.2. Public Meetings in the OT's	252
12.7.3 Oral Presentations at Meetings in the UK and the USA	253
12.8. Educational Pack	253

The TCOT staff have maximised publicity of the project, having issued press releases at key moments in the project's progress, engaged broadcast and print media during field trips and expended significant effort in addressing conferences and other international fora. In addition, the TCOT website has publicised the project on the Internet and a number of informational documents have addressed an array of audiences.

12.1. TCOT Website

<<http://www.seaturtle.org/mtrg/projects/tcot/>>

The website was created in the early stages of TCOT and presents an outline of the project, as well as including some of the TCOT outputs.

The site was designed and is hosted courtesy of SEATURTLE.ORG and displays the logos of Defra, FCO and the institutions represented by the coordinating team. Project partners are listed and links to partner websites are maintained where appropriate. It has been visited extensively, with over 17,250 visitors by July 2004. TCOT outputs posted on the site to date include:

- TCOT Bibliography (>2,200 downloads)
- TCOT Genetics Sampling Sheet (>1,200 downloads)
- TCOT Tourism Leaflet (>800 downloads)
- TCOT Press Releases (>1000 downloads)
- TCOT Workshop Report (>300 downloads)
- TCOT Advice Notes (>500 downloads)

To facilitate partner input, the final report was hosted on the website in draft format and to maximise dissemination it will be published there in its entirety.

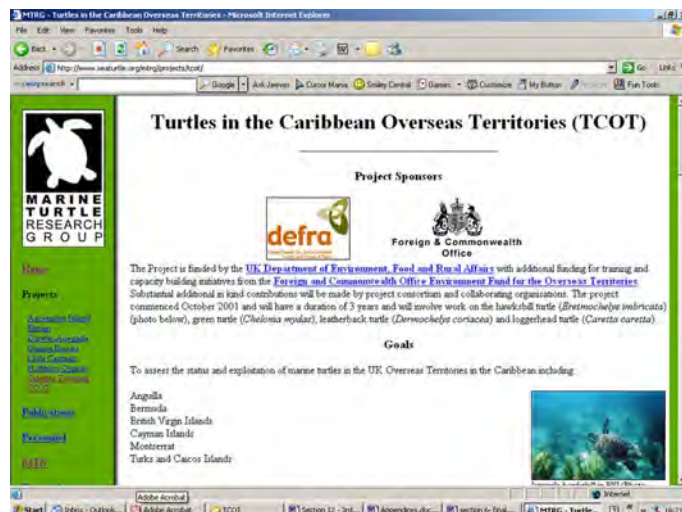


Photo 12.1. TCOT website.

12.2. TCOT Leaflet 'Marine Turtles and Tourism'

As described in section 11, one of the first TCOT outputs was production of 10,000 information leaflets designed to inform tourists visiting the Overseas Territories about the turtles they may encounter there (appendix 11.4). These were funded by MCS with support of Cheltenham and Gloucester plc.

12.3. Printed Reports

TCOT staff have produced sequential reports throughout the duration of the project. These are outlined in table 12.1 below.

Date	Document	Audience
May 2002	Briefing report	CITES Hawksbill Range States Dialogue Meeting
October 2002	TCOT briefing leaflet (Appendix 12.1)	Distributed by UK delegation, CITES CoP12
April 2003	Notes from the TCOT Regional Training Workshop: Marine Turtle Research And Monitoring (Appendix 11.1)	Project partners and public
February 2004	Interim TCOT report: Marine Turtle Utilisation in the Caribbean OT's (content superseded by this report).	Defra & Steering Group
August 2004	Final TCOT report (1 st Draft)	Defra, Steering Group, Peer Review Panel & Project Partners.
October 2004	Final TCOT report	Public

Table 12.1. Reports produced during TCOT.

12.4. Press Releases

The following TCOT press releases were issued at key events in the project's progress:

TCOT launch - 'UK to Investigate Marine Turtle Exploitation in the Overseas Territories', released 14.11.01. (**Appendix 12.2**).

TCOT Workshop - 'Research into Endangered Caribbean Turtles Gets Boost from UK Support', released 22.11.02. (**Appendix 12.3**).

FCO supports TCOT attendance of Bermuda course - 'Conservation Officers From The UK's Caribbean Overseas Territories Learn How To Save Endangered Turtles', released 15.08.03. (**Appendix 12.4**).

A final press release will be issued with the launch of the final TCOT report and by then TCOT press releases will have generated in excess of 50 responses in international, national and local print and broadcast media. The summary below lists all recorded media coverage regarding TCOT up to July 2004.

12.5. Summary of TCOT Media Coverage until July 2004

12.5.1. International Coverage

Nov 2001	Article on <i>Navalweb.com</i>
Nov 2001	Article in <i>IWMC World Conservation Trust Newsletter</i>
Feb 2002	Article in <i>UKOTCF Forum News 21</i>
Aug 2002	Interviews re. the TCOT workshop on <i>BBC Radio Caribbean</i>
Oct 2002	Announcement in the <i>Marine Turtle Newsletter</i>
Feb 2004	Article in <i>UKOTCF Forum News 24</i>

12.5.2. Coverage in the Overseas Territories

Anguilla

March 2002	Interview on <i>Radio Anguilla</i>
	Interview on <i>Heart Radio</i>
March 2003	Interview on <i>Radio Anguilla</i>
Aug 2003	Interview on <i>Radio Anguilla</i>
May 2004	Article in <i>The Anguillan</i>

Bermuda

Winter 2002	Article in <i>Critter Talk</i> Vol 25 Number 4
Aug 2003	Article in the <i>Royal Gazette</i>
Aug 2003	Article in the <i>Bermuda Sun</i>
April 2004	Article in <i>Critter Talk</i> Vol 27 Number 2

BVI

May 2003	Article in <i>The BVI Beacon</i>
	Article in the <i>Standpoint</i>
Aug 2003	Article in <i>The BVI Beacon</i>

Cayman

Aug 2002	Article on <i>Caymannetnews.com</i>
	2 articles in the <i>Caymanian Compass</i>
	2 radio interviews
	1 TV interview
Aug 2003	Article on <i>Caypolitics.com</i>
Aug 2003	Article in <i>Caymanian Compass</i>
Jan 2004	Article in in-flight magazine <i>Destination Cayman 2004</i>

Montserrat

Nov 2001	Article in the <i>Montserrat Reporter</i> ,
Jun 2002	3 radio features
	2 newspaper articles
Aug 2003	1 newspaper interview in the <i>Montserrat Reporter</i> .
Sept 2003	3 interviews on <i>Montserrat Radio JZB</i>
	1 interview on <i>Family Radio</i>

TCI

Nov 2001	Article in <i>The Turks and Caicos Free Press</i>
July 2002	Picture story feature in <i>Times of the Islands</i>
Apr 2002	1 local radio interview
Aug 2003	1 article in the <i>Turks & Caicos Free Press</i>
Sept 2003	1 local radio interview
	1 article in the <i>Turks & Caicos Free Press</i>



Photo 12.2. TCOT launch press coverage.



Photo 12.3. TCOT training workshop press coverage.

12.5.3. Coverage in the UK

Nov 2001	Article in the <i>South Wales Evening Post</i>
Nov 2001	Article in the <i>Western Mail</i>
Dec 2001	Article in <i>Country Living</i>
Jan 2002	Article in <i>Biodiversity News</i>
Mar 2002	Article in <i>Diving Trade</i>
April 2002	Article in <i>Talk Turtle</i> and on the <i>Adopt-a-Turtle renewal poster</i>
Aug 2002	Article in the <i>Wrexham Evening Leader</i>
Oct 2002	Photo-feature article in <i>MCS magazine Marine Conservation</i>
Dec 2002	Article on <i>icWales.co.uk</i>
July 2003	Article in <i>Testudo</i>
Sept 2003	Interview for <i>Nature</i> programme, BBC Radio 4.

12.6. Scientific Papers

The MTRG has supported, reviewed and facilitated the publication of various scientific papers authored by TCOT project partners (see section 11).

12.7. TCOT Presentations

The TCOT staff have made every effort to present the TCOT project to a wide audience at various formal and informal fora in the UK, the Overseas Territories and at international meetings.

12.7.1. International Scientific Meetings

Apr 2002	Poster at International Sea Turtle Symposium, Miami (PR)
Mar 2003	Oral at the UKOTCF Conference, Bermuda (BG)
Mar 2003	Poster at the UKOTCF Conference Bermuda (BG)
Mar 2003	Oral International Sea Turtle Symposium, Kuala Lumpur (SR)
Mar 2003	Poster at International Sea Turtle Symposium, Kuala Lumpur (PR)
Feb 2004	Poster at International Sea Turtle Symposium, Costa Rica (JB)
Feb 2004	Poster at International Sea Turtle Symposium, Costa Rica (CB)
Feb 2004	Poster at International Sea Turtle Symposium, Costa Rica (LS)
Feb 2004	Oral at International Sea Turtle Symposium, Costa Rica (JS)
Feb 2004	Oral at International Sea Turtle Symposium, Costa Rica (JG)
May 2004	Oral at Annual Meeting of Canadian Association of Geographers (JS)



Photo 12.4. Bermuda training course press coverage.

12.7.2. Public Meetings in the OT's

Bermuda

- Aug 2002 Presentation at Bermuda Turtle Project In-water course (BG)
- Aug 2003 Presentation at Bermuda Turtle Project In-water course (PR)

BVI

- Jul 2002 Presentation at BVI CFD Summer School

Cayman

- Aug 2002 Presentation at the Public Meeting in Cayman Hilton (BG)
- Aug 2002 Presentation at the Public Meeting in Cayman Hilton (PR)
- Aug 2002 Presentation at the Public Meeting in Cayman Hilton (J Solomon)

Montserrat

- June 2002 6 presentations in RSPB/MNT Biodiversity road show (BG)

TCI

- Sept 2003 Public presentation at the National Environmental Centre, Provo (PR)
- Sept 2003 Presentation to Chief Minister and staff (PR)



Photo 12.5. Sue Ranger and Peter Richardson present TCOT at the 23rd International Sea Turtle Symposium, Kuala Lumpur (Photos P. Richardson).





Photo 12.6. Brendan Godley presents TCOT at UKOTCF conference, Bermuda, March 2003.

12.7.3. Oral Presentations at Meetings in the UK and the USA

Oct 2002	British Chelonia Group Northern Symposium, Chester (PR)
Oct 2002	Marine Conservation Society Annual Conference, Edinburgh (PR)

Oct 2002	AGM of the UKOT Conservation Forum, Cambridge (BG)
Nov 2002	Guest lecture, Wildlife Conservation MSc, University of Reading (PR/SR)
Mar 2003	London Dive Show, Excel Centre (PR)
Nov 2003	Guest lecture, Wildlife Conservation MSc, University of Reading (PR)
Mar 2004	Oral at Duke University Marine Lab Advisory Board Meeting (LC)
Apr 2004	Oral at Duke University Board of Visitors Meeting (LC)

12.8. Educational Pack

Educational materials have been produced by the Marine Conservation Society to encourage teachers and educators in the UK to use marine turtles as their subject matter across a range of disciplines. These materials have been distributed to all OT's. Building upon this, as part of an OTEP funded project, the team, in conjunction with local partners, will design educational materials (for school children and adults) to increase awareness and report back some of the findings of recent turtle research in the OTs. We will work with each OT to design OT specific educational resources including local data, images and input from local people.



TURTLES IN THE CARRIBBEAN OVERSEAS TERRITORIES (TCOT) SURVEY QUESTIONNAIRE

Introduction

Introduce yourself as part of a sea turtle study in your OT which is part of a wider Caribbean project.

Purpose

To study and describe the value of sea turtles to a variety of people

This survey will include interviews with fishermen, people who use turtle products and others who are interested in sea turtles.

The information will be used to inform and advise OT and UK governments on sea turtle management.

Questions

The interview includes questions about:

How you earn your living

Your knowledge and experience of sea turtles

Your opinions on conservation

If you have any questions, please ask as we go along.

Timing

The interview will take will take at least 1 hour (revise as appropriate)

Confidentiality

Answers are confidential and will not be used against you now or in the future.

You can stop the interview at any time and skip questions you don't want to answer.

You do not have to participate

Additional information

Funding: 3 year project funded by UK Department of Environment, Food and Rural Affairs and the Foreign and Commonwealth Office Environment Fund for the Overseas Territories (EFOT)

Partners: Marine Turtle Research Group, Marine Conservation Society, University of Western Ontario

**ASK THE INTERVIEWEE IF THEY AGREE TO PARTICIPATE IN THIS SURVEY.
IF NO, PLEASE COMPLETE A LINE ON THE RECORDING SHEET ONLY.
IF YES, COMPLETE A LINE ON THE RECORDING SHEET AND REMEMBER
TO RECORD THE INFORMATION BELOW BEFORE CONTINUING WITH THE
QUESTIONNAIRE.**

Interview number

Interviewer

Date

Location

Start time

End time

SECTION 1: DEMOGRAPHIC INFORMATION

1

Gender

MALE

FEMALE

2

Age

15-25

26-35

36-45

46-55

56-65

65+

3

Education

Was your highest level of formal education at primary school, secondary school or university/college?

Have you had any other technical training?

YES

NO

If yes, please describe.

4

Where were you born?

town/city/village and country

5

Where do you live now?

town/city/village and country

6

How long have you lived here?

Years

Months

7

Where did you live before moving here?

town/city/village and country

8

What is your status here?

Native

Naturalised

Resident

Visitor

specify

Other

9

Do you have children who depend upon you financially?

YES

NO

Number

Do you have adults who depend upon you financially?

YES

NO

Number

NOTES

SECTION 2: LIVELIHOODS

10

Are you currently employed, unemployed or retired?

EMPLOYED

Go to 12

UNEMPLOYED

or

RETIRED

Go to 11

11

If you are unemployed or retired, what were your former jobs?

12

Do you fish as a means of supporting yourself either for cash or for food (rather than as a hobby?)

YES

NO

(tick all that apply)

If yes

CASH

FOOD

If no AND retired or unemployed go to SECTION 3

13

What jobs and other unpaid activities do you currently do to support yourself?

Can you rank the jobs/activities in order of importance, with 1 being most important?

Rank

What year did you start?

Y

Y

What year did you start?

Y

Y

What year did you start?

Y

Y

What year did you start?

Y

Y

What year did you start?

Y

Y

14

Are any of the jobs and activities you have told me about limited to certain months of the year?

YES

If yes, draw a line through all months when you do these jobs or activities

NO

Go to Q 15

JOB or ACTIVITY (identified in 13 above)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

15

Are there any activities or jobs that you used to do that you no longer do?

YES

NO

If no, go to Q 16

If yes, what jobs/activities did you do?

Why do you no longer do them?

16

Is there anyone living in your household who contributes financially to your household in a major way?

YES

NO

NO ANSWER

If no/no answer, go to Q 17

If yes, what is their main job?

17

Do you receive money from friends or family living abroad?

YES

NO

NO ANSWER

The following question is about your knowledge of sea turtles

18

Many of the questions in this survey relate to sea turtles. Where possible we would like you to differentiate between species, but if you feel unable to do so, you can refer to turtles in general.

Do you feel confident that you are able to differentiate between species?

NO

Go to Section 3

YES

Show the interviewee the species chart and ask for local names of the turtles shown. Note below whether the interviewee was able to identify the species correctly.

PLEASE NOTE: If the interviewee has been unable to distinguish between species at this point, make it clear that all future questions about turtles will be about turtles in general. If they are able to distinguish between species, then they should try to refer to specific species in the following sections.

NOTES

SECTION 3: FISHERMEN

19

Do you or have you ever fished to earn cash, for subsistence or for pleasure?

CASH

SUBSISTENCE

PLEASURE

DON'T FISH

Go to Q20

Go to SECTION 4

20

Which of the following do you or have you ever fished for? For cash or for food?

CONCH

CASH

FOOD

DON'T FISH

LOBSTER

CASH

FOOD

DON'T FISH

FISH
(General)

CASH

FOOD

DON'T FISH

SEA TURTLES

CASH

FOOD

DON'T FISH

Other animal

CASH

FOOD

Other animal

CASH

FOOD

21

Do you currently fish for all these animals?

NO

YES

If YES go to Q22

11

If no, which do you no longer fish for?

What year did you stop?

Y

Y

21a

Why did you stop?

21b

Of the animals you no longer fish for, how important were they to your fishing before you stopped?

VERY IMPORTANT

SOMEWHAT IMPORTANT

NOT IMPORTANT

VERY IMPORTANT

SOMEWHAT IMPORTANT

NOT IMPORTANT

VERY IMPORTANT

SOMEWHAT IMPORTANT

NOT IMPORTANT

22

Of the animals you currently fish for, can you rank their importance to your fishing from most to least important, has their importance changed, and when did you start fishing for each animal?

ANIMAL

How important is this fishing to you compared to 5 years ago?

Start year

MOST IMPORTANT

MORE IMPORTANT

LESS IMPORTANT

NOT IMPORTANT

Y

Y

2ND MOST IMPORTANT

MORE IMPORTANT

LESS IMPORTANT

NOT IMPORTANT

Y

Y

3RD MOST IMPORTANT

MORE IMPORTANT

LESS IMPORTANT

NOT IMPORTANT

Y

Y

4TH MOST IMPORTANT

MORE IMPORTANT

LESS IMPORTANT

NOT IMPORTANT

Y

Y

5TH MOST IMPORTANT

MORE IMPORTANT

LESS IMPORTANT

NOT IMPORTANT

Y

Y

23

In what months do you fish for each animal and how often (e.g. daily, weekly, monthly) do you go fishing during the season?

ANIMAL (identified in 22 above)

JAN

FEB

MAR

APR

MAY

JUN

JUL

AUG

SEP

OCT

NOV

DEC

HOW OFTEN?

The following questions are about changes to the fishery over time

24a

We are interested in whether or not you've noticed changes in the number (abundance) of the animals you fish for. First of all, can you tell me if you've noticed a change to numbers overall?

YES

NO

If NO, go to Q 26

If the interviewee answers YES, you should go on to ask about changes in abundance of each of the species in Q24b&c

24b

For each of the animals you fish for, have numbers increased, decreased or stayed the same compared to 5 years ago?

24c

For each of the animals you fish for, have numbers increased, decreased or stayed the same since you started fishing?

ANIMAL

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

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INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

25

Why do you think the changes you mentioned have taken place?

ANIMAL

Important factors influencing abundance? (list as many as provided)

The following questions are about ACCIDENTAL capture of sea turtles when fishing for other animals

26

Do you (or did you) ever catch sea turtles, accidentally when you're fishing for other things?

YES

Go to Q27

NO

Go to Section 4

27

Approximately how many turtles are (were) accidentally caught by you each year?

27a

What state are turtles in when you accidentally catch (caught) them?

MOSTLY DEAD

EQUAL ALIVE/DEAD

MOSTLY ALIVE

27b

What fishing methods are (were) you using when you catch (caught) turtles?

IF THE INTERVIEWEE INDICATED IN SECTION 2 THAT THEY COULD NOT CONFIDENTLY DISTINGUISH BETWEEN THE TURTLE SPECIES, ANSWERS TO THE FOLLOWING SHOULD BE GIVEN FOR TURTLES IN GENERAL. IF THEY ARE ABLE TO DISTINGUISH ASK ABOUT EACH SPECIES INDIVIDUALLY.

27c

When turtle capture is (or was) accidental, which species of turtle do (did) you catch most often?

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

27d

What other species do (did) you catch accidentally? (Check all species identified)

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

28

When turtle capture is (was) accidental, what do (did) you do with the turtle and why do (did) you do this?

Species	Release	Discard	Keep (check all that apply)	Other	Why do you do this?
GREEN			SELL USE GIFT		
LEATHERBACK			SELL USE GIFT		
LOGGERHEAD			SELL USE GIFT		
HAWKSBILL			SELL USE GIFT		
GENERAL			SELL USE GIFT		

29

Do (or did) other fishermen ever catch sea turtles, accidentally when they're fishing for other things?

YES

NO

DON'T KNOW

If NO or DON'T KNOW go to SECTION 4

30

If yes, what do you think that most fishermen do with accidentally caught turtles?

Species	Release	Discard	Keep (check all that apply)	Other	Why do they do this?
GREEN			SELL USE GIFT		
LEATHERBACK			SELL USE GIFT		
LOGGERHEAD			SELL USE GIFT		
HAWKSBILL			SELL USE GIFT		
GENERAL			SELL USE GIFT		

NOTES

SECTION 4: TURTLE FISHERMEN

IMPORTANT NOTE: THIS SECTION IS SPECIFICALLY FOR TURTLE FISHERMEN. IF THE INTERVIEWEE DID NOT IDENTIFY SEA TURTLES IN SECTION 3, CONFIRM THAT THEY DO NOT AND HAVE NEVER FISHED FOR TURTLES AND GO ON TO SECTION 5.

IF THE INTERVIEWEE INDICATED IN SECTION 2 THAT THEY COULD NOT CONFIDENTLY DISTINGUISH BETWEEN THE TURTLE SPECIES, ANSWERS TO THE FOLLOWING SHOULD BE GIVEN FOR TURTLES IN GENERAL. IF THEY ARE ABLE TO DISTINGUISH ASK ABOUT EACH SPECIES INDIVIDUALLY.

31a

When you fish for turtles, do (did) you fish for them intentionally (directly), or when you come (came) accross them (opportunistically) or both?

INTENTIONAL

OPPORTUNISTIC

BOTH

31b

Which species do (did) you fish for directly (intentionally)? *Check all that apply.*

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

NONE

31c

Which species do (did) you fish for only when you come accross them (opportunistically)? *Check all that apply.*

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

NONE

32

How many turtles of each species do (did) you catch per year, and what size are they?

Species	Average catch/season	Average size (lbs)	Maximum size (lbs)	Minimum size (lbs)
GREEN				
LEATHERBACK				
LOGGERHEAD				
HAWKSBILL				
GENERAL				

33

Which species of turtle do (did) you prefer to catch

NO PREFERENCE

	Species	Why do you prefer this species?
1ST CHOICE		
2ND CHOICE		
3RD CHOICE		

The following questions are about fishing methods and seasonality

34

Do you fish for different species of turtle at different times of year?

YES

If yes, draw a line through all months when you fish for each species and indicate peak months by writing a P in the relevant box.

NO

If no, go to Q35

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GREEN												
LEATHERBACK												
LOGGERHEAD												
HAWKSBILL												
GENERAL <i>(See response to Q23)</i>												

35 How often (e.g. daily, weekly, monthly) do (did) you go fishing during the season for each species?

GREEN	DAILY	WEEKLY	MONTHLY	YEARLY
LEATHERBACK	DAILY	WEEKLY	MONTHLY	YEARLY
LOGGERHEAD	DAILY	WEEKLY	MONTHLY	YEARLY
HAWKSBILL	DAILY	WEEKLY	MONTHLY	YEARLY
GENERAL (See response to Q23)	DAILY	WEEKLY	MONTHLY	YEARLY

36 What influences (influenced) when you fish for turtles? (e.g. Season, laws, demand for specific events etc.)

37 What methods do (did) you use to catch turtles? Have the methods that you use changed?

If methods used have changed, indicate methods used in the past with a P in the relevant box.

Species	NET	SPEAR GUN	HAWAIIAN SLING	HAND CAPTURE	NESTING BEACH	OTHER
GENERAL						
LEATHERBACK						
LOGGERHEAD						
HAWKSBILL						
GREEN						

37a If you catch (or caught) turtles with nets, can you describe them for me? (length, depth, mesh size, type of twine, colour, floating or set, types of floats and weights, total number owned, total number in use).

NOTE: If fishing gear is not easily described, make a diagram here or in the space for notes at the end of this section (PAGE 13).

Explain to the interviewee that we are conducting this survey in 6 Caribbean OT's and that the following set of questions aim to find out more about their opinions on some of the legislation/rules already being used in the region.

38 What is your opinion on each of the following statements?

38a There should be regulations for which species of turtle can be caught.

YES, REGULATIONS	NO OPINION	NO REGULATIONS	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38b There should be regulations for the type of fishing gear and methods that can be used to catch turtles

YES, REGULATIONS	NO OPINION	NO REGULATIONS	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38c There should be regulations for the number of turtles that can be caught

YES, REGULATIONS	NO OPINION	NO REGULATIONS	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38d There should be size limits for turtles caught

YES, SIZE LIMITS	NO OPINION	NO SIZE LIMITS	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38e Open and closed fishing zones should be set for turtle fishing

YES, ZONES	NO OPINION	NO ZONES	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38f Open and closed seasons should be set for turtle fishing

YES, SEASONS	NO OPINION	NO SEASONS	NOT APPLICABLE: EXPLANATION
Why do you think so?			

38f Who do you think should be involved in setting the regulations for turtle fishing? *(List all parties identified)*

The following questions are about how turtles and their parts are used.

39 When you catch (caught) turtles, do (did) you sell any whole turtles or turtle parts?

YES

NO

If NO, go to Section 5

What, specifically, do you sell?

WHOLE TURTLE, UNBUTCHERED	MEAT	SHELL, PIECES	SHELL, WHOLE	OTHER TURTLE PARTS

The following questions are about sale of turtle products.
Only ask about the products already identified by the interviewee in Q39.

SALE OF THE WHOLE TURTLE, UNBUTCHERED

40 If you sell a whole turtle WITHOUT BUTCHERING IT YOURSELF, how many do you sell a year and how much do you get for an individual turtle?

Species	Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>		Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>
GREEN			HAWKSBILL		
LEATHERBACK			GENERAL		
LOGGERHEAD					

40a How is the price paid for a whole, unbutchered turtle determined and who sets it? (e.g. supply, season, size, etc?)

DK

40b How often does the price paid for a whole, unbutchered turtle change?

RARELY (once a year)

OFTEN (Several times a year)

CONSTANTLY (price is always changing)

DK

40c Where or to whom do you sell the turtle?

Street	Homes	Market	Fish landing	Restaurant	Retailer e.g shop
YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

Do you sell whole turtles to anyone else or at any other location?

SALE OF TURTLE MEAT

41 If you butcher the turtle and sell the meat, how much do you sell and how much do you get for it?

Species	Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>		Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>
GREEN			HAWKSBILL		
LEATHERBACK			GENERAL		
LOGGERHEAD					

41a How is the price paid for turtle meat determined and who sets it? (e.g. supply, season, type of meat, etc?)

DK

41b How often does the price paid for turtle meat change?

RARELY (once a year)

OFTEN (Several times a year)

CONSTANTLY (price is always changing)

DK

41c Where or to whom do you sell the turtle meat?

Street	Homes	Market	Fish landing	Restaurant	Retailer e.g shop
YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

Do you sell turtle meat to anyone else or at any other location?

SALE OF WHOLE TURTLE SHELLS

42

If you SELL TURTLE SHELL WHOLE, who do you sell it to, how much do you sell and how much do you get for it?

Species	Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>		Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>
GREEN			HAWKSBILL		
LEATHERBACK			GENERAL		
LOGGERHEAD			What is the average size (in feet) of the the shells that you sell?		

42a

How is the price paid for whole turtle shells determined and who sets it? (e.g. quality,, species, size, etc?)

DK

42b

How often does the price paid for whole turtle shells change?

RARELY (once a year)

OFTEN (Several times a year)

CONSTANTLY (price is always changing)

DK

42c

Where or to whom do you sell the whole turtle shells?

Street	Homes	Market	Fish landing	Restaurant	Hotel	Retailer e.g shop
YESNO	YESNO	YESNO	YESNO	YESNO	YESNO	YESNO

Do you sell whole turtle shells to anyone else or at any other location?

SALE OF WORKED TURTLE SHELLS

43

If you sell worked shell (items made from scutes), how much do you sell and how much do you get for it?

Species	Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>		Amount <i>number per year</i>	Price - local \$ <i>per pound or by number</i>
GREEN			HAWKSBILL		
LEATHERBACK			GENERAL		
LOGGERHEAD					

43a

How is the price paid for worked turtle shells determined and who sets it? (e.g. supply, species, quality, etc?)

DK

43b

How often does the price paid for worked turtle shells change?

RARELY (once a year)

OFTEN (Several times a year)

CONSTANTLY (price is always changing)

DK

43c

Where or to whom do you sell the worked turtle shells?

Street	Homes	Market	Fish landing	Restaurant	Hotel	Retailer e.g shop
YESNO	YESNO	YESNO	YESNO	YESNO	YESNO	YESNO

Do you sell worked turtle shells to anyone else or at any other location?

SALE OF OTHER TURTLE PARTS

44 If you sell other turtle parts, can you tell me what parts you sell, in what quantities and how much you get for parts?

Parts	Amount <i>number per year</i>	Price - local \$ <i>per pound/by number</i>

Parts	Amount <i>number per year</i>	Price - local \$ <i>per pound/by number</i>

44a How is the price of parts determined?

DK

44b Where, or to whom, do you sell the parts?

NOTES

SECTION 5: TURTLE EGG COLLECTORS

45

Do you (or did you ever) take turtle eggs from the beach?

CURRENTLY

Go to Q46

FORMERLY

Go to Q45a

NEVER

Go to Section 6

45a

When did you stop collecting turtle eggs?

Year

Y

Y

45b

Why did you stop collecting turtle eggs?

IF THE INTERVIEWEE INDICATED IN SECTION 2 THAT THEY COULD NOT CONFIDENTLY DISTINGUISH BETWEEN THE TURTLE SPECIES, ANSWERS TO THE FOLLOWING SHOULD BE GIVEN FOR TURTLES IN GENERAL. IF THEY ARE ABLE TO DISTINGUISH ASK ABOUT EACH SPECIES INDIVIDUALLY.

46

Which species of turtle eggs do (did) you collect? *(Check all that apply)*

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

47

Which species of turtle eggs do (did) you prefer? *(Check all that apply)*

GREEN

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GENERAL: DON'T DISTINGUISH

NO PREFERENCE

47a

Why is this your preference?

Go to Q48

48

During which months do (did) you collect turtle eggs (in general or by specific species) from the beach? In which months do you collect the most (P) ? *(Draw a line through all the months indicated and indicate peak months with a P)*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GENERAL	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
LEATHERBACK	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
LOGGERHEAD	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
HAWKSBILL	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
GREEN	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

49

How often do (did) you collect turtle eggs during the season?

DAILY

WEEKLY

MONTHLY

YEARLY

50

What factors influence when you collect turtle eggs? (e.g. opportunity, weather, demand etc.)

51

When you collect eggs on the beach, do (did) you ever sell them?

YES

Go to Q52

NO

Go to SECTION 6

SALE OF TURTLE EGGS

52 If you sell turtle eggs, how many do you sell and how much do you get for them?

Species	Amount <i>number per year</i>	Price - local \$ <i>per egg</i>		Amount <i>number per year</i>	Price - local \$ <i>per egg</i>
GREEN			HAWKSBILL		
LEATHERBACK			GENERAL		
LOGGERHEAD					

52a How is the price paid for turtle eggs determined and who sets it? (e.g. supply, season, species, etc?)

DK

52b How often does the price paid for turtle eggs change?

52c Where or to whom do you sell the turtle eggs?

Street	Homes	Market	Fish landing	Restaurant	Retailer e.g shop
YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

Do you sell turtle eggs to anyone else or at any other location?

NOTES

SECTION 6: TURTLE VENDORS (DIRECT)

53

Do (did) you own/manage a business where sea turtle products COULD be sold? (e.g. a restaurant, butcher shop, grocery, or gift shop)

YES

NO

If NO Go to SECTION 7

54

What type of business do (did) you own/ manage?

55

How many staff are (were) employed in this business?

Full time

Part time

56

Does or did your business ever sell sea turtle products?

CURRENTLY

Go to 56a

FORMERLY

Go to 56b

NEVER

Go to 56c

56a

What products are (were) sold?

MEAT

YES

NO

EGGS

YES

NO

WHOLE SHELL

YES

NO

WORKED SHELL

YES

NO

OTHER PRODUCTS

YES

NO

56b

When did you sell turtle products?

Start date

YY

Stop date

YY

Why did you stop?

56c

Why have you chosen not to sell sea turtle products?

If Never, go to SECTION 7

IF THE INTERVIEWEE INDICATED IN SECTION 2 THAT THEY COULD NOT CONFIDENTLY DISTINGUISH BETWEEN THE TURTLE SPECIES, ANSWERS TO THE FOLLOWING SHOULD BE GIVEN FOR TURTLES IN GENERAL. IF THEY ARE ABLE TO DISTINGUISH ASK ABOUT EACH SPECIES INDIVIDUALLY.

The following questions are about products you purchased for resale to customers.

57

Through the following question we want to establish which species of turtle the products you purchase(d) came from and and how often you purchase these products.

	Which species of turtle does (did) this product come from?	How often do (did) you purchase this product? (D=daily W=weekly M=monthly Y=yearly DK = don't know)
MEAT	GENERAL	D W M Y DK NA
EGGS	GENERAL	D W M Y DK NA
WORKED SHELL	GENERAL	D W M Y DK NA
WHOLE SHELL	GENERAL	D W M Y DK NA
OTHER PRODUCT (specify)	GENERAL	D W M Y DK NA
OTHER PRODUCT (specify)	GENERAL	D W M Y DK NA

58

Where do (did) you purchase the turtle products you sell (sold)? (Check all that apply)

FISH LANDING SITE (specify)

HOMES

MARKET

OTHER PLACE (specify)

OTHER PLACE (specify)

OTHER PRODUCTS

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

59

What determines the price you pay (paid) for the products? (e.g availability, seller, species, season etc.)

MEAT

DK

EGGS

DK

WORKED SHELL

DK

WHOLE SHELL

DK

OTHER PRODUCT(specify)

DK

OTHER PRODUCT(specify)

DK

60a

We are interested in whether or not you've noticed changes in the availability of turtle products. First of all, can you tell me if you've noticed a change in availability overall?

YES

NO

If NO, go to Q 62

If the interviewee answers YES, you should go on to ask about changes in availability of each of the products in Q69b&c.

60b

For each of the products below, has availability increased, decreased or stayed the same compared to 5 years ago?

MEAT

INCREASE

DECREASE

SAME

DK

EGGS

INCREASE

DECREASE

SAME

DK

WORKED SHELL

INCREASE

DECREASE

SAME

DK

WHOLE SHELL

INCREASE

DECREASE

SAME

DK

OTHER PRODUCT(specify)

INCREASE

DECREASE

SAME

DK

OTHER PRODUCT(specify)

INCREASE

DECREASE

SAME

DK

60c

For each of the products below, has availability increased, decreased or stayed the same since you can remember

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

61

Why do you think that availability of turtle products has changed?

DK

The following set of questions are about the sale of turtle products to customers.

62

Do your sales of marine turtle products vary throughout the year?

YES

If yes, draw a line through all months when products are sold and indicate peak months by writing a P in the relevant box.

NO

Go to Q 63

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MEAT												
EGGS												
WORKED SHELL												
WHOLE SHELL												
OTHER PRODUCT(specify)												
OTHER PRODUCT(specify)												

63

Are (were) there particular events in the year (festivals, religious holidays, etc.) for which you sell (sold) marine turtle products or increased sales of turtle products?

YES

Please specify

NO

Go to Q 64

64

How do (did) you determine the price that you charge (charged) for turtle products?

MEAT		DK
EGGS		DK
WORKED SHELL		DK
WHOLE SHELL		DK
OTHER PRODUCT(specify)		DK
OTHER PRODUCT(specify)		DK

65

Is (was) the sale of sea turtle products very important, somewhat important or of little importance to your business?

VERY IMPORTANT	SOMEWHAT IMPORTANT	OF LITTLE IMPORTANCE	DON'T KNOW

66a

We are interested in whether or not you've noticed changes in the demand for turtle products. First of all, can you tell me if you've noticed a change in demand overall?

YES

NO

If NO, go to Q 68

If the interviewee answers YES, you should go on to ask about changes in availability of each of the products in Q66 b&c.

66b

For each of the products below, has demand increased, decreased or stayed the same compared to 5 years ago?

MEAT	INCREASE	DECREASE	SAME	DK
EGGS	INCREASE	DECREASE	SAME	DK
WORKED SHELL	INCREASE	DECREASE	SAME	DK
WHOLE SHELL	INCREASE	DECREASE	SAME	DK
OTHER PRODUCT(specify)	INCREASE	DECREASE	SAME	DK
OTHER PRODUCT(specify)	INCREASE	DECREASE	SAME	DK

66c

For each of the products below, has demand increased, decreased or stayed the same since you can remember

INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK

67

Why do you think that demand for turtle products has changed?

	DK

68

Who are the main purchasers of turtle products? (men, women, older, younger, local people, expatriate residents, tourists, nationalities...)

MEAT	
EGGS	
WHOLE SHELL	
WORKED SHELL	
OTHER PRODUCT (specify)	
OTHER PRODUCT (specify)	

69

How do the following groups of people react to the sale of turtle products in your store? Do most people agree, have no opinion, or disagree:

NATIVE	AGREE	NO OPINION	DISAGREE	DON'T KNOW	NA: NOT CUSTOMERS	
NATURALISED	AGREE	NO OPINION	DISAGREE	DON'T KNOW	NA: NOT CUSTOMERS	
RESIDENT	AGREE	NO OPINION	DISAGREE	DON'T KNOW	NA: NOT CUSTOMERS	
VISITOR	AGREE	NO OPINION	DISAGREE	DON'T KNOW	NA: NOT CUSTOMERS	
OTHER PEOPLE (specify)		AGREE	NO OPINION	DISAGREE	DON'T KNOW	NA: NOT CUSTOMERS

Green sea turtles have been farmed in the Cayman Islands. The following set of questions are about how availability of farmed products might affect the market for turtle products in your OT. Remember that all information provided during this interview will be held in confidence.

70

If the following farmed turtle products were legally available for you to purchase and then resell, would you purchase them?

MEAT	YES	NO	UNSURE	NO ANSWER
EGGS	YES	NO	UNSURE	NO ANSWER
WHOLE SHELL	YES	NO	UNSURE	NO ANSWER
WORKED SHELL	YES	NO	UNSURE	NO ANSWER

71

If you had a choice between selling farmed turtle products and products from wild turtles, and BOTH WERE LEGALLY AVAILABLE to you, why would you make these choices?

MEAT	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
EGGS	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
WHOLE SHELL	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
WORKED SHELL	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER

Why would you make this choice?

72 If you had a choice between selling farmed turtle products that were legal and products from wild turtles that were illegal, which would you choose to sell?

MEAT	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
EGGS	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
WORKED SHELL	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER
WHOLE SHELL	FARMED	WILD CAUGHT	NO PREFERENCE	UNSURE	NEITHER

Why would you make this choice?

73 If farmed turtle products (meat and other products) were available to your customer, how do you think this would affect your sales?

SELL MORE	NO EFFECT	SELL LESS	UNSURE	NOT APPLICABLE

NOTES & ADDITIONAL COMMENTS

SECTION 7: TURTLE VENDOR (INDIRECT)

74

Do (did) you own or manage a business or organization that uses turtles as an advertising feature?

YESNO

Do (did) you own or manage a business or organization that uses turtles as an attraction?

YESNO

Are (were) turtles a feature of your professional activities/organisation?

YESNO

If YES to any of the above, go to Q75. If NO to all of the above, go to SECTION 8

75

What type of work do (did) you do?

76

How many staff are (were) employed in this business?

Full time

Part time

77

Please describe how you use(d) turtles in promoting your business/organisation, or as an attraction, or as a focus of your professional activities

WHERE POSSIBLE, COLLECT EXAMPLES OF WAYS IN WHICH TURTLES ARE USED IN PROMOTIONAL MATERIALS, E.G. COLLECT LEAFLETS, PHOTOGRAPH SIGNS ETC.

78

Why did you choose turtles to promote your business/organisation or as a focus of your professional activities?

79

Do (did) you, as part of your business/professional activities, keep turtles in captivity?

YESNO

If yes, how many do (did) you keep?

80

How many clients do you have in an average year?

NOT APPLICABLE

81

In an average year, how many of your clients ask specifically about turtles?

DON'T KNOW

82

Of your customers, what proportion are local people, expatriates, tourists and others? (%)

Local

%

Expatriate

%

Tourist

%

DON'T KNOW

NOT APPLICABLE

83

How often do the following groups of people specifically ask about turtles when they approach your business?

LOCAL

ALMOST ALWAYS

FREQUENTLY

INFREQUENTLY

NEVER

DON'T KNOW

NA: NOT CUSTOMERS

EXPATRIATE

ALMOST ALWAYS

FREQUENTLY

INFREQUENTLY

NEVER

DON'T KNOW

NA: NOT CUSTOMERS

TOURIST

ALMOST ALWAYS

FREQUENTLY

INFREQUENTLY

NEVER

DON'T KNOW

NA: NOT CUSTOMERS

84a

Have you noticed any changes in people’s interest in sea turtles? First of all, can you tell me if you’ve noticed a change in interest overall?

YESNO

If NO, go to Q 86

If the interviewee answers YES, you should go on to ask about changes in availability of each of the products in Q84 b&c.

84b

For each of the groups below, has interest in turtles increased, decreased or stayed the same compared to 5 years ago?

LOCAL	INCREASE	DECREASE	SAME	DK
EXPATRIATE	INCREASE	DECREASE	SAME	DK
TOURIST	INCREASE	DECREASE	SAME	DK
OTHER PEOPLE (specify)				
	INCREASE	DECREASE	SAME	DK
OTHER PEOPLE (specify)				
	INCREASE	DECREASE	SAME	DK

84c

For each of the groups below, has interest increased, decreased or stayed the same since you started your business?

INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK
INCREASE	DECREASE	SAME	DK

85

Why do you think that the level of interest in turtles has changed?

86

Are there particular characteristics of local people who ask about turtles (age, gender, income)?

87

Are there particular characteristics of tourists who ask about turtles (nationality, age, gender, income)?

88

Are there particular characteristics of expatriates who ask about turtles (nationality, age, gender, income)?

89

If turtles were no longer found in this OT (nesting or in waters) would you continue to use them in promotions or as a focus of your professional activities?

YESNO

DON'T KNOW

90

If turtles were no longer found in this OT (nesting or in waters) would use of your services increase, stay the same, or decrease?

INCREASE	STAY THE SAME	DECREASE	DON'T KNOW	NOT APPLICABLE

91

Are turtles very important, somewhat important or unimportant to your business or professional activities?

VERY IMPORTANT	SOMEWHAT IMPORTANT	UNIMPORTANT	DON'T KNOW

NOTES

SECTION 8 : TURTLE CONSUMERS

92

Have you ever consumed or used any of the following products yourself or given them as gifts to others?

MEAT	NEVER	FORMERLY	CURRENTLY
EGGS	NEVER	FORMERLY	CURRENTLY
WHOLE SHELL	NEVER	FORMERLY	CURRENTLY
WORKED SHELL	NEVER	FORMERLY	CURRENTLY
OTHER PRODUCT (specify)	NEVER	FORMERLY	CURRENTLY
OTHER PRODUCT (specify)	NEVER	FORMERLY	CURRENTLY
	If yes to ALL go to Q93	If yes to ANY go to Q94	If yes to ANY go to Q95

93

Why have you chosen NEVER to consume or use marine turtle products yourself or give them as gifts to others?

Go to SECTION 9

94

If you used to consume or use marine turtle products yourself or give them as gifts to others and no longer do, why did you stop?

94a

If you no longer use turtle products, when did you stop?

YY

95

How often do (did) you consume/use marine turtle products?

DAILY	WEEKLY	MONTHLY	YEARLY	< ONCE / YEAR	A FEW TIMES IN LIFETIME
If the interviewee's answer is one of these, continue through all of SECTION 8.				If the interviewee's answer is one of these, go to SECTION 9	

96

Do (did) you have a preference for the species of sea turtle when using turtle products?

	PREFERRED SPECIES (specify)	
MEAT		NO PREFERENCE
EGGS		NO PREFERENCE
WHOLE SHELL		NO PREFERENCE
WORKED SHELL		NO PREFERENCE
OTHER PRODUCT (specify)		NO PREFERENCE
OTHER PRODUCT (specify)		NO PREFERENCE

97 If you buy (bought) or used turtle products, when do (did) you buy or use them and, if bought, how much do (did) they cost?

	During which months do (did) you buy this product? SPECIFY MONTHS e.g. Mar-Sep	Current or latest price
MEAT		
EGGS		
WHOLE SHELL		
WORKED SHELL		
OTHER PRODUCT (specify)		
OTHER PRODUCT (specify)		

98 If you give (gave) turtle products to people as gifts, who do (did) you give them to?

	Specify species	Who do (did) you give it to?
MEAT		
EGGS		
WHOLE SHELL		
WORKED SHELL		
OTHER PRODUCT (specify)		
OTHER PRODUCT (specify)		

99 If you use or consume marine turtle products, what do you use them for and how much do you use?

	What is this used for? PLEASE INDICATE SPECIES WHERE POSSIBLE	Amount (pounds/number) / year
MEAT		
EGGS		
WHOLE SHELL		
WORKED SHELL		
OTHER PRODUCTS (specify)		

100 Where do you purchase sea turtle products? (*Check all that apply*)

HARBOUR

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

OTHER PRODUCTS

HOMES

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

MARKET

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

RESTAURANT

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

OTHER PLACE (*specify*)

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

OTHER PLACE (*specify*)

MEAT

EGGS

WHOLE SHELL

WORKED SHELL

101a Have you noticed any changes in the availability of sea turtle products available for you to buy? First of all, can you tell me if you've noticed a change in availability overall?

YES

NO

If NO, go to SECTION 9

If the interviewee answers YES, you should go on to ask about changes in availability of each of the products in Q101 b&c.

101b

For each of the products below, has availability for you to buy increased, decreased or stayed the same **compared to 5 years ago?**

MEAT

INCREASE

DECREASE

SAME

DK

EGGS

INCREASE

DECREASE

SAME

DK

WORKED SHELL

INCREASE

DECREASE

SAME

DK

WHOLE SHELL

INCREASE

DECREASE

SAME

DK

OTHER PRODUCT(*specify*)

INCREASE

DECREASE

SAME

DK

OTHER PRODUCT(*specify*)

INCREASE

DECREASE

SAME

DK

101c

For each of the products below, has availability for you to buy increased, decreased or stayed the same **since you started buying turtle products?**

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

INCREASE

DECREASE

SAME

DK

NOTES

SECTION 9: TURTLE CONSERVATION

102

Which species of turtle nest in this OT?

GENERAL

103

Which species of turtle are found in the waters of this OT?

GENERAL

104a

Have you noticed any changes in the number (abundance) of sea turtles in this OT's waters? First of all can you tell me if you've noticed a change in abundance overall?

YES

NO

If NO, go to Q105a

If the interviewee answers YES, you should go on to ask about changes in abundance of each of the species in Q104b&c

104b

For each of the species of turtle or turtles in general, have numbers in the waters increased, decreased or stayed the same compared to 5 years ago?

104c

For each of the species of turtle or turtles in general, have numbers in the waters increased, decreased or stayed the same since you can remember?

GREEN	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
LEATHERBACK	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
LOGGERHEAD	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
HAWKSBILL	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
GENERAL	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK

105a

Have you noticed any changes in the number (abundance) of sea turtles nesting on the beaches in this OT? First of all, can you tell me if you've noticed a change in abundance overall?

YES

NO

If NO, go to Q107

If the interviewee answers YES, you should go on to ask about changes in abundance of each of the species in Q105b&c

105b

For each of the species of turtle or turtles in general, have numbers of nesting turtles increased, decreased or stayed the same compared to 5 years ago?

105c

For each of the species of turtle or turtles in general, have numbers of nesting turtles increased, decreased or stayed the same since you can remember?

GENERAL	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
LEATHERBACK	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
LOGGERHEAD	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
HAWKSBILL	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK
GREEN	INCREASE	DECREASE	SAME	DK	INCREASE	DECREASE	SAME	DK

106

IF YOU HAVE NOTICED CHANGES: For each species of turtle, or for turtles in general, why do you think numbers of turtles have changed?

Reasons for change in numbers at sea and on beaches? (list as many as given)

GENERAL

LEATHERBACK

LOGGERHEAD

HAWKSBILL

GREEN

107 Can you describe any laws regarding marine turtle fishing in the OTs waters? YES NO If no go to Q 108

107a If yes, what are they?

108 Can you describe any laws regarding the purchase of marine turtle products in the OT? YES NO If no go to Q 109

108a If yes, what are they?

109 Are you aware of any activities that infringe on these laws? YES NO If no go to Q 110

109a If yes, what are they?

PLEASE REMEMBER THAT ANY INFORMATION GIVEN DURING THIS INTERVIEW IS HELD IN CONFIDENCE.

109b Who is engaged in activities that infringe on these laws? *Check all that are relevant.*

NATIVE NATURALISED RESIDENT VISITOR OTHERS (Specify) DON'T KNOW NO ANSWER

110 Do you agree, disagree, or have no opinion about each of the following statements?

Turtle fishing should be unregulated.

YES, UNREGULATED NO OPINION NO, SHOULD BE REGULATED NA: TURTLES SHOULDN'T BE FISHED

Turtles should be used as a tourist attraction rather than as a source of food.

YES, TOURIST ATTRACTION NO OPINION NO, SOURCE OF FOOD NA: TURTLES SHOULDN'T BE USED

Turtles are economically valuable in this OT.

YES, ECONOMICALLY VALUABLE NO OPINION NO, NOT ECONOMICALLY VALUABLE

Tourists should be allowed to purchase sea turtle shell and take it home with them.

YES, PURCHASE SHELL NO OPINION NO, DON'T PURCHASE NA: TURTLES SHOULDN'T BE FISHED

Tourists should be allowed to purchase sea turtle meat.

YES, PURCHASE MEAT NO OPINION NO, DON'T PURCHASE NA: TURTLES SHOULDN'T BE FISHED

Existing laws protecting marine turtles are effectively enforced.

YES, LAWS EFFECTIVE NO OPINION NO, LAWS INEFFECTIVE NA: NO LAWS IN PLACE

Some income from tourism should be used to support sea turtle conservation efforts.

YES, TOURISM SHOULD SUPPORT NO OPINION NO, TOURISM SHOULD NOT SUPPORT

Turtles should be used both as tourist attractions and as a source of food.

YES, TOURISM & FOOD NO OPINION NO, NOT TOURISM & FOOD NA: TURTLES SHOULDN'T BE FISHED

Turtles play an important ecological role in our natural environment.

YES, IMPORTANT ECOLOGICAL ROLE

NO OPINION

NO, ECOLOGICALLY UNIMPORTANT

Turtle fishing should be stopped until more information is known on the size and health of the populations.

YES, STOP & FIND OUT MORE

NO OPINION

NO, CONTINUE FISHING

NA: TURTLES SHOULDN'T BE FISHED

The government needs to do more to ensure that existing laws regarding marine turtles are effectively enforced.

YES, GOVERNMENT SHOULD DO MORE

NO OPINION

NO, GOVERNMENT DOING ENOUGH

NA: NO LAWS EXIST

Local people should be allowed to catch and eat sea turtles, provided it doesn't threaten the regional population.

YES, ALLOW LOCAL USE

NO OPINION

NO, NO LOCAL USE

NA: TURTLES SHOULDN'T BE FISHED

Turtles are culturally valuable in this OT.

YES, CULTURALLY VALUABLE

NO OPINION

NO, NOT CULTURALLY VALUABLE

The government needs to actively work to protect sea turtles.

YES, GOVERNMENT SHOULD ACTIVELY PROTECT

NO OPINION

NO, GOVERNMENT SHOULDN'T ACTIVELY PROTECT

As turtles are migratory, they should be managed in cooperation with neighbouring states.

YES, SHOULD BE MANAGED WITH NEIGHBOURS

NO OPINION

NO, SHOULDN'T BE MANAGED WITH NEIGHBOURS

Turtle fishing should be stopped completely.

YES, SHOULD BE STOPPED

NO OPINION

NO, SHOULDN'T BE STOPPED

NA: TURTLES SHOULDN'T BE FISHED

Local people should be allowed to purchase sea turtle meat.

YES, ALLOW LOCAL PURCHASE

NO OPINION

NO, NO LOCAL PURCHASE

NA: TURTLES SHOULDN'T BE FISHED

It is important that sea turtles exist in the wild in the future.

YES, IMPORTANT THAT THERE ARE WILD TURTLES

NO OPINION

NO, WILD TURTLES UNIMPORTANT

Turtles should be protected, regardless of their use to humans.

YES, SHOULD BE PROTECTED REGARDLESS

NO OPINION

NO, SHOULD NOT BE PROTECTED REGARDLESS

Do you have any general comments on turtle conservation issues that you are willing to share with us? Or do you have any questions about this study? *(Please record questions and answers here - continue on a separate sheet if necessary)*

TCOT SOCIO-ECONOMIC SURVEY RECORDING SHEET

[illegible]

Your dive operator is participating in *CARIBBEAN* **TURTLEWATCH**

Contact us:
info@tcot.seaturtle.org

**You can help gather information
about marine turtles by recording all
your sightings. Please ask your dive
operator for details.**



**MARINE CONSERVATION
SOCIETY**
www.mcsuk.org

DEFRA
Department for
**Environment,
Food & Rural Affairs**



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**MARINE
TURTLE
RESEARCH
GROUP**

This project is funded by the UK Department of Environment, Food and Rural Affairs and the Foreign and Commonwealth Office Environment Fund for the Overseas Territories as part of Turtles in the Caribbean Overseas Territories (TCOT). For more information contact us on info@tcot.seaturtle.org.



Caribbean TURTLEWATCH

What is Caribbean TURTLEWATCH?

Caribbean TURTLEWATCH is a groundbreaking new project which gives professional and leisure divers the opportunity to engage their skills in field research to learn more about the endangered marine turtle populations of the Caribbean.

Caribbean TURTLEWATCH is an integral part of Turtles in the Caribbean Overseas Territories (TCOT)*, a 3-year project which aims to assess the status of marine turtles and their exploitation in the UK Overseas Territories of Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands.

Data collected and analysed through Caribbean TURTLEWATCH will be used by the governments of the UK Overseas Territories in the Caribbean to establish effective management programmes for the conservation of these spectacular but vulnerable species.

How do I conduct a Caribbean TURTLEWATCH survey?

Participating in Caribbean TURTLEWATCH is easy. Volunteer dive operators are provided with an attractive pack containing promotional posters, leaflets, ID sheets and clear, simple-to-fill-in datasheets.

The datasheets come in an easy to use booklet. **One datasheet must be filled in by one diver for every dive, even when a turtle wasn't spotted!** Your customers may find it enjoyable to complete a datasheet themselves when they return from a dive, or alternatively you, the dive operator, can complete them after each dive.

Completed datasheets are then periodically collected by TCOT staff or can be posted to TCOT headquarters. Caribbean TURTLEWATCH packs and refills can be obtained by contacting us at

info@tcot.seaturtle.org

Your TURTLEWATCH pack includes

- A booklet of 100 datasheets
- Two of these laminated information sheets
- A laminated A3 poster for your dive shop
- A laminated A4 poster for your dive boat
- Two laminated Wider Caribbean Sea Turtle Network (WIDECAST) Turtle ID keys
- TCOT tourist awareness leaflets



What happens to my survey data after it's returned?

TCOT staff will review the completed datasheets and enter your data into a TCOT database, which is designed to be compatible with regional national biodiversity databases as well as complimentary regional initiatives such as the REEF initiative (www.reef.org/data/seaturtle.htm).

The TCOT database will be analysed to produce national as well as site-specific reports on marine turtle species distribution and population trends. Your contribution will be acknowledged in each report. The data will be made freely available to all local research programmes, conservation organisations and government agencies. At the end of each year, TCOT will send you a summary report, which will also be posted on the TCOT website.

When and where should I conduct surveys?

Caribbean TURTLEWATCH surveys should be conducted as part of your regular diving activities, i.e. anytime your operation has divers in the water. Through working with diver operators, Caribbean TURTLEWATCH has the potential to survey a great number of dive sites throughout the year and during different times of the day. This will allow TCOT to assess where turtle species are present and where they are absent.

Why marine turtles?

Marine turtle populations around the world are faced with a variety of threats including direct harvest for meat and eggs, accidental entanglement and drowning in fisheries, as well as habitat disturbance on the nesting beaches and coral reef degradation. The World Conservation Union (IUCN) lists loggerhead, green and olive ridley turtles as endangered, and hawksbill, leatherback and Kemp's ridley turtles as critically endangered. The Australian Flatback turtle is listed as vulnerable.

At present there is limited knowledge regarding trends of abundance of marine turtles at sea and very little data has been collected in most of the UK Overseas Territories in the Caribbean. Caribbean TURTLEWATCH can therefore make a significant contribution to the understanding of marine turtles in the Caribbean region.

Who is involved?

Turtles in the Caribbean Overseas Territories (TCOT) is a 3-year project funded by the UK Department of Environment, Food and Rural Affairs (DEFRA) and the UK Foreign and Commonwealth Office Environment for the Overseas Territories (FCO-EFOT). TCOT partners include: Anguilla - Department of Fisheries and the Anguilla National Trust; Bermuda - The Bermuda Turtle Project; British Virgin Islands - Conservation and Fisheries Department, BVI National Parks Trust; Cayman Islands - Department of Environment, Cayman Turtle Farm; Montserrat - Government of Montserrat, Montserrat National Trust; Turks & Caicos Islands - Department of Environment and Coastal Resources. TCOT thanks WIDECAST and Seaturtle.org for their collaboration in Caribbean TURTLEWATCH

How can I learn more about marine turtles and other marine life?

Go to the TCOT website
www.seaturtle.org/mtrg/projects/tcot/

or contact us at
info@tcot.seaturtle.org

For more info visit the following useful links:
www.seaturtle.org

The Marine Turtle Newsletter
www.seaturtle.org/mtn

The Marine Conservation Society
www.mcsuk.org

DEFRA
Department for
Environment,
Food & Rural Affairs


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**MARINE CONSERVATION
SOCIETY**
Supported by
C&G Cheltenham & Gloucester


**MARINE
TURTLE
RESEARCH
GROUP**



Caribbean **TURTLEWATCH**

PLEASE COMPLETE THIS DIVER SURVEY FORM WHETHER OR NOT YOU HAVE SEEN TURTLES ON YOUR DIVE.



OFFICE USE ONLY Report ref:

Caribbean TURTLEWATCH is part of the Turtles in the Caribbean Overseas Territories (TCOT) initiative, funded by the UK Government.

Thank you for donating your valuable time to this project.

About the divers If you are a customer rather than a member of staff, please provide your name and address in the space provided.

DIVE OPERATOR

DIVE MASTER

NUMBER OF DIVERS

REPORTER'S NAME

REPORTER'S POSTAL ADDRESS

POSTAL/ZIP CODE

E-MAIL

Personal details may be used to verify information. If you do not wish to receive feedback/reports from this survey, please tick this box. ☐

About the dive Please indicate whether you are using feet & inches ☐ or metres & centimetres ☐

DIVE DATE

D D M M Y Y

TIME IN

:

TIME OUT

:

DIVE SITE

MOORING SITE

MAXIMUM DEPTH

BOTTOM TIME

VISIBILITY

WATER TEMPERATURE

Please indicate if °F or °C

AT SURFACE

AT BOTTOM

About the turtles DID YOU SEE ANY TURTLES ON THIS DIVE? YES ☐ NO ☐

Please give details of each turtle seen on a separate line and continue on an additional sheet if necessary.

SPECIES	ESTIMATED SHELL LENGTH	DEPTH	ID CERTAINTY (Please tick)
			☐ v sure ☐ sure ☐ not sure
			☐ v sure ☐ sure ☐ not sure
			☐ v sure ☐ sure ☐ not sure
			☐ v sure ☐ sure ☐ not sure

Please use the ID key overleaf and ask your dive operator for a copy of the Wider Caribbean Sea Turtle Network (WIDECAST) ID key if you would like more information.

WERE THERE ANY VISIBLE TAGS ON THE TURTLE(S)? YES ☐ NO ☐

TAG DETAILS

NOTE: Only read details on tags if you can do so without causing distress to the turtle. Never remove tags from a live turtle.

About the experience This section should be completed with one of the divers on this dive.

DID THE CHANCE OF SEEING A TURTLE INFLUENCE YOUR DECISION TO CHOOSE THIS PARTICULAR DIVE?

☐ YES

☐ NO

☐ UNSURE

HOW IMPORTANT WAS YOUR TURTLE SIGHTING TO THE ENJOYMENT OF THE DIVE?

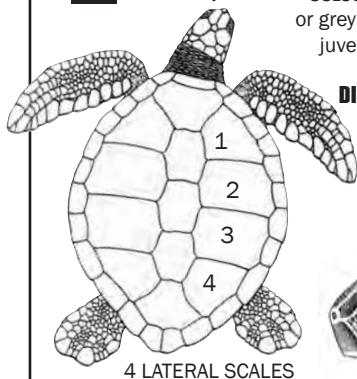
☐ VERY IMPORTANT

☐ IMPORTANT

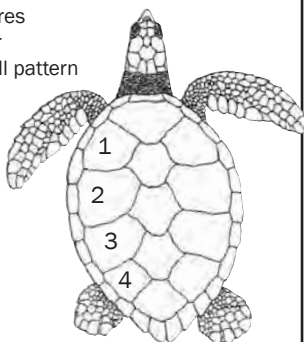
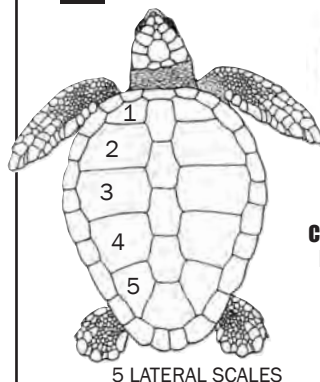
☐ NOT IMPORTANT

1**Green turtle***Chelonia mydas***LENGTH:** up to 1.5 metres**COLOUR:** adults dark olive or grey with dark blotches, juveniles have chestnut coloured shell**DISTINCTIVE FEATURES:**

smooth shell, non-overlapping scales, rounded (not angular) facial profile

**3****Hawksbill turtle***Eretmochelys imbricata***LENGTH:** up to 1.2 metres**COLOUR:** brown, amber and black tortoiseshell pattern**DISTINCTIVE FEATURES:**

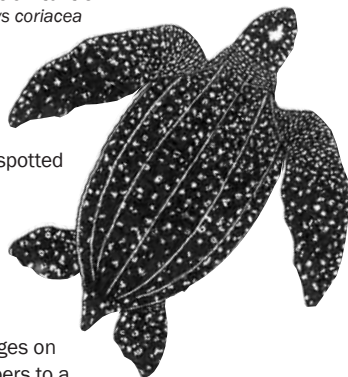
shell scales overlapping, serrated posterior shell, narrow tapered head with bird-like beak

**2****Loggerhead turtle***Caretta caretta***LENGTH:** adults up to 1.5 metres**COLOUR:** reddish brown**DISTINCTIVE FEATURES:**

large head, markedly thick shell and non-overlapping scales

4**Leatherback turtle***Dermochelys coriacea***LENGTH:** adults up to 2 metres**COLOUR:** black, spotted with white**DISTINCTIVE FEATURES:**

large, up to 500 kg, pronounced longitudinal ridges on shell, which tapers to a blunt point



Other turtle species are occasionally sighted in the Caribbean. If you see a turtle that you believe is none of the above, please clearly indicate below what makes it different from the four species shown here.

ANY OTHER NOTES. (e.g. What the turtle was doing: feeding, swimming, resting etc. distinguishing marks and anything else worthy of note.)

Please give your completed form to your dive operator or mail it to TCOT, Marine Turtle Research Group, School of Biological Sciences, University of Wales, Swansea SA2 8PP United Kingdom

Illustrations are taken from: Eckert, K.L., K.A. Bjorndal, F.A. Abreu-Grobois, and M. Donnelly (Editors). 1999. *Research and Management Techniques for the Conservation of Sea Turtles*. IUCN/SSC Marine Turtle Specialist Group Publication No. 4.



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ANGUILLA

REVISED STATUTES OF ANGUILLA

CHAPTER F40

FISHERIES PROTECTION ACT

Showing the Law as at 15 December 2000

Published by Authority

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ANGUILLA

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FISHERIES PROTECTION ACT**TABLE OF CONTENTS****SECTION**

1. Interpretation
2. Application of Act and jurisdiction of Magistrate
3. Fisheries officers
4. Powers of authorised officers
5. Protection of authorised officers
6. Assault, etc., of authorised officers
7. Regulations
8. Sale of perishable matter
9. Disposal of property forfeited
10. Disposal of property not forfeited
11. Burden of proof
12. Citation

SCHEDULE: Fisheries Zone

FISHERIES PROTECTION ACT**Interpretation****1.** In this Act—

“authorised person” means a person referred to as such in section 3;

“fishery limits” means the area of the territorial sea of Anguilla and the fisheries zone contiguous thereto established by the Proclamation made the 6th day of November, 1981 set out in the Schedule;

“fisheries officer” means a person appointed as such under section 3;

“marine product” includes any fish, aquatic animal and vegetable matter living in water, turtles, coral, cetacea, crustacea or molluscs;

“vehicle” includes aircraft;

“vessel” includes hovercraft.

Application of Act and jurisdiction of Magistrate

2. This Act shall apply to Anguilla and to the fishery limits and, for the avoidance of doubt, it is hereby declared that the Magistrate’s Court shall have jurisdiction in relation to proceedings for any offence against this Act, or any regulations made hereunder which is committed within the fishery limits.

Fisheries officers

3. The Governor may from time to time by notice published in the *Gazette* appoint such fisheries officers as may be requisite, one of whom shall be designated as Chief Fisheries Officer.

Powers of authorised officers

4. (1) Every fisheries officer, police officer, and member of the armed forces of Her Majesty, (hereinafter in this Act referred to as an “authorised person”) shall have and may exercise the following powers without a warrant—

- (a) to stop, board and search using such force as is reasonably necessary any vessel within the fishery limits;
- (b) to require to be produced or examined and to take copies of any licence required under this Act or any regulations made hereunder, or any certificate of registry, customs clearance, ship’s log, passenger list, crew list, manifest, bill of lading or other official document relating to the vessel;
- (c) to require the master of any vessel to appear and to make explanation concerning the vessel and her crew or any other persons on board;
- (d) to make any examination or enquiry which he deems necessary to ascertain whether any offence under this Act or any regulations made hereunder has been committed;
- (e) where he has reasonable grounds to believe that an offence under this Act or any regulations made hereunder has been, is being or is about to be committed to enter and search, using such force as is reasonably necessary, any vehicle or any premises, other than premises used exclusively as a dwelling house, and seize therein anything appearing to him to be connected with the commission of any such offence and to seize any vessel, vehicle or any other property appearing to him to be used or to have been used in connection with any such offence.

(2) Any vessel or other thing seized under the provisions of this section and any person on board shall be taken to the nearest or most convenient port or to a police station in Anguilla and the vessel and any other thing and the persons on board may be detained.

(3) Any authorised person, if he has reasonable cause to suspect that an offence against this Act or any regulations made hereunder has been committed, pursue a vessel beyond the fishery limits and the powers conferred by this Act shall be exerciseable beyond the fishery limits to the extent recognised by international law.

(4) A fisheries officer shall produce on demand from any person reasonably requiring him to do so such means of identification as may be necessary to show that he is a fisheries officer.

Protection of authorised officers

5. No action shall lie against any authorised person in respect of anything done or omitted to be done by him in good faith in the exercise of powers conferred under section 4.

Assault, etc., of authorised officers

6. Any person who—

- (a) assaults or obstructs any authorised person while acting in the exercise of his powers under this Act; or
- (b) refuses or neglects to comply with any requisition or direction lawfully given, or refuses to answer any question lawfully put, by an authorised person;

is guilty of an offence and is liable on summary conviction to a fine of \$10,000 or to imprisonment for 1 year or to both

Regulations

7. (1) The Governor may make regulations generally for the protection, management and development of fisheries resources.

(2) Without prejudice to the generality of subsection (1), the Governor may make regulations providing for all or any of the following purposes—

- (a) prohibiting, restricting or regulating the taking, capturing, killing or destroying of any kind of species of marine product or of any kind or species of marine product of any specified size or description within the fisheries limits either generally or at any particular time or in any particular area;
- (b) providing for the granting and revocation of licences, containing such conditions as may be specified, for the taking, capturing, killing or destroying of all or any species of marine product;
- (c) restricting, regulating or controlling the methods and apparatus used in connection with the taking, capturing, killing or destroying of any species of marine product;
- (d) prohibiting, restricting, regulating or controlling the marketing or exporting of any species of marine product or of any particular class or grade of marine product whether in a manufactured state or not;
- (e) prohibiting, restricting, regulating or controlling the curing, canning, processing or manufacturing of any species of marine product and the grading thereof, and in particular specifying the type, size or grade of marine product to be cured, canned, processed or manufactured;
- (f) providing for the examination or inspection of all or any species of marine product taken, captured, killed or destroyed;
- (g) providing for the examination or inspection of any net, gear, boat or apparatus used in connection with the taking, capturing, killing or destroying of any species of marine product;
- (h) prescribing any other matter which is required or authorised to be prescribed;
- (i) providing for the charging and collection of fees, royalties or charges for licences issued under regulations made under this Act.

(3) Regulations made under this section may provide that the breach of any regulation made under this section shall be an offence and may provide for forfeiture of any vessel, or marine product or any other thing connected with any such offence and for penalties on summary conviction consisting of a fine not exceeding \$50,000 and imprisonment for 1 year for a first offence, or a fine of \$250,000 and imprisonment for 2 years for a second or subsequent offence.

Sale of perishable matter

8. (1) Any marine product or other property of a perishable nature seized under this Act may, at the direction of the Chief Fisheries Officer, be sold and the proceeds of sale shall be held and dealt with as if the same were property seized under the provisions of this Act.

(2) Where, after making all reasonable efforts, the Chief Fisheries Officer is unable to sell the marine product or other property referred to in subsection (1), or where the same is unfit for sale, the Chief Fisheries Officer may dispose of it or any part of it, in such manner as he thinks fit.

Disposal of property forfeited

9. Anything ordered to be forfeited under this Act or any regulations made under this Act shall be disposed of in such manner as the Governor may direct.

Disposal of property not forfeited

10. Anything seized under and in accordance with the provisions of this Act which is not ordered to be forfeited shall be returned to the person from whom it was seized or any other person who appears to the Governor to be entitled to receive it, but, where the person from whom such thing was seized is not in Anguilla and no other person in Anguilla appears to the Governor to be entitled to receive such thing, the Chief Fisheries Officer shall publish in the *Gazette* a notice stating that unless the person from whom the thing was seized or any other person entitled to receive it submits to the Governor a claim in writing for the return of the thing to him within 3 months of the date of the notice, the thing will be deemed to have been forfeited and may be dealt with in accordance with section 9.

Burden of proof

11. In any proceedings for an offence under this Act or any regulations made hereunder, the onus of proving that a licence issued under regulations made under this Act was in force authorising the defendant to do any act shall be upon the defendant.

Citation

12. This Act may be cited as the Fisheries Protection Act, Revised Statutes of Anguilla, Chapter F40.

SCHEDULE

(Section 1)

FISHERIES ZONE**STATUTORY RULES AND ORDERS**

1981 No. 28

Proclamation establishing a fisheries zone contiguous to the territorial sea of Anguilla.

BY HER MAJESTY'S COMMISSIONER IN ANGUILLA

A PROCLAMATION

Charles Henry Godden
Her Majesty's Commissioner

I, Charles Henry Godden, Her Majesty's Commissioner in Anguilla, acting in pursuance of instructions given by Her Majesty through a Secretary of State, DO HEREBY PROCLAIM AND DECLARE that –

1. There is established for Anguilla a fisheries zone contiguous to the territorial sea of Anguilla.
2. The said fisheries zone has as its inner boundary the outer limits of the territorial sea of Anguilla and as its seaward boundary a line drawn so that each point on the line is two hundred nautical miles from the nearest point on the low-water line on the coast or other baseline from which the territorial sea is measured, or, unless another line is declared by Proclamation, the median line where this is less than two hundred nautical miles from the baseline. The median line is a line every point of which is equidistant from the nearest points of the baseline of Anguilla and the corresponding baselines of other countries or territories.
3. Her Majesty will exercise the same jurisdiction in respect of fisheries in the said fisheries zone as She has in respect of fisheries in the territorial waters of Anguilla subject to such provisions as may hereafter be made by law for the control and regulation of fishing within the said zone.

Given under my hand this 18th day of November, 1981

GOD SAVE THE QUEEN



ANGUILLA

REVISED REGULATIONS OF ANGUILLA

under

FISHERIES PROTECTION ACT R.S.A. c. F40

Showing the Law as at 15 December 2000

Regulation	Citation	Page
FISHERIES PROTECTION REGULATIONS	R.R.A. F40-1	3

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Revised Regulations of Anguilla: F40-1

FISHERIES PROTECTION ACT (R.S.A. c. F40)**FISHERIES PROTECTION REGULATIONS**

Note: These Regulations are enabled under section 7 of the Fisheries Protection Act, R.S.A. c. F40.

TABLE OF CONTENTS**PART 1****PRELIMINARY****SECTION**

1. Interpretation
2. Application

PART 2**LICENSING AND REGISTRATION PROVISIONS**

3. Taking, processing, etc., marine products without a licence
4. Vessel used for commercial or sport fishing to be licenced
5. Issue of licences, etc.
6. Categories of licences to be issued by the Minister
7. Restriction on purchase of marine products
8. Returns of certain licence holders
9. Registration of fish merchants

PART 3**CONSERVATION PROVISIONS**

10. Prohibitions relating to taking marine products and to harmful activities
11. Close seasons
12. Prohibited areas
13. Legal size
14. Restrictions relating to crayfish and lobster
15. Fishpots and traps
16. Mesh size of nets
17. Prohibition on taking turtles, etc.
18. Prohibition on use of gillnets

PART 4

FISH AGGREGATING DEVICES

19. Fish aggregating devices
20. Designated aggregating devices
21. Working of fish aggregating devices

PART 5

FISHERIES MANAGEMENT AND DEVELOPMENT

22. Fisheries management and development plan
23. Fisheries Advisory Committee
24. Research
25. Fisheries access agreements
26. Storage of gear
27. Transshipment of catch

PART 6

ENFORCEMENT AND MISCELLANEOUS PROVISIONS

28. Search warrant
29. Forfeiture
30. Penalty for interfering with fishery protection equipment
31. General penalty
32. Citation

SCHEDULE 1: Forms

SCHEDULE 2: Licence Fees

SCHEDULE 3: Close Season

SCHEDULE 4: Prohibited Areas

SCHEDULE 5: Minimum Legal Size for Lobster

SCHEDULE 6: Minimum Size of Marine Products

SCHEDULE 7: Minimum Mesh Size of Nets

SCHEDULE 8: Designated Fish Aggregating Devices

PART 1

PRELIMINARY

Interpretation

1. In these Regulations—

“Act” means the Fisheries Protection Act;

“close season”, in relation to any particular species or marine product, means the close season for that species provided by regulation under the provisions of section 11;

“commercial fishing” means fishing carried on wholly or partly for financial reward or other material gain;

“crayfish” means the lobster of the species *panulirus guttatus*;

“export” includes the transport of any marine product taken in the fishery limits to a place outside Anguilla whether or not it has previously been imported into Anguilla;

“fish aggregating device” means any apparatus or device designed or intended for use in attracting any marine product into a particular area or for facilitating fishing for any marine product;

“fishing” includes catching, taxing or killing any marine product by any means or method, placing or retrieving any fish aggregating device and searching for any marine product for the purpose of fishing;

“fishing vessel” means any vessel used for commercial fishing or related activities and includes a sport fishing vessel;

“foreign fishing vessel” means any fishing vessel other than a local fishing vessel;

“issuing authority”, in relation to a licence, means the authority empowered to issue that particular licence under the provisions or section 5;

“legal size”, in relation to any particular species of marine product, means the minimum size permitted for the taking or possession of that species as provided in section 13;

“licence” means a licence issued under the provisions of these Regulations;

“lobster” means the spiny lobster of the species *panulirus argus*;

“local fishing vessel” means any fishing vessel—

- (a) wholly owned by the Government or by any public corporation established by or under any law;
- (b) wholly owned by one or more persons who are residents of Anguilla; or
- (c) wholly owned by any company, society or other association incorporated or established under the law of Anguilla of which at least 75% of the voting shares are held by residents of Anguilla;

“Minister” means the Minister responsible for fisheries;

“overall length”, in relation to a vessel, means the length measured from the foremost part of the hull over the deck to the rearmost part of the hull and includes any extension to the hull in the form of a bow or transom platform;

“process” means the manufacturing (including the use of any manufacturing process), bottling, canning, curing, freezing, preparing or preserving of any marine product for commercial purposes, but cleaning and chilling marine products are deemed not to constitute processing;

“prohibited apparatus” or “prohibited method”, in relation to any particular species of marine product, means any apparatus or method prohibited to be used for the taking of that species of marine product by these Regulations or which is declared to be a prohibited apparatus or method by the Minister by regulation;

“prohibited area” means any area within the fishery limits declared as such under section 12;

“registered fish merchant” means a person registered as such under section 9;

“resident” means a natural person who—

- (a) belongs to Anguilla within the meaning of the Constitution of Anguilla;
- (b) holds or is included in a current permanent residence permit; or
- (c) is, for the time being, ordinarily resident in Anguilla;

“scuba equipment” includes any self-contained underwater breathing apparatus other than a snorkel;

“snorkel” means a device comprising a tube not more than 18 inches long which enables any person, whilst completely or partially submerged beneath the water, to breathe natural air without the use of a compressor or any other artificial breathing apparatus or substitute for natural air;

“sport fishing” means fishing, with rod and line only, for any pelagic species of marine product for pleasure or recreation and not for gain or reward by any person holding a sport fishing licence;

“sport fishing vessel” means a vessel used for sport fishing;

“taking”, in relation to any particular species of marine product, includes capturing, destroying or in any manner killing that species of marine product.

Application

2. These Regulations shall apply to Anguilla and to the fishery limits.

PART 2

LICENSING AND REGISTRATION PROVISIONS

Taking, processing, etc., marine products without a licence

3. (1) Subject to the provisions of subsection (2), any person who, not being the holder of, and acting in conformity with the conditions of, a licence authorising him so to do—

- (a) engages in fishing; or

- (b) processes or exports any species of marine product;

is guilty of an offence and is liable on summary conviction to a fine of \$50,000 or to imprisonment for 1 month or to both.

- (2) Notwithstanding that he is not the holder of a licence authorising him to do so—

- (a) a resident (except during any close season for that species of marine product or in a prohibited area or by a prohibited apparatus or method) may engage in sport fishing and may take or process reasonable quantities of any species of marine product as trophies or for consumption by himself or in his home; and
- (b) any person proceeding to a place outside Anguilla, upon payment of any export duty payable under any law for the time being in force, may take with him one fish of unlimited weight for the purpose of mounting as a trophy or not more than a total of 15 lbs. weight of fish or other marine products without being the holder of an export licence.

Vessel used for commercial or sport fishing to be licenced

4. (1) Any person who uses a vessel for fishing, including commercial fishing or sport fishing, unless that vessel is licenced for that purpose, is guilty of an offence and is liable on summary conviction to a fine of \$50,000 or to imprisonment of 1 month or to both.

(2) Any person who uses, for the purposes mentioned in subsection (1), any vessel in respect of which a licence is in force shall display the number of the licence in a prominent place on the vessel, and upon failure to do so is guilty of an offence, but the Chief Fisheries Officer may direct in particular cases the manner in which the licence number shall be displayed.

(3) Subsection (1) shall not apply to a resident using a vessel for sport fishing pursuant to section 3(2)(a), where such fishing is not done for profit or reward or in furtherance of any hire or charter arrangement of any such vessel.

Issue of licences, etc.

5. (1) The authority for the issue of a licence under these Regulations shall be—

- (a) the Governor, in respect of a licence—
 - (i) for commercial fishing which is to be issued to a person who is not a resident (hereinafter referred to as a “Foreign Fisherman’s Licence”), or
 - (ii) for the taking and export of any species of marine product alive for use in any aquarium (hereinafter referred to as an “Aquarium Collecting Licence”); or
- (b) the Minister, or any person authorised by him in that behalf, in the case of any licence mentioned in section 6.

(2) An application for a licence shall be made in the form applicable thereto as prescribed in Schedule 1 and in the case of an application for the licensing of a vessel, the application shall be made by the person to whom the licence, if granted, is to be issued.

(3) A licence granted by the Governor shall be in the form applicable thereto as prescribed in Schedule 1 and shall be for such period and may be made subject to such restrictions or conditions, including the payment of fees or royalties, as the Governor may consider desirable, and may be subject to revocation on breach of any such restrictions or conditions, including failure to pay any fees or royalties.

(4) A licence granted by or on behalf of the Minister, unless previously suspended or revoked, shall be valid from the date of issue to the 31st day of July next ensuing and may be issued or renewed on payment of the fee for that category of licence specified in Schedule 2 and shall be subject to such restrictions or conditions and shall be in the form applicable thereto as prescribed in Schedule 1.

(5) On the grant or revocation of a licence issued by the Governor under these Regulations, the licence or notice of its revocation, as the case may be, shall be published in the *Gazette*, giving the name of the licensee and the type of licence.

(6) In any proceedings for an offence under these Regulations, the *Gazette* in which a licence or notice of revocation of a licence is published shall be *prima facie* evidence of the issue of the licence and of the restrictions and conditions thereof or, as the case may be, of the revocation thereof.

(7) A licence issued under these Regulations shall not be assigned without the consent of the issuing authority and the issue or renewal of a licence in any particular case shall be in the discretion of the issuing authority, but in the case of the refusal to issue or renew a licence by a person authorised to issue licences on behalf of the Minister, the applicant may require that the application be referred to the Minister who, after hearing the applicant, may confirm the refusal or may authorise the issue or renewal of the licence as the circumstances appear to him to require.

(8) No licence shall be deemed to permit fishing for or taking of any marine product in any prohibited area or during a close season or by the use of any prohibited apparatus or method.

Categories of licences to be issued by the Minister

6. (1) Licences which may be issued by the Minister shall be of the following categories—

- (a) Commercial Fisherman's Licence, authorising a person resident in Anguilla to engage in commercial fishing in any area of the fishery limits, other than a prohibited area, and to export and to sell or otherwise dispose of for gain the marine products taken;
- (b) Sport Fishing Licence, authorising a person not resident in Anguilla to engage in sport fishing in any area of the fishery limits, other than a prohibited area, and to retain for personal or domestic consumption or as trophies reasonable quantities of the marine products taken;
- (c) Fishing Vessel Licence, authorising the use of a foreign fishing vessel or a local fishing vessel for commercial fishing by the holder of a Commercial Fisherman's Licence, or a Foreign Fisherman's Licence, but a fishing vessel licence shall not be issued unless the Minister is satisfied that the vessel concerned is safe and fit for the type of commercial fishing for which it is intended to be used;
- (d) Sport Fishing Vessel Licence, authorising the use of the particular vessel for the purpose of sport fishing;
- (e) for the processing or exporting of any species of marine product (hereinafter referred to as a "Process or Export Licence").

(2) An application for renewal of a licence, which may be granted by the Minister, shall be made in Form 14 in Schedule 1 unless in the opinion of the Minister, or a person authorised by him under section 5(1)(b), the circumstances under which the licence was first granted have changed to such an extent that it is desirable that the applicant should apply for a new licence.

Restriction on purchase of marine products

7. (1) No person shall purchase any species of marine product, whether for processing or for consumption by himself or any other person, from any person who is not the holder of a Commercial Fisherman's Licence or,

in the case of any such marine product which has been processed in Anguilla, of a licence to process that species of marine product.

(2) Any person who purchases any marine product in contravention of the provisions of subsection (1), and any person who, not being the holder of a Commercial Fisherman's Licence, or a licence to process that species of marine product, who sells or offers or exposes for sale any marine product, is guilty of an offence, but this section shall not apply to the sale by or purchase from a person registered as a fish merchant to or by a hotel, restaurant, shop or similar commercial establishment, of any marine product previously purchased from the holder of a Commercial Fisherman's Licence or a licence to process that species of marine product or a marine product not taken from the fishery limits, which has been lawfully imported into Anguilla from a place outside Anguilla.

Returns of certain licence holders

8. (1) If so required by the Minister by notice in writing, the owner of any vessel licensed under these Regulations, or, if the vessel is operated by a person other than the owner, that person, shall furnish to the Minister, in such form and at such intervals as the Minister may direct, a return recording catch and effort statistics relating to the operation of the vessel.

(2) The master of such vessel shall, while in the fisheries zone, allow any person designated in writing by the Minister to board and remain on board the vessel as an observer and shall—

- (a) allow the observer full access to all equipment, including navigation and communication equipment, records, documents and to any fish on board the vessel;
- (b) allow the observer to make such tests, observations and records and to take and remove such samples as he may reasonably require to ascertain the vessel's activities in the fisheries zone; and
- (c) provide, without charge, food and accommodation at least equivalent to that provided for officers of the vessel.

(3) Any person who fails to make or furnish any return in conformity with the directions of the Minister or fails to comply with any other provision of this section is guilty of an offence.

Registration of fish merchants

9. (1) Any person who, not being the holder of a Commercial Fisherman's Licence, engages in the sale for gain or reward (otherwise than in the course of his business as a shop keeper, hotelier or restaurateur) of any marine products taken by the holder of such licence, shall cause his name to be entered as a registered fish merchant on a register to be maintained by the Chief Fisheries Officer.

(2) If so required by the Minister by notice in writing, a registered fish merchant shall furnish to the Minister, in such form and at such intervals as the Minister may direct, a return giving information as to the type and quantity of marine products bought and sold by the merchant, the names of the persons from and to whom such marine products were purchased and sold and such other information connected with the registered fish merchant's activities as such, as the Minister may reasonably require.

(3) A registered fish merchant who fails to make a return in conformity with the directions of the Minister is guilty of an offence.

PART 3

CONSERVATION PROVISIONS

Prohibition relating to taking marine products and to harmful activities

10. (1) No person shall—

- (a) save as hereinafter provided, use any explosive, poison, lime or other noxious substance or material with intent to take any marine product;
- (b) unless he is resident, use scuba equipment when taking marine products;
- (c) use any artificial breathing apparatus, other than scuba equipment or a snorkel, when taking marine products;
- (d) unless he is a resident, use any spear gun for the taking of marine products, or have a spear gun in his possession while swimming or boating; or
- (e) possess any noxious substance, being bleach or other substance containing or comprising sodium hypochlorite or chlorine, within the fishery limits with intent to use the same to take any marine product.

(2) Where any noxious substance, being bleach or other substance containing or comprising sodium hypochlorite or chlorine, is found upon any vessel in the fishery limits, it shall be deemed, unless the contrary is proved, that it was intended to be used for the purpose of taking marine products, contrary to the provisions of paragraph (1)(e).

(3) Every person found aboard that vessel shall be deemed, unless the contrary is proved, to have been in possession at all relevant times of the noxious substance specified in subsection (2).

(4) No person shall, except with the express permission in writing of the Governor, and subject to such conditions, including monetary payment, as he may impose, use any explosive, or any poisonous, noxious or other substance or any device potentially harmful to marine life to remove, dissolve, shift or in any way disturb any coral, sand, rock or other substance or any wreck, within the fishery limits or on the foreshore adjacent thereto.

(5) Any person who contravenes any of the provisions of this section is guilty of an offence.

Close seasons

11. (1) The close season for a particular species of marine product set out in Column 1 of Schedule 3 shall be generally throughout the fishery limits or in a particular area or areas as specified opposite in Column 2 of that Schedule during the period set out opposite in Column 3 of that Schedule.

(2) Any person who takes any marine product during a period which is a close season for that species of marine product is guilty of an offence.

Prohibited areas

12. (1) The area of the fishery limits set out in Column 1 of Schedule 4 is declared to be an area where the taking of a particular species of marine product or all species of marine products, or the taking of a particular species of marine products or all species of marine product, or by a particular means, or the deposit of conch shells or other matter as specified in Column 2 of that Schedule, is prohibited.

- (2) Any person who fails to comply with subsection (1) is guilty of an offence.

Legal size

13. (1) Any person who takes or is in possession of any marine product smaller than the legal size is guilty of an offence.

- (2) For the purpose of this section, "legal size" means in relation to—

(a) lobster (*panulirus argus*)—

- (i) when whole, a carapace length of 95 mm (3.74") measured from the front of the groove between their rostral horns between the eyes along the middle of the back to the rear edge of the carapace or back shell as illustrated in the diagram in Schedule 5, or
- (ii) when the tail has been separated, a tail weight of 200 g (7.05 ozs.) whether processed or not;

(b) conch (*strombus gigas*)—

- (i) a minimum shell length of 18 cm (7.08") measured from the spiral tip to the foremost edge, and
- (ii) conch meat, when removed from the shell, of a total weight of 225 g (7.94 ozs.) after the removal of the digestive gland; and

(c) a species of marine product, other than a marine product referred to in paragraph (a) or (b), specified in Column 1 of Schedule 6 that is less than the size specified opposite in Column 2 of that Schedule.

Restrictions relating to crayfish and lobster

14. (1) No person shall—

- (a) take any crayfish or lobster, or be in possession of any crayfish or lobster, taken by means of a speargun, harpoon or hook of any description, or by any other means which does not permit the return to the sea of the crayfish or lobster alive and unharmed after it has been examined at the surface;
- (b) take or be in possession of any egg-bearing crayfish or lobster;
- (c) strip or in any manner molest any egg-bearing crayfish or lobster in order to remove the eggs; or
- (d) take or be in possession of any moulting or soft-shelled crayfish or lobster which is in the early stages of spawning (when described as appearing to be tar-spotted).

(2) Any person who finds in any trap which he operates any crayfish or lobster which is egg-bearing or otherwise prohibited from being taken shall forthwith remove the crayfish or lobster from the trap and return it to the water free and unharmed.

(3) Any person taking crayfish or lobster shall ensure that the crayfish or lobster remain in whole condition after being taken until landed at that place in Anguilla where they are to be sold or used for personal or domestic consumption unless they are processed at sea by the holder of and in accordance with the terms of a Process or Export Licence.

- (4) Any person who contravenes the provisions of this section is guilty of an offence.

Fishpots and traps

15. (1) Any person who is the holder of a Foreign Fisherman's Licence or a Commercial Fisherman's Licence and who uses pots or traps for the purpose of taking marine products shall identify his pots or traps and any buoy or marker used in connection therewith by marking them conspicuously with the number of the Foreign Fisherman's Licence or the Commercial Fisherman's Licence which he holds.

(2) No person shall without lawful excuse (the proof whereof shall be upon him) handle, touch or in any way interfere with any pot or trap of another person.

(3) No person shall use any fish pot or trap for the purpose of taking any marine product unless the fish pot or trap is constructed with a mesh size of not less than 1.5 ins. across the minimum mesh dimension.

- (4) A person who contravenes any of the provisions of this section is guilty of an offence.

Mesh size of nets

16. (1) Any person who, for the purpose of taking any marine product, uses a net with a mesh size smaller than the minimum mesh size prescribed for that type of net in Schedule 7 is guilty of an offence.

(2) For the purposes of this section "net" includes a cast, seine, purse-seine, trawl, lift, gill or trammel net.

Prohibition on taking turtles, etc.

17. (1) Notwithstanding anything in these Regulations, any person who—

- (a) takes or attempts to take or causes to be taken any turtle;
- (b) slaughters or buys, sells, exposes for sale or has in his possession the whole or a portion of the meat of a turtle; or
- (c) takes or attempts to take, buys, sells or exposes for sale or has in his possession any turtle egg;

is guilty of an offence.

(2) Any person who contravenes the provisions of subsection (1) is liable on summary conviction to a fine of \$50,000 and to imprisonment for 1 year for a first offence or to a fine of \$250,000 and imprisonment for 2 years for a second or subsequent offence and any vessel, marine product or any other thing connected with any such offence is liable to be forfeited, but a person shall not be liable to imprisonment where an offence is committed in the Exclusive Economic Zone.

- (3) This section shall remain in force for a period 5 years from the 15th December, 2000.

Prohibition on use of gillnets

18. (1) No person shall use any gillnet for the purpose of taking any marine product.

- (2) Any person who contravenes the provisions of this section is guilty of an offence.

PART 4

FISH AGGREGATING DEVICES

Fish aggregating devices

19. (1) No person shall place any fish aggregating device in the fishery limits without the express written permission of the Minister and in accordance with the terms of such permission.

(2) Any application for permission to place a fish aggregating device shall be made to the Minister in writing specifying the intended location and nature of the device.

(3) On consideration of any application under this section, the Minister may either grant or refuse such permission or may grant permission for such term and subject to such conditions, including the payment of a fee, as he may think fit.

(4) A person who contravenes the provisions of this section is guilty of an offence.

Designated aggregating devices

20. (1) A fish aggregating device set out in Schedule 8 is a “designated fish aggregating device”.

(2) No person, other than the person to whom permission to place the fish aggregating device has been given, may fish within a radius of one-half of a nautical mile of a designated fish aggregating device without the written permission of the Minister acting after consultation with the Fisheries Advisory Committee.

(3) Any person who contravenes the provisions of this section is guilty of an offence.

Working of fish aggregating devices

21. (1) Any fish aggregating device placed in the fishery limits shall be at all times—

- (a) clearly marked with the name of the vessel from which it was placed;
- (b) equipped with a radar reflector and lights visible at night from a distance of at least 5 miles;
and
- (c) equipped with such equipment and marked in such manner as may be prescribed by the Minister.

(2) Any person who contravenes the provisions of this section is guilty of an offence.

PART 5

FISHERIES MANAGEMENT AND DEVELOPMENT

Fisheries management and development plan

22. (1) The Chief Fisheries Officer shall prepare and keep under review a plan for the management and development of fisheries.

(2) The fisheries management and development plan shall—

- (a) identify each fishery and assess the present state of its exploitation;
- (b) specify the objectives to be achieved in the management of each fishery;
- (c) specify the management and development measures to be taken; and
- (d) specify the licensing programmes to be followed for each fishery, the limitations, if any, to be applied to local fishing operations and the amount of fishing, if any, to be allocated to foreign fishing vessels.

(3) In the preparation and review of the fisheries plan, the Chief Fisheries Officer shall consult with fishermen resident in Anguilla, wholesalers, retailers, exporters and importers of marine products, other bodies or persons affected by the fishery plan and with the Fishery Advisory Committee established under section 23.

(4) The fishery plan and each review thereof shall be submitted to the Minister for approval.

Fisheries Advisory Committee

23. (1) There shall be a Fisheries Advisory Committee consisting of the Chief Fisheries Officer (who shall be chairman) and up to 5 other members appointed by the Governor by notice published in the *Gazette*.

(2) Appointed members of the Fisheries Advisory Committee shall hold office for such period not exceeding 3 years as may be specified in their notice of appointment.

(3) The functions of the Fisheries Advisory Committee shall be to advise the Governor or the Minister (as the case may be) on the exercise of their respective functions under the Act and these Regulations and as to the management and development of fisheries.

Research

24. (1) On application in writing, the Governor may from time to time grant permission for any person, body or organisation to take marine products for the purpose of scientific research.

(2) Any permission granted under this section may be subject to such conditions as to the Governor may seem requisite and may be revoked by the Governor at any time.

Fisheries access agreements

25. (1) The Governor may enter into access agreements with other states and with associations representing foreign fishing vessel owners or charterers, providing for the allocation of fishing rights to vessels from those states or associations.

(2) The fishing rights allocated under agreements entered into under this section shall not exceed the total resources or amount of fishing allowed to the appropriate category of foreign fishing vessels under the fisheries plan.

(3) Any agreement entered into under this section shall include a provision establishing the responsibility of the foreign state or association to take necessary measures to ensure compliance by its vessels with the terms and conditions of the agreement and with the laws relating to fishing in the fishery waters.

(4) For the purposes of this section, the term “state” shall include any regional organisation to which the power to negotiate access agreements has been delegated by the member countries.

Storage of gear

26. (1) At anytime when a commercial fishing vessel or a sport fishing vessel is within the fishery limits, all fishing equipment on board such vessel shall be stored in such a manner as not to be readily available for use for fishing.

(2) Subsection (1) shall not apply to a vessel which is licensed under these Regulations and is at the material time otherwise being used in conformity with the terms of that licence and the Act and these Regulations.

(3) Where any vessel is used in contravention of subsection (1), the master of the vessel is guilty of an offence.

Transshipment of catch

27. (1) The transshipment of any marine product from one vessel to another within the fishery limits is prohibited unless the vessel from which the marine product is transshipped and the vessel which receives the marine product are licensed under these Regulations as commercial fishing vessels.

(2) Where any transshipment takes place in contravention of subsection (1), the master of each of the vessels concerned is guilty of an offence, but it is a defence for a person charged with an offence under this section to prove that the marine product transshipped was not taken in the fishery limits.

PART 6**ENFORCEMENT AND MISCELLANEOUS PROVISIONS****Search warrant**

28. (1) If the Magistrate or a Justice of the Peace is satisfied by information on oath that there are reasonable grounds for suspecting that an offence against these Regulations has been, is being or is about to be committed and that evidence of the commission or intended commission of such offence is to be found at any premises or in any vehicle or vessel specified in such information, he may grant a search warrant authorising a fishery officer, together with any other persons named in the warrant, to search such premises, vehicle or vessel at any time within 1 month from the date of the warrant, using such force as may be reasonably necessary if entry to such premises or vessel is refused or cannot otherwise be obtained.

(2) Any person acting under the authority of a search warrant issued in pursuance of this section may search any person who is found on, or whom he has reasonable grounds for believing has recently left or is about to enter such premises, vehicle or vessel, as the case may be, and may seize and detain any marine products or apparatus found therein or found upon any such person and may seize and detain any vehicle or vessel which he has reasonable grounds for believing to be evidence of, or to have been used in connection with, the commission or intended commission of any offence against these Regulations, but a female shall only be searched by a female.

(3) Any person who obstructs another person in the exercise of the powers conferred by a search warrant issued in pursuance of this section is guilty of an offence.

Forfeiture

29. (1) Upon the conviction of any person for an offence under these Regulations, the court may make such order as the court thinks fit as regards the disposal of anything seized under the powers conferred by the Act or these Regulations and shall order the forfeiture of any property so seized or of any other property, which appears to the court to have been used in connection with the offence of which the accused person is convicted.

(2) Without prejudice to any other powers vested in the issuing authority, upon the conviction of a person for an offence under the Act, or these Regulations, the court may, in addition to any other penalty which it imposes for that offence, order that any licence issued under these Regulations to the person convicted shall be revoked with effect from the date of his conviction.

(3) Where a person is convicted of an offence under the Act or these Regulations within 12 months from the date of a previous conviction for such an offence, the court shall, in addition to any other penalty which it imposes for that offence, revoke any licence issued under these Regulations to the person convicted and may order that the person convicted shall be disqualified from holding or obtaining any licence issued under these Regulations for a period of not less than 1 year nor more than 5 years from the date of conviction.

Penalty for interfering with fishery protection equipment

30. Any person who damages or interferes in any way, except for just and sufficient cause, with any vessel, gear or equipment used by any fishery officer for the purpose of carrying out his duties in the enforcement of the provisions of the Act and of these Regulations, is guilty of an offence and is liable on summary conviction to a fine of \$5,000 or to imprisonment for 12 months or to both.

General penalty

31. Any person convicted of an offence for which no other penalty is provided under these Regulations is liable on summary conviction to a fine of \$5,000 or to imprisonment for 1 month or to both.

Citation

32. These Regulations may be cited as the Fisheries Protection Regulations, Revised Regulations of Anguilla F40-1.

SCHEDULE 1**FORMS****FORM 1**

(Section 5(2))

FISHERIES PROTECTION REGULATIONS**APPLICATION FORM FOR A FOREIGN FISHERMAN'S LICENCE****INSTRUCTIONS TO APPLICANT:**

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEETS AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE TO THE DIRECTOR OF FISHERIES AND MARINE RESOURCES.

I/We hereby apply for the issue to me/us of a Foreign Fisherman's Licence under section 5(1)(a)(i) of the Fisheries Protection Regulations.

1. Name and address of applicant
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members (as the case may be):
 - (a)
 - (b).....
 - (c).....
 - (d).....
 - (e).....
3. Details of vessel(s) to be used by the applicant.
 - (a) Name of vessel(s)
 - (b) Name and address of owners if not owned by applicant
 - (c) Country and port of registration
 - (d) Registration number.....
 - (e) Gross tonnage of vessel(s).....
 - (f) Overall length of vessel(s).....

- (g) Type of fishing gear used.....
- (h) Name and address of master(s) of vessel(s).....
.....
4. Details of radio equipment fitted:
- Frequencies No. of channels
..... Call sign
5. From which port will the applicant operate?
6. Type of fishing operation proposed
7. Proposed fishing area.....
8. Proposed commencement date of fishing operation.....
9. Period of licence requested.....
10. Details of any previous licence issued to the applicant under the Fisheries Protection Regulations
11. Details of fishing licences held by the applicant in any country outside Anguilla
12. Has the applicant or any shareholder, director, partner or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or of any other country? If so, please give full details.....
.....
.....

Declaration by applicant

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that, if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed Date:, 20.....

Signed Date:, 20.....

FORM 2

(Section 5(2))

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR A PROCESS OR EXPORT LICENCE

INSTRUCTIONS TO APPLICANT:

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEET AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE TO THE DIRECTOR OF FISHERIES AND MARINE RESOURCES.

I/We hereby apply for the issue to me/us of a Process or Export Licence under section 6(1)(e) of the Fisheries Protection Regulations.

1. Name and address of applicant
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members (as the case may be):
 - (a)
 - (b).....
 - (c).....
 - (d).....
 - (e).....
3. The applicant intends to engage in processing and/or exporting of marine products (delete as necessary) in or from premises at
4. (a) Species of marine products to be processed.....
- (b) Species of marine products to be exported.....
5. Source of supply for marine products to be processed/exported

6. Nature of processing operation (give full details).....
.....
.....
7. Anticipated quantities of marine product to be processed/exported
.....
.....
8. (a) Principal place of marketing of processed marine products
.....
(b) Principal destination for export of marine products
.....
9. Period of licence requested.....
10. Details of fishing licences held by the applicant in any country outside Anguilla
.....
11. Has the applicant or any shareholder, director, partner, or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or any other country? If so please give full details.
.....
.....
.....

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that, if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed Date:, 20.....

Signed Date:, 20.....

FORM 3

(Section 5(2))

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR AQUARIUM COLLECTING LICENCE

INSTRUCTIONS TO APPLICANT:

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEET AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE TO THE DIRECTOR OF FISHERIES AND MARINE RESOURCES.

I/We hereby apply for the issue to me/us of an Aquarium Collecting Licence under section 5(1)(a)(ii) of the Fisheries Protection Regulations.

1. Name and address of applicant
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members (as the case may be):
 - (a)
 - (b).....
 - (c).....
 - (d).....
 - (e).....
3. Number and species of marine products to be collected
4. Nature of collecting operation and means of storage of live catch
5. Means of export of live catch
6. Principal place or country for sale of live catch
7. Period of licence requested
8. Details of fishing licences held by the applicant in any country outside Anguilla

.....
.....

9. Has the applicant or any shareholder, director, partner or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or of any other country? If so, please give full details.

.....
.....
.....

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that, if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed Date:, 20.....

Signed Date:, 20.....

FORM 4

(Section 5(2))

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR A COMMERCIAL FISHERMAN'S LICENCE

INSTRUCTIONS TO APPLICANT:

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEET AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE TO THE DIRECTOR OF FISHERIES AND MARINE RESOURCES.

I/We hereby apply for the issue of a Commercial Fisherman's Licence under section 6(1)(a) of the Fisheries Protection Regulations.

1. Name and address of applicant
2. Name and licence number of vessel to be used
3. Name and address of owner of vessel to be used if not wholly owned by applicant
4. Nature of fishing operation (tick (✓) whichever category or categories are appropriate):
 - (a) Trolling ☐
 - (b) Trapping ☐
 - (c) Longlining ☐
 - (d) Seining ☐
 - (e) Gillnetting ☐
 - (f) Trawling ☐
 - (g) Handlining ☐
 - (h) Other ☐
5. Operation base
6. Fishing area
7. Details of fishing licences held by the applicant in any country outside Anguilla

8. Has the applicant or any shareholder, director, partner or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or of any other country? If so, please give full details.

.....
.....
.....

Declaration by applicant.

I/We, ... declare that I am/we are resident(s) of Anguilla as defined in the Fisheries Protection Regulations and that the information given in this application is true to the best of my/our knowledge and belief. I/We understand that I am/we are to report any changes in the information given in this application to the Chief Fisheries Officer within 7 days of the change and that, if any information given herein is incorrect in any material particular or if I/we cease to be a resident of Anguilla, a licence issued on the terms of this application may be cancelled.

Signed Date:, 20.....

Signed Date:, 20.....

FORM 5

(Section 5(2))

FISHERIES PROTECTION REGULATIONS

**APPLICATION FOR SPORT FISHING LICENCE/
OR SPORT FISHING VESSEL LICENCE**

INSTRUCTIONS TO APPLICANTS:

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEETS AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE, TO THE FISHERIES OFFICER, THE DEPARTMENT OF FISHERIES AND MARINE RESOURCES.

I hereby apply for the issue of a Sport Fishing Licence(s)/Sports Fishing Vessel Licence (*delete as necessary*) under section 6(1)(b) or 6(1)(d) of the Fisheries Protection Regulations.

1. Name of applicant
2. Address
(if not resident, give temporary address in Anguilla).
3. Name of vessel
4. Port of registry of vessel and registered number
.....
5. Type and make of vessel
6. Size, gross tonnage and overall length of vessel
7. Type and description of fishing gear to be used in sport fishing
.....
8. Length of stay in Anguilla (if not resident in Anguilla)
9. Period of licence requested
10. Details of any previous licence issued to the applicant under the Fisheries Protection Regulations
.....
.....
11. Details of fishing licences held by the applicant in any country outside Anguilla.....
.....

-
12. Has the applicant or shareholder, director, partner or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or of any other country. If so, please give full details

.....
.....
.....

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that, if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:, 20

Signed: Date:, 20

FORM 6

(Section 5(2))

FISHERIES PROTECTION REGULATIONS
APPLICATION FOR FISHING VESSEL LICENCE

INSTRUCTIONS TO APPLICANTS:

- (a) COMPLETE ALL ITEMS IN FULL AND IN INK. DO NOT LEAVE ANY BLANKS. IF NOT APPLICABLE, WRITE N/A.
- (b) PROVIDE FULL MAILING ADDRESS AND ADDRESS OF PLACE OF BUSINESS OR REGISTERED OFFICE, IF DIFFERENT.
- (c) SPECIFY UNITS OF MEASUREMENT IF NOT METRIC.
- (d) CONTINUE ANSWERS ON SEPARATE SHEETS AS NECESSARY AND SIGN AND DATE ALL SUCH SEPARATE SHEETS.
- (e) SUBMIT APPLICATION IN TRIPLICATE TO THE DIRECTOR OF FISHERIES AND MARINE RESOURCES.

I/We hereby apply for the issue of a Fishing Vessel Licence under section 6(1)(c) of the Fisheries Protection Regulations.

1. Name and address of applicant
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members (as the case may be):
 - (a)
 - (b).....
 - (c).....
 - (d).....
 - (e).....
3. Name of vessel
4. Name and address of owner of vessel
5. Port of registry of vessel and registered number
6. Gross tonnage of vessel
7. Overall length of vessel
8. Details of radio equipment fitted:

Frequencies No. of channels

Call sign
9. Operation base for vessel (port of country)

10. Name and address of master (if not either owner or applicant)
11. Proposed fishing area
12. Type of fishing operations
13. Details of gear fitted to vessel
14. Number of crew normally carried

(Questions 15 – 25 to be completed only where the application relates to a vessel in excess of 30' overall length and the vessel has not been previously licenced under the Fisheries Protection Regulations).

15. Normal number of crew
16. Details of crew accommodation
17. Hull material and colour
18. Year built
19. Place of construction
20. Main engine power
21. Fuel capacity
22. Daily freezing capacity
23. Storage capacity
24. Safety/life-saving equipment carried
25. Recent photograph of vessel attached
26. Details of fishing licences held by the applicant in any country outside Anguilla
27. Has the applicant or any shareholder, director, partner or member of the applicant ever been convicted of an offence under the Fisheries Laws of Anguilla or of any other country? If so, please give full details.

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that, if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:, 20.....

Signed: Date:, 20.....

FORM 7

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

FOREIGN FISHERMAN'S LICENCE

Licence No. FF/

The Licence Holder below named is hereby licensed in accordance with section 5(1)(a)(i) of the Fisheries Protection Regulations to engage in commercial fishing within that part of the fishery limits of Anguilla set out below in accordance with the terms and conditions of this Licence and subject always to compliance with the provisions of the Fisheries Protection Act and the Fisheries Protection Regulations.

Name of Licence Holder:

Address:

Period of Licence: From: To:

Area of Fishery Limits:

TERMS AND CONDITIONS APPLICABLE TO THIS LICENCE:

Dated this day of, 20.....

Signed:
Governor

FORM 8

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

PROCESS OR EXPORT LICENCE

Licence No: PE/.....

The Licence Holder named below is hereby licensed in accordance with section 6(1)(e) of the Fisheries Protection Regulations* (to use the premises described below for the purposes of processing marine products) (and) (to export marine products from Anguilla), in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Act and the Fisheries Protection Regulations.

*delete as appropriate.

Name of Licence Holder:

Licence Period: From: To:

Address of Premises:

Species of marine product authorised to be processed/and exported:

.....

Type of processing authorised to be carried out:

.....

Further conditions:

Dated this day of, 20.....

Signed:

Minister or Authorised Person

FORM 9

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

AQUARIUM COLLECTING LICENCE

Licence No. AL/.....

The Licence Holder named below is hereby licensed in accordance with section 5(1)(a)(ii) of the Fisheries Protection Regulations to take alive the species of marine product described below for use in an aquarium.

Name of Licence Holder:

Licence Period: From: To:

Species of marine product authorised to be taken:
.....

Further conditions:

Dated this day of, 20.....

Signed:
Governor

FORM 10

(Section 6(1)(a))

FISHERIES PROTECTION REGULATIONS

COMMERCIAL FISHERMAN'S LICENCE

Licence No: CF/.....

The Licence Holder named below is hereby licensed in accordance with section 6(1)(a) of the Fisheries Protection Regulations to engage in commercial fishing in the area of the fishery limits of Anguilla and to export marine products taken by him in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Act and the Fisheries Protection Regulations.

Name of Licence Holder:

Address:

Licence expires 31st July unless renewed (see below).

Area of Fishery Limits:

Special conditions:

Dated this day of, 20.....

Signed:
Minister or Authorised Person

Renewals: 1. From to 31st July Initials Date
 2. From to 31st July Initials Date
 3. From to 31st July Initials Date
 4. From to 31st July Initials Date
 5. From to 31st July Initials Date
 6. From to 31st July Initials Date
 7. From to 31st July Initials Date
 8. From to 31st July Initials Date

FORM 11

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

SPORT FISHING LICENCE

Licence No. SF/.....

The Licence Holder named below is hereby licensed in accordance with section 6(1)(b) of the Fisheries Protection Regulations to engage in Sport Fishing within that part of the fishery limits of Anguilla set out below in accordance with the terms and conditions of this licence and subject always to compliance with the provisions of the Fisheries Protection Act and the Fisheries Protection Regulations.

Name of Licence Holder:

Address:

Licence expires 31st July unless renewed (see below).

Area of Fishery Limits:

Special conditions:

Dated this day of, 20.....

Signed:
Minister or Authorised Person

Renewals: 1. From to 31st July Initials Date
 2. From to 31st July Initials Date
 3. From to 31st July Initials Date
 4. From to 31st July Initials Date
 5. From to 31st July Initials Date
 6. From to 31st July Initials Date
 7. From to 31st July Initials Date
 8. From to 31st July Initials Date

FORM 12

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

**LOCAL FISHING VESSEL LICENCE/
FOREIGN FISHING VESSEL LICENCE***

Licence No. AXA/FV/.....

The vessel named below is hereby licensed in accordance with section 6(1)(c) of the Fisheries Protection Regulations for the use for commercial fishing by the holder of a Commercial Fisherman's Licence or a Foreign Fisherman's Licence within that part of the fishery limits of Anguilla set out below in accordance with the terms and conditions of this licence and subject always to compliance with the provisions of the Fisheries Protection Act and the Fisheries Protection Regulations.

Name of vessel and port of registry:

Vessel licence number (to be displayed on vessel):

Radio call sign:

Length overall:

Area of fishery limits:

Special conditions:

Licence expires the 31st day of July unless renewed (see below).

Issued this day of, 20.....

* *Delete inapplicable words*

Signed:

Minister or Authorised Person

Renewals: 1. From to 31st July Initials Date
 2. From to 31st July Initials Date
 3. From to 31st July Initials Date
 4. From to 31st July Initials Date
 5. From to 31st July Initials Date
 6. From to 31st July Initials Date
 7. From to 31st July Initials Date
 8. From to 31st July Initials Date

FORM 13

(Section 5(3))

FISHERIES PROTECTION REGULATIONS

SPORT FISHING VESSEL LICENCE

Licence No. AXA/SV/.....

The vessel named below is hereby licensed in accordance with section 6(1)(d) of the Fisheries Protection Regulations for use for charter or hire for the purposes of sport fishing within that part of the fishery limits of Anguilla as set out below in accordance with the terms and conditions of this licence and subject always to compliance with the provisions of the Fisheries Protection Act and the Fisheries Protection Regulations.

Name of vessel:

Vessel licence number

Radio call sign:

Length overall:

Area of fishery limits:

Special conditions:

Licence expires the 31st day of July unless renewed (see below).

Issued this day of, 20.....

Signed:
Minister or Authorised Person

Renewals: 1. From to 31st July Initials Date
 2. From to 31st July Initials Date
 3. From to 31st July Initials Date
 4. From to 31st July Initials Date
 5. From to 31st July Initials Date
 6. From to 31st July Initials Date
 7. From to 31st July Initials Date
 8. From to 31st July Initials Date

FORM 14

(Section 6(2))

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR RENEWAL OF LICENCE

I/We of
hereby apply for the renewal of Licence No. for the
period, 20..... to 31st July, 20..... .

The information given in my original application for the said licence:

- (i) has not changed; *
- (ii) has not changed since the last renewal; *
- (iii) has changed, and details of such changes are given below. *

** delete as appropriate*

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/We understand that, if any information given herein is not correct in any material particular, the licence renewed on the basis of this application may be cancelled.

Signed: Dated:, 20.....

SCHEDULE 2

(Section 5(4))

LICENCE FEES

		\$
1.	Commercial Fisherman's Licence	20
2.	Sport Fishing Licence—	
	Per Day	50
	Per Month	1,000
	Per Year	5,000
3.	Fishing Vessel Licence where overall length of vessel—	
	(a) does not exceed 20 ft.	10
	(b) exceeds 20 ft. but does not exceed 30 ft.	20
	(c) exceeds 30 ft. but does not exceed 60 ft.	30
	(d) exceeds 60 ft.	100
4.	Sport Fishing Vessel Licence	500
5.	Process or Export Licence	20
6.	For issue of a replacement in any of the above categories in case of loss or destruction of original licence	10

SCHEDULE 3

(Section 11(1))

CLOSE SEASON**COLUMN 1**
Species of Marine Product**COLUMN 2**
Generally or
in Area or Areas**COLUMN 3**
Dates

[None]

[None]

[None]

SCHEDULE 4

(Section 12(1))

PROHIBITED AREAS**COLUMN 1**
Area**COLUMN 2**
Taking, Deposit etc. Prohibited

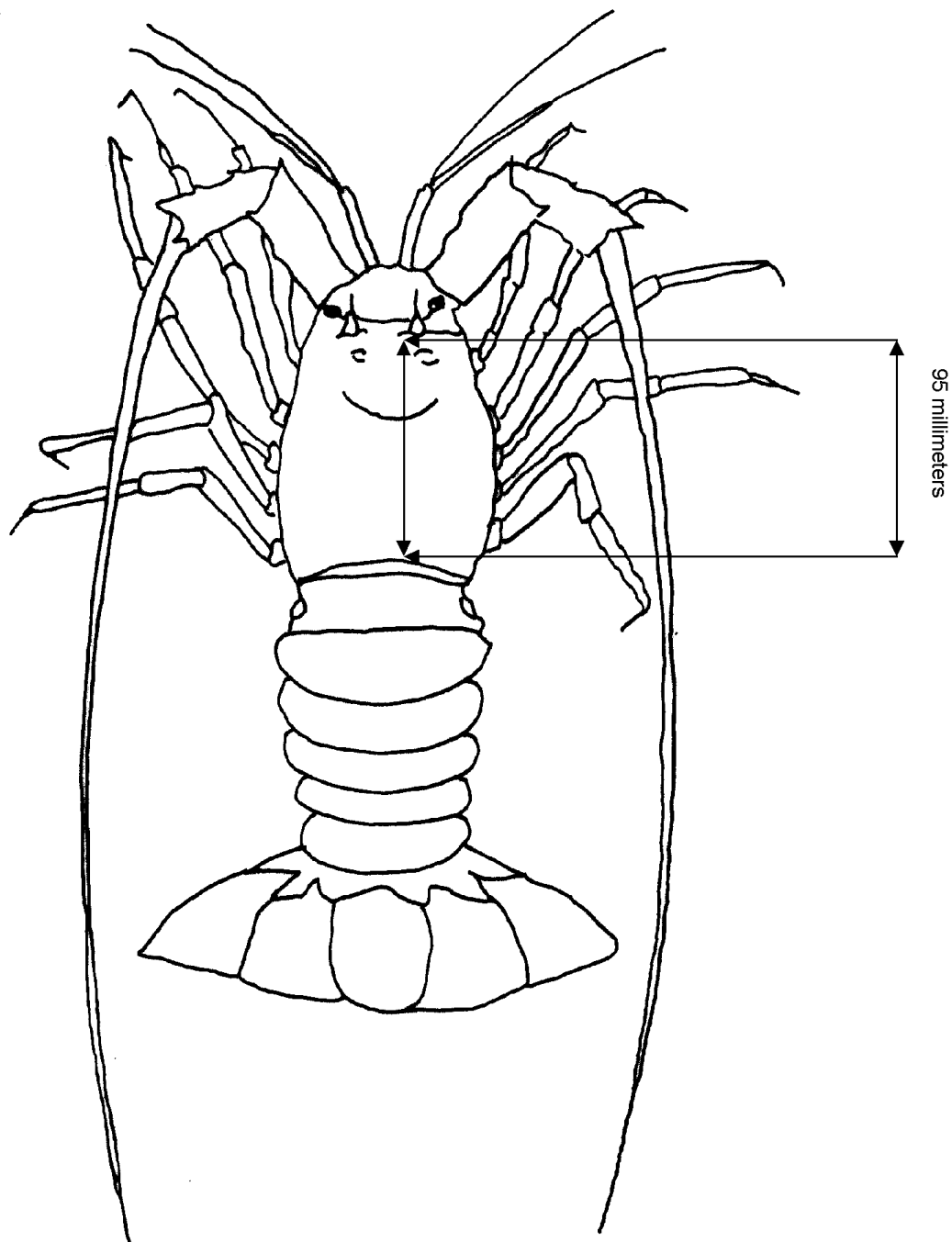
[None]

[None]

SCHEDULE 5

(Section 13(2)(a)(i))

MINIMUM LEGAL SIZE FOR LOBSTER (*PANULIRUS ARGUS*)



SCHEDULE 6

(Section 13(2)(c))

MINIMUM SIZE OF MARINE PRODUCTS**COLUMN 1**
Marine Products**COLUMN 2**
Size

[None]

[None]

SCHEDULE 7

(Section 16)

MINIMUM MESH SIZE OF NETS

[None]

SCHEDULE 8

(Section 20)

DESIGNATED FISH AGGREGATING DEVICES

[None]



ANGUILLA

REVISED STATUTES OF ANGUILLA

CHAPTER M30

MARINE PARKS ACT

Showing the Law as at 15 December 2000

Published by Authority

Printed in
The Attorney General's Chambers
ANGUILLA

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MARINE PARKS ACT**TABLE OF CONTENTS****SECTION**

1. Interpretation
2. Governor may designate marine parks by regulation
3. Map of marine park
4. Appointment and powers of Controlling Officer
5. Acquisition of land for marine parks
6. Crown not prejudiced
7. Regulations
8. Citation

MARINE PARKS ACT**Interpretation****1.** In this Act—

“Controlling Officer” means any person so appointed by the Governor under section 4;

“fish” means fish of any kind found in the sea and includes corals, crabs, lobsters, shrimps, prawns, turtles, mussels, cockles, oysters and any species of other marine fauna and includes any eggs or any part of such fish as aforesaid;

“fishing implement” means any net, line, hook, float, barrel, buoy, cage, trap, spear gun or other instrument, engine or implement used or intended to be used for the purpose of fishing;

“flora and fauna” means the plant and animal constituents, both living and non-living, of a marine park and includes shells, any part of a coral reef, or other deposit in its natural condition;

“marine areas” means the waters and the seabed thereunder within the territorial waters of Anguilla and includes any adjoining land or beach areas which form within certain areas a single ecological entity;

“marine park” means any area so designated by the Governor under section 2;

“wreck” means sunken boats, ships or derelicts, or any part of them abandoned by their owners and by the Receiver of Wreck found within the territorial waters of Anguilla.

Governor may designate marine parks by regulation

2. The Governor may by regulation designate any portion of the marine areas of Anguilla as a marine park where he considers that special steps are necessary for—

- (a) the protection of the fish, the flora and fauna and wrecks found in such areas;

- (b) preserving and enhancing the natural beauty of such area;
- (c) the promotion of the enjoyment by the public of such areas; and
- (d) the promotion of scientific study and research in respect of such areas.

Map of marine park

3. (1) There may be deposited with the Controlling Officer in Anguilla a map delineating each marine park, and such map shall be signed by the Controlling Officer.

(2) In any proceedings under this Act, a copy of a map deposited with the Controlling Officer under subsection (1) and duly certified to be a true copy thereof by the Controlling Officer shall be receivable in evidence and shall be *prima facie* evidence of the boundaries of the marine park to which it relates.

Appointment and powers of Controlling Officer

4. The Governor may appoint any person as Controlling Officer with the responsibility for the control and management of any marine park in accordance with the provisions of this Act or of any regulations made thereunder, and the Controlling Officer may be given power under any such regulations to restrict entry to a marine park and to erect fences, boundary marks, notices and direction indicators and to give directions.

Acquisition of land for marine parks

5. (1) Where the Governor considers that it is necessary to acquire any private land for the use of a marine park, he shall enter into negotiations with the owners or other persons entitled to grant rights in the land for the purpose of acquiring the land.

(2) Where it is not reasonably practicable to acquire any such land by private negotiations for any of the following reasons—

- (a) that the owner or the other person with power to grant the right are numerous or have conflicting interests;
- (b) that the owner or other person with power to grant the right, or any of them, cannot be ascertained or cannot be found;
- (c) that the owner or other person from whom the right must be obtained, or any of them, have not the necessary powers of disposition whether by reason of defect in title, legal disability or otherwise;
- (d) that the owner or other person with the power to grant the right refuses to grant it;

the Governor may by means of an order published in the *Gazette* acquire such land and upon such order being published the land specified in the order shall, subject to the provisions hereinafter contained, vest in the Crown.

(3) For the purposes of arriving at compensation for any land so acquired, the provisions of the Land Acquisition Act shall apply.

(4) The acquisition of land for any of the purposes of this Act is hereby declared to be a public purpose.

(5) In this section, “land” includes any interest in land.

Crown not prejudiced

6. Nothing in this Act shall prejudice any right of the Crown in relation to a marine park or to any marine areas or property therein.

Regulations

7. (1) The Governor may make regulations generally for the purpose of giving effect to this Act, and in particular, may provide for all or any of the following matters—

- (a) the protection of the flora and fauna and wrecks in marine parks and the establishment of offences in connection therewith;
- (b) the care, control and management of the marine parks, including the search, seizure and arrest of any person, fishing implement, vessel or carrier;
- (c) the regulation of the use and enjoyment of marine parks;
- (d) the regulation of the use of parking and refreshment facilities;
- (e) the licensing of boats and craft employed in the transportation of persons visiting marine parks, and the licensing of any guides required by such visitors;
- (f) the ensuring of public rights of way over private property to allow access to marine parks;
- (g) prohibition or restriction of—
 - (i) mooring or anchoring of vessels in a marine park,
 - (ii) scuba diving or underwater filming in a marine park or any other filming of or in a marine park, or
 - (iii) any other activity likely to result in damage to a marine park or anything therein;
- (h) the charging of fees for any of the services provided in marine parks;
- (i) the seizure and confiscation of any flora or fauna or wreck or any part thereof taken in contravention of this Act or any regulation made thereunder and of any vessel or carrier upon which the same may be found together with any fishing implement found on such vessel or carrier;
- (j) the payment of all sums for carrying this Act into effect.

(2) Any person who commits an offence against any regulation made under this Act is liable to a fine of \$5,000 or to a term of imprisonment of 6 months, and in the case of a continuing offence to a further fine of \$100 for each day on which the offence continues.

Citation

8. This Act may be cited as the Marine Parks Act, Revised Statutes of Anguilla, Chapter M30.
-



ANGUILLA

REVISED REGULATIONS OF ANGUILLA

under

MARINE PARKS ACT R.S.A. c. M30

Showing the Law as at 15 December 2000

Regulation	Citation	Page
MARINE PARKS REGULATIONS	R.R.A. M30-1	3

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Revised Regulations of Anguilla: M30-1

MARINE PARKS ACT (R.S.A. c. M30)**MARINE PARKS REGULATIONS**

Note: These Regulations are enabled under sections 2 and 7 of the Marine Parks Act, R.S.A. c. M30.

TABLE OF CONTENTS**SECTION**

1. Interpretation
 2. Marine parks designation
 3. Mooring and anchoring by permit
 4. Restriction on filming in marine parks
 5. Restriction on fishing and scuba diving in marine parks
 6. Camping, business, etc., in marine parks
 7. Restriction on introduction of flora or fauna
 8. Prohibitions on damage, etc., to flora or fauna or artifacts
 9. Offences in relation to safety, etc.
 10. Provisions as to buoys
 11. Powers and functions of the Controlling Officer
 12. Obtaining of permits
 13. Duplicate permit
 14. Revocation or suspension of permit
 15. Arrest of persons and seizure of vessels, etc.
 16. Forfeiture
 17. Offences and penalties
 18. Citation
- SCHEDULE 1: Marine Parks
- SCHEDULE 2: Forms
- SCHEDULE 3: Fees
-

Interpretation

1. In these Regulations—

“Act” means the Marine Parks Act;

“authorised person” has the same meaning as in section 4 of the Fisheries Protection Act;

“Controlling Officer” means the Controlling Officer appointed under section 4 of the Act;

“locally owned vessel” means any vessel—

- (a) wholly owned by the Government of Anguilla or any public corporation established by or under any law;
- (b) wholly owned by one or more persons belonging to Anguilla; or
- (c) wholly owned by any company, society or other association incorporated or established under the laws of Anguilla of which at least 75% of the voting rights are held by persons belonging to Anguilla;

“marine park” means any portion of the marine areas of Anguilla designated under section 2 as a marine park;

“marine product” includes any fish, aquatic animal, turtle, coral, cetacean, crustacean or mollusc and any vegetable matter living in water;

“persons belonging to Anguilla” means persons regarded as belonging to Anguilla under the Constitution of Anguilla;

“scuba” means self-contained underwater breathing apparatus;

“vessel” means any craft of any description used or capable of being used as a means of transport on, through or under water.

Marine parks designation

2. The areas designated in Schedule 1 are marine parks.

Mooring and anchoring by permit

3. (1) No vessel shall be moored or anchored in a marine park except under the authority of, and in accordance with the terms and conditions of, a permit issued for that purpose by the Controlling Officer.

(2) Notwithstanding any other provisions of these Regulations, no vessel shall be moored or anchored in a marine park between the hours of 7 p.m. and 6 a.m.

(3) Any person who moors or anchors a vessel in contravention of subsection (1) or (2) commits an offence.

Restriction on filming in marine parks

4. No person shall carry out any filming of any marine park or in a marine park or use the name of a marine park for advertising or for any other activity connected with any trade or business except under the authority of, and in accordance with the terms and conditions of, a permit issued for that purpose by the Controlling Officer.

Restriction on fishing and scuba diving in marine parks

5. (1) No person, other than a person belonging to Anguilla, shall—
- (a) fish in a marine park; or
 - (b) scuba dive in a marine park except—
 - (i) under the authority of, and in accordance with the terms and conditions of, a permit issued for that purpose by the Controlling Officer, or
 - (ii) under the supervision and control of a person licensed to operate a scuba diving business in Anguilla.
- (2) No person shall scuba dive in a marine park without displaying a “Diver Down” flag.

Camping, business, etc., in marine parks

6. No person shall camp or carry on any business or erect any structure within a marine park except under the authority of, and in accordance with the terms and conditions of, a permit issued for that purpose by the Controlling Officer.

Restriction on introduction of flora and fauna

7. No person shall introduce into a marine park any flora and fauna without the prior written permission of the Controlling Officer.

Prohibitions on damage, etc., to flora or fauna or artifacts

8. No person shall damage or remove the flora or fauna of a marine park or any artifact found or located in a marine park or do anything that is likely to result in damage to such flora or fauna or artifact.

Offences in relation to safety, etc.

9. No person when in a marine park shall—
- (a) exceed the speed limits for vessels or vehicles specified by the Controlling Officer;
 - (b) carry out any activity that is likely to endanger the health and safety of any other person;
 - (c) engage in water skiing;
 - (d) discharge any bilge or sewage or dump any form of litter or pollutant; or
 - (e) make or build any fire.

Provisions as to buoys

10. (1) No person shall, install or cause to be installed in any marine park any moorings or buoys without the prior written permission of the Controlling Officer.
- (2) The Controlling Officer may grant permission for the installation of moorings and buoys subject to such conditions as he may consider appropriate including a condition that such moorings or buoys once installed shall vest in and become the property of the Government of Anguilla.
- (3) Any person may apply to the Controlling Officer for the lease of a single-user buoy.

(4) An application for the lease of a single-user buoy under subsection (3) shall be made to the Controlling Officer and may be granted on such terms and conditions as the Controlling Officer shall deem appropriate, but the period of any one grant shall not exceed 12 months.

(5) In subsection (4), “single-user buoy” means any buoy which is reserved by the Controlling Officer for the use of any specified person for a specified period of time.

Powers and functions of the Controlling Officer

11. The Controlling Officer may—

- (a) erect or cause to be erected fences, boundary marks, notices and direction indicators in or around a marine park;
- (b) remove or destroy, or cause to be removed or destroyed, any structures unlawfully erected in a marine park, or any other thing, object or material found in a marine park that, in his opinion, may be detrimental to a marine park;
- (c) designate any area or place in a marine park—
 - (i) as a place for the mooring or anchoring of vessels, or
 - (ii) for any other specific purpose which in his opinion is reasonably required for the discharge of his powers, functions or duties under these Regulations;
- (d) specify the speed limits for vessels or vehicles authorised to use the marine park;
- (e) appoint, with the approval of the Governor, such number of officers and servants as he may consider necessary for the proper and efficient discharge and performance of his duties and functions under these Regulations; and
- (f) delegate any of his duties or functions under these Regulations to any officer or servant appointed under paragraph (e).

Obtaining of permits

12. (1) Any application for any permit under these Regulations shall be made to the Controlling Officer and shall be in Form 1 of Schedule 2 and shall be accompanied by the appropriate fee.

(2) An application for a permit in respect of any vessel, other than a locally owned vessel, shall be accompanied by a cruising permit which is valid for the relevant period of the permit to be issued under these Regulations.

(3) The Controlling Officer may, upon payment by the applicant of the appropriate fee as specified in Schedule 3, issue a permit to the applicant subject to such conditions as he may deem appropriate and in Form 2 of Schedule 2.

(4) No fees shall be levied for a permit issued for any purpose set out in section 3(1) in respect of a locally owned vessel if such vessel does not carry fare-paying passengers.

(5) A permit issued under these Regulations shall not be transferable.

(6) A permit issued for any purpose referred to in section 3(1) shall be renewable upon payment of the appropriate fee specified in Schedule 3 for a like period, but the aggregate of such renewal periods shall not exceed 1 year.

Duplicate permit

13. Where a permit is lost, damaged, destroyed, defaced or rendered illegible, the Controlling Officer may, upon application made to him and upon payment of the fee specified in Schedule 3 issue a duplicate permit.

Revocation or suspension of permit

14. (1) If it appears to the Controlling Officer that any holder of a permit issued under these Regulations has violated or failed to comply with any term or condition of any such permit, he may, without prejudice to any other action which may be taken under these Regulations against such holder of a permit, revoke or suspend such permit.

(2) Where a permit is revoked or suspended, the Controlling Officer shall as soon as possible notify the person to whom the permit has been issued of such revocation or suspension.

Arrest of persons and seizure of vessels, etc.

15. (1) Without prejudice to any other powers conferred upon them by any other law, the Controlling Officer, or any authorised person, or any customs officer or any person appointed under section 11 may—

- (a) board any vessel moored or anchored in a marine park and require to be produced for the purpose of examining or taking copies—
 - (i) any permits issued under these Regulations, or
 - (ii) any ship's log, passenger list, crew list, manifest or other official document relating to the vessel;
- (b) stop, board and search any vessel or carrier suspected to have acted or to be acting in contravention of these Regulations;
- (c) seize any vessel, carrier, fishing implement, mooring or buoy or any other thing used in contravening these Regulations;
- (d) seize any fish, flora, fauna, artifact or wreck or any part thereof taken by any person in contravention of these Regulations; or
- (e) make any inquiry which he deems necessary to determine whether any offence against these Regulations has been committed.

(2) Any vessel, carrier or other thing seized under the provisions of subsection (1) shall be taken to the nearest or most convenient port in Anguilla and the vessel, carrier or other thing seized may be detained.

(3) No action shall lie against any person referred to in subsection (1) in respect of anything done or omitted to be done by him in good faith in the exercise of his powers under these Regulations.

Forfeiture

16. (1) Upon the conviction of any person for an offence under these Regulations, the court may make such order as the court thinks fit as regards the disposal of anything seized or detained under the powers conferred by the Act or these Regulations and may order the forfeiture to the Crown of any property so seized or detained or of any other property which appears to the court to have been used in connection with the offence of which the accused person is convicted.

(2) Without prejudice to any other powers conferred by any other law, upon the conviction of a person for an offence under the Act or these Regulations, the court may, in addition to any other penalty which it

imposes for that offence, order that any permit issued under these Regulations to the person convicted shall be revoked with effect from the date of his conviction.

(3) Any marine product or other property of a perishable nature seized or detained under these Regulations may be sold at the direction of the Controlling Officer, and the proceeds of sale shall be held and dealt with in the same way as any other property seized under these Regulations.

Offences and penalties

17. Any person who—

- (a) contravenes any provision of these Regulations;
- (b) fails to comply with any term or condition of any permit issued under these Regulations;
- (c) assaults or obstructs the Controlling Officer, any authorised person, any customs officer or any person appointed under section 11 while acting in the exercise, discharge or performance of any powers, duties or functions conferred upon him by these Regulations;
- (d) refuses to answer any question lawfully put to him, or refuses or neglects to follow any direction given to him, by any person referred to in paragraph (c); or
- (e) makes any declaration or supplies any information required to be made or supplied by these Regulations knowing the same to be false in some material particular;

commits an offence and is liable on summary conviction to a fine of \$500 or to a term of imprisonment of 6 months or to both.

Citation

18. These Regulations may be cited as the Marine Parks Regulations, Revised Regulations of Anguilla M30-1.

SCHEDULE 1

(Section 2)

MARINE PARKS

All that portion of the marine area within the radius of 500 yards from Lat. 18° 15' 74" Long. 062° 58' 29" W.

SCHEDULE 2**FORMS****FORM 1**

Anguilla

(Section 12(1))

MARINE PARKS REGULATIONS

APPLICATIONAPPLICATION FOR: ☐ Carrying on a Business(please (✓) appropriate box) ☐ Filming☐ Scuba diving☐ Camping☐ Other activity (describe)

in a Marine Park.

To the Controlling Officer.

This Application must be prepared in triplicate and the original copy delivered to the applicant or his agent. To be shown to an authorised officer on request.

Name of Applicant:

Address:

Occupation:

Telephone Number:

Area of Marine Park in which activity to be carried on:

Detailed description of activity to be carried on:

Date on which permit is to commence:

Period of Permit:

Date of Application:

Fee Paid:

.....
Stamp and Signature of
Issuing Officer**NB:** This permit is not transferable.

FORM 2
 Anguilla
 (Section 12(3))
 MARINE PARKS REGULATIONS
MARINE PARK PERMIT

This permit must be prepared in triplicate and the original copy delivered to the applicant or his agent. To be shown to an authorised officer on request.

1. Name of Applicant:
2. Address and Telephone No:
3. Name of Owner:
4. Address and Telephone No:
5. Name of Captain:
6. Address and Telephone No:
7. Name of Agent:
8. Address and Telephone No:
9. Name of Vessel:
10. Vessel Registration No:
11. Place where vessel is based:
12. Port of Registry:
13. Registered Tonnage:
14. Registered Length:
15. No. of persons on board:
16. Date on which permit commences:
17. Period of validity of payment required:
18. Area for which permit required:
19. Permit for:

☐ Carrying on a Business
 (please (✓) appropriate box) ☐ Filming
☐ Scuba diving
☐ Camping
☐ Other activity (describe)

20. Detailed description of activity to be carried on:
.....
21. Conditions:
22. Date of expiration of permit:
23. Fee Paid:
24. Official receipt No:

Issued this day of, 20..... .

.....
Stamp and Signature
of Issuing Officer

This permit allows the named holder and vessel to *tie up at a mooring or anchor in a designated area at and to alight on a Marine Park.

** Delete the inapplicable words.*

NB: This permit is not transferable.

Any non-compliance with the terms and conditions of a permit may lead to the suspension or revocation of the permit.

SCHEDULE 3
(Sections 12 and 13)

FEES

Mooring or Anchoring:	Per	Day	Week	Month	3 Months
Charter Boat Local	EC\$	10	50	210	540
Charter Boat Foreign		60	210	480	1200
Foreign Owned Boat		39.75 (or US\$15)	–	–	–
Locally Operated Dive Vessel	US\$1 per person per day.				
Foreign Owned Dive Vessel	EC\$10 per person per day.				
Filming:	EC\$2,700 per day.				
Erecting Structures:	5% of the cost or value (whichever is greater) of the development for which the permit is granted.				
Camping:	EC\$28 per tent per week.				
Carrying on Business:	5% of gross income relating to the operation.				
Issue of any Duplicate Permit:	EC\$5.				



ANGUILLA

REVISED STATUTES OF ANGUILLA

CHAPTER B25

BEACH PROTECTION ACT

Showing the Law as at 15 December 2000

Published by Authority

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ANGUILLA

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BEACH PROTECTION ACT

Interpretation

1. In this Act—

“beach” includes the foreshore and the land adjoining the foreshore extending to a distance of 200 feet beyond the landward limit of the foreshore;

“order” means an order made under section 2(1);

“protected beach” means any beach declared to be a protected beach under section 2.

Declaration of protected beaches and foreshores

2. (1) The Governor may, from time to time, by order, declare any beach to be a protected beach.

(2) An order made under this section shall be subject to annulment by resolution of the House of Assembly at its next meeting following the publication of the order, and in the event that an order is annulled that order shall be of no force or effect from the date on which such motion was passed, without prejudice to anything done or suffered under such order prior to its annulment.

(3) The occupiers of any land which is affected by an order made under this section shall be served with a copy of the order within 14 days of the making of the order by posting or handing to such occupier a copy of the order.

(4) A copy of an order shall be sent to the Registrar of Lands who shall note in the encumbrances section of the Register in respect of any land affected by the order, the fact that such an order has been made and the date thereof.

(5) An order under subsection (1) is a regulation.

Removal of sand, etc., from beaches and foreshores prohibited

3. Any person who digs with the intention of taking away or, takes or carries away, or aids, or assists another in doing so, any sand, stones or gravel from any protected beach is guilty of an offence and is liable on summary conviction to a fine of \$5,000 and to imprisonment for 12 months and in the case of a continuing offence to a fine of \$500 for each day upon which such offence continues.

Payments to persons giving information

4. On conviction of any person for an offence under this Act, the Magistrate may order that a part of any fine imposed for that offence (not exceeding one half thereof) shall be paid to any person who, in the opinion of the Magistrate, has provided material information leading to that conviction.

Citation

5. This Act may be cited as the Beach Protection Act, Revised Statutes of Anguilla, Chapter B25.



ANGUILLA

REVISED REGULATIONS OF ANGUILLA

under

BEACH PROTECTION ACT R.S.A. c. B25

Showing the Law as at 15 December 2000

Regulation	Citation	Page
BEACH PROTECTION ORDERS	R.R.A. B25-1	3

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Revised Regulations of Anguilla: B25-1

BEACH PROTECTION ACT (R.S.A. c. B25)**BEACH PROTECTION ORDERS**

Note: These Regulations are enabled under section 2 of the Beach Protection Act, R.S.A. c. B25.

Protected beaches

1. The following beaches are hereby declared to be protected beaches for the purposes of the Beach Protection Act—

1. Barnes Bay Beach	10. Meads Bay Beach
2. Blowing Point Bay Beach	11. Merrywing Bay Beach
3. Captains Bay Beach	12. Rendezvous Bay Beach
4. Corito Bay Beach	13. Road Bay Beach
5. Cove Bay Beach	14. Sandy Bay Point Beach
6. Forest Bay Beach	15. Sherricks Bay Beach
7. Little Harbour Bay Beach	16. Shoal Bay West Beach
8. Lower and Upper Shoal Bay East Beach	17. Sile Bay Beach
9. Maundays Bay Beach	18. Windward Point Beach

Citation

2. These Regulations may be cited as the Beach Protection Orders, Revised Regulations of Anguilla B25-1.

**BERMUDA
1972 : 76****FISHERIES ACT 1972**

ARRANGEMENT OF SECTIONS

1	Interpretation	12	Offence outside territorial waters but within exclusive economic zone
2	Persons who are fisheries inspectors	13	Minister may make regulations
3	Marine Resources Board	14	Penalty for subsequent conviction of same offence
3A	<i>[repealed]</i>	15	Amendments <i>[omitted]</i>
4	Minister may declare protected areas within exclusive economic zone	16	<i>[repealed]</i>
5	Minister may prohibit taking of certain fish and use of certain methods of taking fish	17	Penalty for wrongful possession of article or fish
6	Licence required to import or export certain fish	18	Saving for scientific research
7	Foreign fishing vessels	19	Commencement <i>[omitted]</i>
8	Fisheries inspector may stop and search vessel; arrest	19A	Parliamentary scrutiny
9	Persons in custody		FIRST SCHEDULE
10	Detention of vessel		Forfeiture
10A	Owner of foreign vessel may enter into bond, etc.		SECOND SCHEDULE
11	Forfeiture; First Schedule		Amendments <i>[omitted]</i>
			THIRD SCHEDULE
			Fisheries Board

[12 May 1972]

*[preamble and words of enactment omitted]***Interpretation**

1 In this Act, unless the context otherwise requires, —

"charter fishing vessel" means a vessel which is available for hire or charter for the purpose of engaging in fishing on terms including the employment of the services of the operator of the vessel;

"court" means court of summary jurisdiction;

"exclusive economic zone" means the territorial waters of Bermuda together with the zone contiguous to the said waters which was proclaimed as an exclusive economic zone for Bermuda by a Proclamation made by the Governor to come into operation on the date on which the Fisheries Amendment Act 1996 comes into operation;

"fish" means fish of any kind found in the sea and includes turtles, crabs, crayfish, lobsters, shell-fish, shells, corals, seafans, and marine animals of all descriptions, whether alive or dead;

"fishing vessel" means a vessel of whatever size used by any person in fishing for reward or financial gain and includes a charter fishing vessel;

"licence" means a licence issued by the Minister;

"the Minister" means the Minister charged with responsibility for fisheries;

"protected area" means an area declared by the Minister to be a protected area under section 4;

"taking" in relation to any fish includes capturing, killing and destroying as well as attempting to capture, kill, and destroy any such fish;

"vessel" includes any ship, yacht, boat, lighter or other craft of any description used for transport by water.

[Section 1 amended by 1996:10 effective 11 June 1996]

Persons who are fisheries inspectors

2 Every officer of the Department of Agriculture, Fisheries and Parks appointed for the purpose by the Minister by instrument in writing, every commissioned officer of Her Majesty's Royal Navy, every customs officer and every police officer shall be a fisheries inspector for the purposes of this Act and shall have and may exercise the functions assigned to a fisheries inspector by or under this Act.

[section 2 amended by 1991:99 effective 1 April 1991]

Marine Resources Board

3 (1) The Minister shall by notice published in the Gazette appoint annually a body to be called the Marine Resources Board (hereinafter referred to as "the Board") which shall, subject to any general directions of the Minister, exercise the powers and discharge the functions assigned to it by this Act or any regulations made thereunder, by any other statutory provision or by the Minister.

(2) The Board shall advise the Minister on matters relating to this Act and to the protection and use of marine natural resources and of the environment in which the marine natural resources live and grow.

(3) The Statutory Instruments Act 1977 [*title 1 item 3*] shall not apply to a notice mentioned in subsection (1).

(4) The provisions of the Third Schedule shall have effect with respect to the constitution and operation of the Board and otherwise in relation thereto.

[section 3 repealed and replaced by 1991:99 effective 1 January 1992]

3A *[repealed by 1991:99]*

Minister may declare protected areas within exclusive fishing zone

4 (1) The Minister may by order declare any area of the waters within the exclusive economic zone to be a protected area for the purposes of this Act.

(2) Any order made under this section may prohibit the taking of fish within the protected area, or of such fish as may be specified in the order, either absolutely or during such periods or times as may be specified in the order, by any person otherwise than under the authority of and in accordance with the terms and conditions of a licence in that behalf granted to that person for the purpose.

(3) Any person who takes any fish in a protected area and the master or other person in charge of any vessel who suffers or permits any person on board that vessel to take any fish in a protected area in contravention of any order made under this section in respect of such area or of any term or condition attached to a licence granted under this section shall each commit an offence:

Punishment on summary conviction: subject to section 14, imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine, and any fish so taken and any vessel, instrument and equipment used in such taking shall be liable to forfeiture.

(4) Where any person is found within a protected area in possession of any fish the taking of which within that area is prohibited by an order made under this section he shall be deemed, until the contrary is proved, to have taken that fish within that area.

[Section 4 amended by 1996:10 effective 11 June 1996]

Minister may prohibit taking of certain fish and use of certain methods of taking fish

- 5 (1) The Minister may by order prohibit —
- (a) the taking, selling, purchasing or possession of any species or kind of fish specified in the order (whether by reference to size or weight or otherwise) absolutely or during such period or periods as may be so specified;
 - (b) the taking of any fish by any method specified in the order; and
 - (c) the use of any dredge, trap, device or apparatus for, or for the purpose of facilitating the taking of any fish,

anywhere within the exclusive economic zone and whether within a protected area or otherwise.

(2) Any person who takes any fish in contravention of an order made under this section, and the master or other person in charge of any vessel who suffers or permits the vessel or any person belonging to the vessel to be employed in so taking or to so take any fish, shall each commit an offence:

Punishment on summary conviction: subject to section 14, imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine, and any fish so taken and any vessel, instrument and equipment used in such taking shall be liable to forfeiture.

[Section 5 amended by 1996:10 effective 11 June 1996]

Licence required to import or export certain fish

6 (1) No person shall import or export any fish to which this section applies into or from Bermuda otherwise than under the authority of, and in accordance with the terms and conditions of, a licence in that behalf granted to that person for the purpose.

- (2) The fish to which this section applies are —
- (a) in relation to importation, any living fish, and any fish, living or dead, specified in an order made under section 5(1)(a), other than living fish of such species as the Minister may except by notice published in the Gazette;
 - (b) in relation to exportation, any fish, whether living or dead, other than fish retained as a trophy or souvenir.

(3) Any person who imports or exports any fish in contravention of this section or of any term or condition attached to a licence thereunder commits an offence:

Punishment on summary conviction: subject to section 14, imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine, and any fish so taken and any vessel, instrument and equipment used in such taking shall be liable to forfeiture.

(4) Any fish taken in the waters adjacent to Bermuda and landed in Bermuda shall not for the purposes of this section be deemed to be imported into Bermuda.

Foreign fishing vessels

7 (1) Subject to this section, where any person on board a foreign vessel takes any fish within the exclusive economic zone then that person and also the master or other person in charge of the vessel shall each commit an offence:

Punishment on summary conviction: subject to section 14, a fine of \$150,000 and the vessel used in such taking and the fish on board shall be liable to forfeiture.

(2) Notwithstanding anything to the contrary, a taking by a person on board a foreign vessel shall be deemed not to be in contravention of subsection (1) if such taking was made —

(a) for commercial or scientific research purposes under the authority of, and in accordance with the terms and conditions of, a licence in that behalf granted to the person operating the vessel; or

(b) for sporting purposes, after the vessel has first made entry in respect of the voyage on which it is engaged at a port of entry in Bermuda and may also seize the vessel's log or any other document and such log or other document may be used in evidence.

(3) In this section "foreign" in relation to a fishing vessel means not bona fide owned by a person who possesses Bermudian status within the meaning of the Bermuda Immigration and Protection Act 1956 [*title 5 item 16*].

[Section 7 amended by 1996:10 effective 11 June 1996]

Fisheries inspector may stop and search vessel; arrest

8 (1) A fisheries inspector may at any time stop, go on board and search any vessel within the exclusive economic zone, and if he has reason to suspect that any person on board such vessel has contravened any of the provisions of this Act or any regulations made thereunder he may without summons, warrant, or other process seize the vessel and detain it and any person found on board.

(2) A fisheries inspector may at any time without summons, warrant or other process seize and detain any vessel or thing which is li-

able to forfeiture under this Act or which he has reasonable grounds to believe is so liable.

(3) Any fisheries inspector and any person whom he may call to his assistance may arrest and retain without warrant any person whom such inspector has reason to suspect has committed or permitted any offence against this Act or any regulations made thereunder.

(4) Any person who resists or obstructs any fisheries inspector in the exercise of any of his powers conferred by this section commits an offence:

Punishment on summary conviction: a fine of \$300, and such person may be detained by the fisheries inspector.

(5) Where any vessel or thing is seized or detained or any person is detained under this section by a fisheries inspector, the inspector shall take such vessel, thing or person as soon as may be to the nearest or most convenient place in Bermuda and there deliver it or him into the custody of the most senior police officer there available.

[Section 8 amended by 1996:10 effective 11 June 1996]

Persons in custody

9 Where on delivering any person into the custody of a police officer in accordance with section 8—

(a) the fisheries inspector makes a complaint to such officer that such person has committed an offence against this Act or any regulations made thereunder, the police officer shall as soon as may be cause such person to be brought before a court to be dealt with according to law; or

(b) the fisheries inspector does not make any such complaint, the police officer shall forthwith release such person.

Detention of vessel

10 (1) Where any vessel other than a foreign vessel or thing is delivered into the custody of a police officer at any place by a fisheries inspector in accordance with section 8, such vessel or thing shall be detained in the custody of the Commissioner of Police to the order of the Minister at that place or at such other place as the Minister may direct until the same shall be forfeited or released in accordance with this section, as the case may be.

(1A) Where a foreign vessel is delivered into the custody of a police officer at any place by a fisheries inspector in accordance with section 8, that vessel shall be detained in the custody of the Commissioner of Police to the order of the Minister at that place or at

such other place as the Minister may direct and the provisions of section 10A shall apply.

(2) Any vessel or thing detained under subsection (1) shall be released upon demand to the owner or his duly accredited agent —

- (a) within the period of seven days next following the date of delivery of the vessel or thing to the police officer, if no proceedings are instituted within that period against the master or other person in charge of the vessel or thing in respect of an offence against this Act; or
- (b) in any case where such proceedings are instituted as aforesaid and the vessel or thing is not liable or ordered to be forfeited under this Act, upon the final determination of the proceedings and the payment of any fine or fines imposed by the court in such proceedings within the time prescribed by the court for such payment.

(3) Any vessel or thing detained under subsection (1) shall be subject to a lien in favour of Her Majesty for the amount of any fine imposed by the court upon the master or other person in charge thereof in any proceedings in respect of an offence against this Act or any regulations made thereunder, and if such fine shall not have been paid by the due date for payment thereof the Minister may, at any time thereafter, subject as in this subsection provided, after first serving upon the owner or the master or other person in charge of the vessel or thing at the time of its seizure notice in writing of his intention so to do, sell the vessel or thing by public auction and deduct the amount of the fine or fines unpaid and the expenses incurred in selling the vessel or thing from the proceeds of the sale and pay the balance to the Accountant General, to be held by the Accountant General and paid by him to such person as shall satisfy him that he is entitled thereto:

Provided that if within the period of fourteen days next following the date of service of a notice made under this subsection upon the owner, master or other person in charge of a vessel or thing, such owner, master or other person pays to the court the amount of any fine or fines unpaid, and pays to the Minister the amount of any expenses incurred by the Minister in respect of the proposed sale, the Minister shall not offer such vessel or thing for sale but shall release the vessel or thing to such owner, master or other person.

(4) No action shall lie at the suit of any person against the Accountant General in respect of the payment by him in good faith of any moneys under subsection (3) to any person appearing to him to be entitled to the same.

[Section 10 amended by 1996:10 effective 11 June 1996]

Owner of foreign vessel may enter into bond, etc.

10A (1) In the case of a foreign vessel referred to in section 10(1A), where—

- (a) within the period of seven days next following the date of delivery of the vessel to the police officer, no proceedings are instituted against the master or other person in charge of the vessel, the vessel shall be released upon demand to the owner or his duly accredited agent; or
- (b) such proceedings are instituted and the owner of the vessel, enters into a bond, with two sureties approved by the court, or gives such other security as the court considers appropriate, in treble the amount of any fine or fines which may be imposed by the court upon the final determination of such proceedings, the vessel shall be released upon demand to the owner or his duly accredited agent.

(2) The court shall, in addition to any fine which it may impose, make an order for the recovery of any costs incurred consequent on the detention of the vessel and the bond or other security shall have effect in respect of such costs.

(3) Where proceedings are instituted and the owner of the vessel fails or refuses to enter into a bond or to give other security in accordance with subsection (1), then, the provisions of section 10(3) and (4) shall have effect in respect of the foreign vessel.

[Section 10A inserted by 1996:10 effective 11 June 1996]

Forfeiture; First Schedule

11 (1) The First Schedule shall have effect for the purpose of forfeitures, and proceedings for the condemnation of any vessel or thing as being forfeited, under this Act.

(2) Subject to the First Schedule, any vessel or thing seized or detained under this Act as being liable to forfeiture shall, if condemned or deemed to have been condemned as forfeited, be disposed of in such manner the Minister may direct.

Offence outside territorial waters but within exclusive economic zone

12 Where any offence against any of the provisions of this Act or of any regulation made thereunder is committed at some place on the water within the exclusive economic zone but outside the limits of territorial waters, the place of the commission of the offence shall for the purposes of the jurisdiction of any court be deemed to be the place in Bermuda

where the offender is found or to which he is first brought after the commission of the offence.

[Section 12 amended by 1996:10 effective 11 June 1996]

Minister may make regulations

13 (1) The Minister may make regulations for the promotion, development, improvement and protection of the fisheries and fishing industry of Bermuda and, without prejudice to the generality of the foregoing words, may make regulations —

- (a) for the registration and licensing of fishing vessels and for the registration of fishermen;
- (b) for the issue of licences, their terms and conditions and for the transfer, amendment and revocation of licences;
- (c) for prohibiting or regulating the taking, sale, purchase, storing or possession of specified fish, absolutely, or during specified periods or times or for purposes other than specified purposes;
- (d) for prohibiting or regulating specified means or methods of taking fish or specified fish;
- (e) for prohibiting or regulating any act which is likely to result in the wholesale destruction of fish;
- (f) for the establishment, regulation and control of fish nurseries, aquaculture operations and preserves;
- (g) controlling or regulating the use of any tank, fish pond, enclosure, cold storage plant or apparatus for the conservation of fish which has been committed to the charge of the Minister;
- (h) providing for the regulation of the sale of any fish to the public and for the inspection, grading, packing, and storage of any fish intended for human consumption;
- (i) for the inspection of any premises, land, vessel, vehicle, fish pot or fishing net, and for the seizure and examination of any fish, fish pot, fishing net or other thing and for the forfeiture and disposal of any fish, fish pot, fishing net or other thing used or possessed in contravention of the regulations; and
- (j) generally for the better carrying out of this Act.

(2) Regulations made by the Minister under this section shall apply generally to the waters within the exclusive economic zone except where it is expressly provided that any such regulation shall apply only

in respect of any specified area of water, foreshore, coastal land, sea bed, or land under water.

(3) Regulations made by the Minister under this section may provide for the punishment of persons guilty of offences against the regulations, so, however, that no punishment shall, subject to section 14, exceed five thousand dollars or a term of imprisonment of one year or both such fine and imprisonment.

(3A) Any vessel, instrument or equipment used in contravention of this Act or any regulations made thereunder shall be liable to seizure and forfeiture.

(4) In this section "specified" means specified in the regulations.

[Section 13 amended by 1996:10 effective 11 June 1996]

Penalty for subsequent conviction of same offence

14 (1) If any person, having been convicted of an offence against any provision of this Act or of any Regulations made thereunder, is convicted of a further offence against that provision, then, notwithstanding anything to the contrary, he shall be liable upon conviction of such further offence—

(a) in the case of a person referred to in section 7, to a double fine; and

(b) in any other case—

- (i) to a double fine or double imprisonment; or
 - (ii) where a fine and a term of imprisonment may be imposed in respect of a first offence, to both such double fine and double imprisonment.
- (2) In this section—
- (a) "double fine" means a fine not exceeding double the amount; and
 - (b) "double imprisonment" means imprisonment for a term not exceeding double the term,

which might otherwise have been imposed in respect of the offence.

[Section 14 replaced by 1996:10 effective 11 June 1996]

Amendments

15 *[omitted]*

16 *[repealed by 1984:57]*

Penalty for wrongful possession of article or fish

17 Any person, whether holding a licence or not, found in possession of any article prohibited to be used, or any fish prohibited to be taken, by virtue of any licence, order or regulation issued or made under this Act and failing to give a satisfactory explanation of such possession commits an offence:

Punishment on summary conviction: subject to section 14, imprisonment for one year or a fine of \$5,000 or both such imprisonment and fine.

Saving for scientific research

18 Nothing in this Act or any regulation or order made thereunder prohibiting or restricting the taking, sale, purchase, or possession of any fish or fish of a specified description, size or weight shall apply to any person authorized by a permit issued by the Minister to take, sell, purchase or possess fish or fish of a specified description, size or weight for any of the following purposes—

- (a) for the purpose of scientific research;
- (b) for the purpose of the Bermuda Biological Station or any museum or aquarium, whether in or out of Bermuda;
- (c) for the purpose of the protection or conservation of fish

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- and bait;
- (d) for the purpose of controlling the fishing industry; or
- (e) for the establishment and control of fish nurseries and preserves;
- (f) for the purpose of aquaculture.

Commencement

19 [omitted]

[this Act was brought into operation on 22 June 1972 by SR&O 24/1972]

Parliamentary scrutiny

19A The negative resolution procedure shall apply to orders made under section 4(5), section 5(3) and regulations made under section 13.

FIRST SCHEDULE
PROVISIONS RELATING TO FORFEITURE

Notice of Seizure

1 The Minister shall give notice of the seizure of any thing as liable to forfeiture, and of the grounds therefor, to any person who to his knowledge was at the time of seizure the owner or one of the owners thereof:

Provided that notice shall not be required to be given under this paragraph if the seizure was made in the presence of —

- (a) the person whose offence or suspected offence occasioned the seizure; or
- (b) the owner or any of the owners of the thing seized or any servant or agent of his; or
- (c) the master or commander, in the case of any thing seized in any vessel.

2 Notice under paragraph 1 shall be given in writing and shall be deemed to have been duly served on the person concerned—

- (a) if delivered to him personally; or
- (b) if addressed to him and left or forwarded by post to him at his usual or last known place of abode or business or, in the case of a body corporate, at its registered or principal office; or
- (c) where he has no address within Bermuda or his address is unknown, by publication of notice of the seizure in the Gazette.

Notice of Claim

3 Any person claiming that any thing seized as liable to forfeiture is not so liable (hereafter in this Schedule referred to as a "claimant") shall, within one month of the date of the notice of seizure or, where no such notice has been served on him, within one month of the date of the seizure, give notice of his claim in writing to the Minister.

4 Any notice under paragraph 3 shall specify the name and address of the claimant, and, in the case of a claimant who is outside Bermuda, shall specify the name and address of a barrister and attorney (hereinafter referred to as "an attorney") in Bermuda who is authorized to accept service of process and to act on behalf of the claimant; and service of process upon an attorney so specified shall be deemed to be proper service upon the claimant.

Condemnation

5 If on the expiration of the relevant period aforesaid for the giving of notice of claim in respect of any thing no such notice has been given to the Minister, or if, in the case of any such notice given, any requirement of paragraph 4 is not complied with, the thing in question shall be deemed to have been duly condemned as forfeited.

6 Where notice of claim in respect of any thing is duly given in accordance with the foregoing provisions of this Schedule, the Attorney-General on behalf of the Minister shall take proceedings for the condemnation of that thing by the Supreme Court, and if the Court finds that the thing was at the time of seizure liable to forfeiture the Court shall condemn it as forfeited.

7 Where any thing is in accordance with either of paragraph 5 or 6 condemned or deemed to have been condemned as forfeited, then, without prejudice to any delivery up or sale of the thing by the Minister under paragraph 14, the forfeiture shall have effect as from the date when the liability to forfeiture arose.

Court Proceedings for Condemnation

8 Proceedings for condemnation shall be civil proceedings and shall be instituted in the Supreme Court by motion.

9 (1) In any such proceedings —

(a) the claimant or his attorney shall make oath that the thing seized was, or was to the best of his knowledge and belief, the property of the claimant at the time of the seizure; and

(b) the claimant shall give such security for the costs of the proceedings as may be determined by the Court.

(2) If any requirement of sub-paragraph (1) is not complied with the Court shall give judgment for the Attorney-General.

10 Where an appeal has been made against the decision of the Court in any proceedings for the condemnation of any thing, that thing shall, pending the final determination of the matter, be left in the custody of the Commissioner of Police.

Provision as to Proof

11 In any proceedings arising out of the seizure of any thing, the fact, form and manner of the seizure shall be taken to have been as set forth in the process without further evidence thereof, unless the contrary is proved.

12 In any proceedings, the condemnation by the Supreme Court of any thing as forfeited may be proved by the production either of the order or certificate of condemnation or of a certified copy thereof purporting to be signed by the Registrar.

Special provisions as to certain claimants

13 For the purposes of any claim to, or proceedings for the condemnation of, anything, where that thing is at the time of seizure the property of a body corporate, of two or more partners or of any number of persons exceeding five, the oath required by this Schedule to be taken and any other thing required by this Schedule or by any rules of the Supreme Court to be done by, or by any person authorized by, the claimant or owner may be taken or done by, or by any other person authorized by, the following persons respectively—

(a) where the owner is a body corporate, the secretary or some duly authorized officer of that body;

(b) where the owners are in partnership, any one of those owners;

- (c) where the owners are any number of persons exceeding five not being in partnership, any two of those persons on behalf of themselves and their co-owners.

Power to deal with seizures before condemnation, etc.

14 Where anything has been seized as liable to forfeiture the Minister may at any time if he sees fit and notwithstanding that the thing has not yet been condemned, or is not yet deemed to have been condemned, as forfeited—

- (a) to deliver it up to any claimant upon his paying to the Accountant General such sum as the Minister thinks proper, being a sum not exceeding that which in the Minister's opinion represent the value of the thing, including any duty chargeable thereon which has not been paid; or
- (b) if the thing seized is a living creature or is in the opinion of the Minister of a perishable nature, sell or destroy it or release it into the sea.

15 (1) If, where any thing is delivered up, sold, destroyed or released as aforesaid, it is held in proceedings taken under this Schedule that the thing was not liable to forfeiture at the time of its seizure, the Minister shall on demand by the claimant tender to him —

- (a) an amount equal to any sum paid by him under subparagraph (a) of paragraph 14; or
- (b) where the Minister has sold the thing, an amount equal to the proceeds of sale; or
- (c) where the Minister has destroyed or released the thing, an amount equal to the market value of the thing at the time of its seizure:

Provided that where the said amount includes any sum on account of any duty chargeable on the thing which had not been paid before its seizure the Minister, may deduct as much of that amount as represents that duty.

(2) If the claimant accepts any amount tendered to him under

sub-paragraph (1), he shall not be entitled to maintain any action on account of the seizure, detention, sale, destruction or release of the thing.

(3) For the purposes of head (c) of sub-paragraph (1), the market value of any thing at the time of its seizure shall be taken to be such amount as the Minister and the claimant may agree or, in default of agreement, as may be determined by a referee appointed by the Chief Justice, not being an official of any Government Department, whose decision shall be final and conclusive; and the procedure on any reference to a referee shall be such as may be determined by the referee.

SECOND SCHEDULE (Section 15)

[omitted]

THIRD SCHEDULE (Section 3(4))

Constitution and other provisions relating to the Board

1 The Board shall consist of not more than eleven members of whom the Director of Agriculture, Fisheries and Parks (or an officer designated by him) shall be ex officio a member and shall be executive secretary to the Board.

2 A person appointed to be a member of the Board shall hold office during the Minister's pleasure and unless his appointment is sooner terminated, shall hold office for one years [sic] from the date upon which his appointment took effect, but he shall be eligible for re-appointment upon expiration of his term of office.

3 There shall be a chairman and a deputy chairman of the Board both of whom shall be appointed by the Minister from among the members of the Board and each of whom shall, subject to paragraph 2, hold office as such during the Minister's pleasure.

4 In case of the absence or inability of any member to act, the Minister may appoint a person to act temporarily in his place.

5 Any member, other than the executive secretary, may at any time resign his office by writing addressed to the Minister and transmitted through the executive secretary and from the date of receipt by the Minister of such writing such member shall cease to be a member.

6 *[deleted effective 1 January 1992 by 1991:99]*

7 Subject to this Schedule, the Board shall be deemed to be properly constituted notwithstanding that there is a vacancy in the office of chairman or any other member.

8 (1) The Board shall meet at such times and on such days as may be necessary or expedient for the transaction of its business.

(2) The minutes of each meeting of the Board shall be kept in proper form.

(3) The chairman may at any time call a meeting of the Board and shall call a meeting within five days of a written request for that purpose addressed to him by any five members.

(4) The chairman shall preside at all meetings of the Board at which he is present, and in his absence, the deputy chairman shall preside, and in the absence of the chairman and the deputy chairman, the members present and constituting a quorum shall elect a chairman from among their members to preside at that meeting.

(5) Every member shall have one vote. The chairman shall not have an original vote but in the event of an equality of votes he shall have a casting vote only.

(6) Subject to sub-paragraph (5) the decisions of the Board shall be by majority vote.

(7) A quorum of the Board shall be five.

(8) Subject to this Schedule the Board may regulate its own proceedings.

(9) The validity of any proceedings of the Board shall not be affected by any defect in the appointment of a member.

9 Notwithstanding anything to the contrary no act done or proceeding taken under this Act by the Board shall be questioned on the ground of any omission, defect, or irregularity not affecting the merits of the case.

10 No action, suit, prosecution or other proceedings shall be brought or instituted personally against any member of the Board in respect of any act done bona fide in pursuance or execution or intended execution of this Act.

11 The office of chairman or (except in the case of the executive secretary) member of the Board shall not, by virtue of this Act alone, be a public office.

12 No decision or act of the Board or act done under the authority of the Board shall be invalid by reason of the fact that—

- (a) the full number of members for which provision is made in paragraph 1 of this Schedule was not appointed or there was a vacancy or vacancies amongst such members; or
- (b) a disqualified person acted as member of the Board at the time the decision was taken or the act was done or authorized,

if the decision was taken or the act was done or authorized by a majority vote of the persons who at the time were entitled to act as members.

13 Fees shall be paid to members (except the Director or his nominee) in accordance with the Government Authorities (Fees) Act 1971 [*title 14 item 6*].

[Third Schedule amended by 1991:99 effective 1 January 1992]

[Amended by

1975 : 34
1977 : 35
1977 : 45
1984 : 57
BR 52/1984
1991 : 99
1996: 10

BERMUDA STATUTORY INSTRUMENT

BR 8/1978

FISHERIES (PROTECTED SPECIES) ORDER 1978

*[made under section 5 of the Fisheries Act 1972 [title 25 item 8] and
brought into operation on 1 April 1978]*

ARRANGEMENT OF REGULATIONS

1	Citation and commencement	2	Protected species

Citation and commencement

1 This Order may be cited as the Fisheries (Protected Species) Order 1978 and shall come into operation on the 1st day of April, 1978.

Protected species

2 The taking of any fish of the following types anywhere within the exclusive economic zone is prohibited—

- (1) Marine turtles of all species (Reptilia, Cheloniidae and Dermochelyidae) ;
- (2) Marine mammals of all species (Whales, Dolphins and Porpoises) ;
- (3) Corals of all types, (including stony corals, sea rods and seafans) ;
- (4) Queen conch (*Strombus gigas*);
- (5) Harbour conch (*Strombus costatus*);
- (6) Bermuda cone (*Conus bermudensis*);
- (7) Netted olive (*Oliva reticularis*);
- (8) Bermuda scallop (*Pecten ziczac*);
- (9) Calico scallop (*Argopecten gibbus*);

- (10) Atlantic Pearl Oyster (*Pinctada imbricata*);
- (11) Helmets and Bonnets of all species (*Mollusca Cassididae*);
- (12) Calico clam (*Macrocallista maculata*);
- (13) West Indian top-shell (*Cittarium pica*), formerly known as *Livona pica*);
- (14) Parrotfishes of all species.

[paragraph 2 amended by by BR 44/1989 effective 24 November 1989; by BR 46/1993 effective 28 September 1993 and by 1996:10 effective 11 June 1996]

[Amended by

BR 47/1983

BR 44/1989

BR 46/1993

1996:10]

BR 38/2000
FISHERIES ACT 1972
1972 : 76
THE FISHERIES (PROTECTED AREAS) ORDER 2000

ARRANGEMENT OF REGULATIONS

- 1 Citation
- 2 Protected areas
- 3 Prohibited activities
- 4 Revocation of BR17/1990
- 5 Commencement

The Minister responsible for fisheries, in exercise of the power conferred on him by section 4 of the Fisheries Act 1972 makes the following Order:

Citation

1 This Order may be cited as the Fisheries (Protected Areas) Order 2000.

Protected areas

2 The following areas are declared to be protected areas for the purposes of section 4 of the Fisheries Act 1972:

- 1 "Cristobal Colon" located 32° 29.1'N, 64° 42.5'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Cristobal Colon";
- 2 "North East Breaker" located 32° 29.0'N, 64° 42.5'W - the area within 300 metres radius of the North East Breaker beacon;
- 3 "Taunton" located 32° 29.5'N, 64° 41.5'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Taunton";
- 4 "Aristo" located 32° 28.5'N, 64° 39.4'W - the area within a 300 metres radius of a mooring buoy at the wreck of the "Aristo";
- 5 "Mills Breaker" located 32° 24.6'N, 64° 37.8'W - the area within 300 metres radius of Mills Breaker beacon;
- 6 "Pelinaion" & "Rita Zovetto" located 32° 21.3'N, 64° 38.4'W - the area within 500 metres radius of a mooring buoy at the wrecks of the vessels "Pelinaion" and "Rita Zovetto";
- 7 "The Cathedral" located 32° 19.6'N, 64° 39.4'W - the area within 300 metres radius of the mooring buoy at the site known as the Cathedral;
- 8 "Kate" located 32° 19.4'N, 64° 41.7'W - the area within 300 metres radius of a mooring buoy at the wreck of the vessel "Kate";
- 9 "Tarpon Hole" located 32° 16.2'N, 64° 46.6'W - the area within 300 metres radius of a mooring buoy at the site known as Tarpon Hole;
- 10 "Hermes" & "Minnie Breslauer" located 32° 14.4'N, 64° 47.4'W - the area within 500 metres radius of the mooring buoy at the wrecks of the vessels "Hermes" and "Minnie Breslauer";
- 11 "Marie Celeste" located 32° 14.5'N, 64° 49.9'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Marie Celeste";
- 12 "South West Breaker Area" located 32° 13.8'N, 64° 51.8'W - the area within 600 metres radius of a mooring buoy at South West Breaker;
- 13 "North Carolina" located 32° 15.6'N, 64° 57.5'W - the area within 300 metres radius of a mooring buoy at the wreck of the "North Carolina";
- 14 "Airplane" located 32° 15.2'N, 64° 58.6'W - the area within 300 metres radius of a mooring buoy at the wreck of the airplane;
- 15 "Blanche King" located 32° 16.3'N, 64° 58.5'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Blanche King";
- 16 "Darlington" located 32° 17.2'N, 64° 59.0'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Darlington";
- 17 "L'Herminie" located 32° 19.1'N, 64° 58.5'W - the area within 300 metres radius of a mooring buoy at the wreck of the "L'Herminie";
- 18 "Vixen" located 300 metres west of Daniel's Head, Sandys - the area within a 100 metres radius of the wreck "Vixen";
- 19 "Commissioner's Point Area" being the area within a 200 metres radius of a stake located at 32° 19.72N, 64° 49.93W and bounded on the south-west and south-east by the shore;

- 20 "Lartington" located 32° 21.8'N, 64° 54.8'W - the **area** within 300 metres radius of a mooring buoy at the wreck of the "Lartington";
- 21 "Constellation **Area**" located 32° 21.8'N, 64° 54.8'W - the **area** within 500 metres radius of a mooring buoy at the wreck of the "Constellation";
- 22 "Montana" located 32° 21.7'N, 64° 54.8'W - the **area** within 300 metres radius of a mooring buoy at the wreck of the "Montana";
- 23 "Eastern Blue Cut" located 32° 23.4'N, 64° 53.1'W - the **area** within 600 metres radius of a mooring buoy at Eastern Blue Cut;
- 24 "Xing Da **Area**" located 32° 25.0'N, 64° 54.4'W - the **area** within a 200 metres radius of a mooring at the wreck of the "Xing Da";
- 25 "Snake Pit" located 32° 26.5'N, 64° 50.3'W - the **area** within 300 metres radius of a mooring buoy at the **area** called Snake Pit;
- 26 "Hog Breaker" located 32° 27.5'N, 64° 49.8'W - the **area** within 300 metres radius of a mooring buoy at Hog Breaker;
- 27 "Caraquet" located 32° 27.7'N, 64° 50.1'W - the **area** within a 300 metres radius of a mooring buoy at the wreck of the "Caraquet";
- 28 "Madiana" located at 32° 27.5'N, 64° 48.5'W - the **area** within 300 metres radius of a mooring buoy at the wreck of the "Madiana";
- 29 "North Rock" located at 32° 28.5'N 64° 46.1'W - the **area** within 1,000 metre radius of the North Rock beacon.

Prohibited activities

- 3 (1) The following activities are prohibited within a **protected area**:
 - (a) the taking of fish;
 - (b) the use within a **protected area** of any anchor other than a Danforth (sand) anchor.
- (2) Without prejudice to paragraph (1), the taking of fish is prohibited during the period beginning on 1 May and ending on 31 August in any year in any of the following **areas**:

- (a) "South Western **Area**" being the **area** enclosed: on the Northern margin by a line originating at Gibbs Hill Light, running on a bearing of 276 degrees true to the 100 fathom contour (Gibbs Hill Light in line with the tripod at the southern end of the Western Boat Channel); on the South Eastern margin by a line originating at Gibbs Hill Light and running on a bearing of 235 degrees true to the 100 fathom contour (Gibbs Hill Light in line with South West Breaker); and, on the Seaward margin by the 100 fathom contour;
- (b) "Eastern **Area**" being the **area** enclosed: on the Northwest margin by a line originating at St. David's Light and running on a bearing of 036 degrees true to the 100 fathom contour; on the Southeast margin by a line originating at St. David's Light and running on a bearing of 065 degrees true to the 100 fathom contour; and, on the Seaward margin by the 100 fathom contour; and
- (c) "North Eastern **Area**" being the **area** enclosed: On the Western margin by a line originating at the Southwest corner (SWC) located seven nautical miles due north of St. David's light at co-ordinates 32 degrees 28.5 minutes North, 64 degrees 39.0 minutes West; running due North to the 100 fathom contour; on the Southern margin by a line originating at SWC, running on a bearing of 087 degrees true to the 100 fathom contour (North Rock Beacon in line of sight with Northeast Breaker Beacon); and, on the Seaward margin by the 100 fathom contour.

Revocation of BR 17/1990

- 4 The **Fisheries (Protected Areas)** Order 1990 is revoked.

Commencement

- 5 This Order comes into force on 1st May 2000. .

Made this 12th day of April, 2000

Minister of the Environment

PROTECTED SPECIES ACT 2003



BERMUDA
2003 : 15

PROTECTED SPECIES ACT 2003

[Date of Assent: 2 December 2003]

[Operative Date: 2 December 2003]

ARRANGEMENT OF SECTIONS

1	Citation	8	Licences
2	Definitions	9	Offences
3	Administration	10	Control or destruction of protected species
4	Notice of intention to make an order under section 5 or 6	11	Powers of authorized officers
5	Protected species	12	Regulations and orders
6	Critical habitat	13	Savings
7	Recovery plans for protected species	14	Commencement

WHEREAS it is expedient to enable orders to be made for the conservation, restoration, protection and propagation of plants and animals of Bermuda that are threatened:

Be it enacted by The Queen's Most Excellent Majesty, by and with the advice and consent of the Senate and the House of Assembly of Bermuda, and by the authority of the same, as follows:—

Citation

1 This Act may be cited as the Protected Species Act 2003.

Definitions

2 In this Act —

PROTECTED SPECIES ACT 2003

"authorized officer" means a police officer, park ranger, conservation officer or other officer of the Ministry of the Environment and such other persons as may be authorized in writing by the Minister;

"critical habitat" means any land, including land covered by water, which is essential to the conservation of any protected species;

"Minister" means the Minister responsible for the environment;

"protected area" means an area designated as a protected area under section 6;

"protected species" means any species of plant or animal, declared by an order under section 5 to be a protected species;

"regulations" means regulations under section 12;

"take" in relation to any protected species of animal, includes to injure, disturb, harass, kill, capture and collect and, in relation to any protected species of plant, includes to pick, break, cut, uproot, destroy, damage and remove.

Administration

3 The Minister is responsible for the administration of this Act.

Notice of intention to make an order under section 5 or 6

4 (1) Where the Minister proposes to make an order under section 5 declaring a species to be a protected species or under section 6 designating an area to be a protected area, he shall, by publication of a notice in the Gazette, set out the details of the proposal and in the case of an order under section 6, the location and boundaries of the protected area, and the restrictions proposed to be imposed on activities within that area.

(2) The Minister shall cause a copy of the notice under subsection (1) to be deposited with the Director of Conservation Services for public inspection.

(3) The notice under subsection (1) shall invite representations from the public and, in particular, from landowners whose property may be affected.

(4) No order shall be made under section 5 or section 6 until 30 days have elapsed since the publication of the notice required by subsection (1).

(5) The Minister may dispense with the notice under subsection (1) where he considers that there is an urgent necessity to make an order under section 5 or section 6.

PROTECTED SPECIES ACT 2003

Protected species

5 (1) The Minister may make an order declaring any species of plant or animal to be a protected species.

(2) Before making an order under subsection (1) the Minister shall examine the best scientific information available and shall consider—

- (a) the distribution of the species throughout the world;
- (b) the number (with particular regard to the number of sexually mature members) and distribution of the species in Bermuda;
- (c) the location of, and threats to, the habitat of the species; and
- (d) natural or man-made factors affecting or potentially affecting the vulnerability or survival of the species, including destruction of habitat, over-exploitation, disease, predacity and use of chemicals.

(3) An order under subsection (1) shall classify the protected species as critically endangered, endangered or vulnerable in accordance with the criteria set out in the International Union for the Conservation of Nature Red List of Threatened Species, a copy of which is available for public inspection in the office of the Director of Conservation Services.

(4) The Minister shall review orders under this section and shall revoke an order when he is satisfied that the threat to the protected species has decreased to the extent that special protection is no longer needed.

Critical habitat

6 (1) Without prejudice to section 28 of the Development and Planning Act 1974, the Minister may by order designate as a protected area any critical terrestrial or marine habitat essential for the protection of a specified protected species and specify the location and boundaries of the area and the order may impose such prohibitions or restrictions on activities within the area as the Minister may consider necessary for the protection of that species.

(2) The Minister shall cause a map of each protected area to be published in the Gazette and deposited with the Director of Conservation Services for public inspection.

(3) Where a protected area is privately owned, the Minister may enter into an agreement with the owner for the protection and management of the habitat of a specified species.

(4) An agreement under subsection (3) may restrict or regulate the development or use of land within the protected area and the

PROTECTED SPECIES ACT 2003

Minister may enforce an agreement against the owner and his successors in title as a restrictive covenant.

(5) In the case of a critical marine habitat the order may impose restrictions—

- (a) prohibiting the mooring of a vessel;
- (b) prohibiting the anchoring of a vessel;
- (c) imposing speed limits on marine traffic; and
- (d) prohibiting or restricting the movement of marine traffic,

within the protected area.

(6) In the case of a critical terrestrial habitat the order may impose restrictions—

- (a) prohibiting or restricting entry to the protected area; and
- (b) with respect to activities within the protected area.

Recovery plans for protected species

7 (1) The Minister shall, in respect of a protected species, develop and publish a recovery plan which shall include—

- (a) the identification of the species and its habitat;
- (b) the identification of threats to the species;
- (c) a statement of the measures to be taken to eliminate or reduce the threats to the species; and
- (d) a description of the management action to be taken to enhance the species and its habitat to ensure the survival of the species.

(2) A recovery plan under subsection (1) shall be developed and published—

- (a) in the case of a critically endangered or endangered species, within one year; and
- (b) in the case of a vulnerable species, within three years,

of the making of the order under section 5.

Licences

8 (1) The Minister may issue a licence, on such terms and conditions as he may determine, authorizing the holder of the licence to engage in any activity that would otherwise be prohibited or restricted by this Act for the purpose of—

- (a) scientific research relevant to the conservation or survival of a particular protected species;

PROTECTED SPECIES ACT 2003

- (b) establishing or maintaining a population of protected species for exhibition to the public at a recognized institution, museum or nature reserve;
- (c) conducting an aquaculture programme or project in respect of a protected species; or
- (d) conducting a horticulture programme or a species enhancement programme for a protected species.

(2) The Minister may suspend or revoke a licence if the licensee is convicted of an offence under section 9.

Offences

9 Any person who—

- (a) except as authorized under section 8, takes, imports, exports, sells, purchases, transports or has in his possession a protected species or any part of a protected species;
- (b) contravenes a provision of this Act or any regulations or does any act in contravention of an order or any prohibitions or restrictions imposed by an order under this Act;
- (c) in a protected area wilfully destroys, damages, removes or obstructs the habitat or nest of a protected species;
- (d) fails to comply with the terms and conditions of a licence under section 8;
- (e) makes any false statement to an authorized officer or for the purpose of obtaining a licence; or
- (f) obstructs an authorized officer in the execution of his functions under this Act,

is guilty of an offence and is liable on summary conviction to a fine of \$5,000 or imprisonment for 6 months or, in the case of a second or subsequent offence, to a fine of \$10,000 or imprisonment for 6 months and, where the offence is a continuing offence, is liable on summary conviction to a fine of \$1,000 for each day on which the offence continues.

Control or destruction of protected species

10 The Minister may direct an authorized officer to control or destroy particular members of a protected species if the Minister is satisfied that —

- (a) it is necessary to do so for the protection of public health or safety;

PROTECTED SPECIES ACT 2003

- (b) it is expedient to do so for the protection of other members of a protected species; or
- (c) it is appropriate to do so in the case of an infected or injured member of the protected species.

Powers of authorized officers

11 (1) An authorized officer shall have the powers of a police officer for the purposes of enforcement of this Act.

(2) Where an authorized officer has reasonable grounds for believing that an offence has been committed against this Act he may, without a warrant—

- (a) enter and search any land, building (except one used exclusively as a dwelling house), tent or structure of any kind in which he has reason to believe that evidence of the commission of such offence is to be found;
- (b) in any place stop, detain, and search any vehicle or vessel which appears to have been used or is being used in the commission of an offence against this Act;
- (c) seize any vehicle, vessel, weapon, or thing in connection with which an offence appears to have been committed against this Act or any plant, animal or marine species or any thing whatsoever which he has reason to believe is being possessed in contravention of this Act;
- (d) stop, detain, search and arrest any person whom he reasonably suspects of having committed an offence against this Act.

(3) Any thing seized under subsection (2) shall, subject to any order of the court, be forfeited to the Crown.

Regulations and orders

12 (1) The Minister may make regulations for administering this Act and for giving effect to its objects and intentions and, in particular, for ensuring the proper use, management and administration of protected areas and for the survival and conservation of protected species.

(2) Regulations under subsection (1) and orders under sections 5 and 6 are subject to the negative resolution procedure.

Savings

13 Nothing in this Act shall derogate from the Agriculture Act 1930, the Fisheries Act 1972, the Care and Protection of Animals Act 1975, the Protection of Birds Act 1975, the Marine Board Act 1962 or the Bermuda National Parks Act 1986.

PROTECTED SPECIES ACT 2003

Commencement

14 This Act comes into operation on such date as the Minister may appoint by notice published in the Gazette.

PROTECTED SPECIES ACT 2003

CHAPTER 87

TURTLES ORDINANCE

(Amendment of 1986)

1. This Ordinance may be cited as the Turtles Ordinance
2. In this Ordinance the word “turtle” means sea or river turtle.
3. Any person who –
 - (a) catches or takes, or attempts to catch or take, or causes to be caught or taken any turtle between such dates as the Governor in Council may, by notice publish in the Gazette appoint; or
 - (b) notwithstanding the provisions of paragraph (a), at any time catches or takes, or attempts to catch or take, or causes to be caught or taken, any turtle which is under twenty pounds in weight; or
 - (c) slaughters any turtle or buys, sells, exposes for sale or has in his possession the whole or any portion of the meat of such a turtle, between such dates as the Governor in Council may, by notice publish in the Gazette appoint; or
 - (d) notwithstanding paragraph (a) takes, captures or disturbs or attempts to take, capture or disturb any turtle or turtle eggs found on the shores of the territory or within one hundred yards thereof; or
 - (e) buys, sells, offers or exposes for sale or has in his possession any turtle eggs,

shall be guilty of an offence against this Ordinance, and, on summary conviction, shall be liable to a fine not exceeding one thousand dollars.

4. If any police officer shall have reasonable grounds for believing that any person is committing or attempting to commit an offence against this Ordinance he may arrest such person without warrant.
5. Any police officer may seize any turtle or part thereof or any turtle eggs (including the eggs of trunk turtles) found in the possession of any person between such dates as the Governor in Council may, by notice publish in the Gazette appoint and upon the conviction of such person the articles so seized shall be forfeited.
6. Any net, instrument or thing which any police officer has reasonable grounds for believing is being or has been used for or in connection with the commission of any offence against this Ordinance shall be seized by such police officer, and any magistrate may, upon conviction of any person for such an offence against this ordinance in connection with which such net, instrument or things so seized was used, order such net, instrument of thing to be forfeited.
7. Upon any conviction under this Ordinance the magistrate may order that a part of any fine imposed not exceeding a moiety be paid to any person whose information led to such a conviction.

CHAPTER 87

TURTLES ORDINANCE

THE TURTLES (PROTECTION) NOTICE MADE UNDER SECTION 3 OF THE TURTLES ORDINANCE (Amendment of 1987)

1. This notice may be cited as the Turtles (Protection) Notice
2. In this Notice the word “turtle” means sea or river turtle.
3. The period between 1st April and the 30th November, inclusive of both days, is appointed as the period during which it is unlawful for any person within the meaning of section 3 of the Ordinance-
 - (a) to catch or take or attempt to catch or take, or cause to be caught or taken any turtle;
 - (b) to slaughter any turtle or buy, sell, offer or expose for sale or have in his possession the whole or any portion of the meat of any such turtle.

Supplement No. 2 published with Gazette No. 9 of 1st May, 1995.

THE MARINE CONSERVATION LAW, 1978 (LAW 19 OF 1978)

(1995 Revision)

Consolidated with Laws 5 of 1985 and 5 of 1993 and the Interpretation Order, 1983.

Revised under the Law Revision Law (19 of 1975).

Originally enacted-
Law 19 of 1978-8th September, 1978
Law 5 of 1985-25th March, 1985
Law 5 of 1993-21st July, 1993

Originally made-
Interpretation Order, 1983-10th May, 1983

Consolidated and revised this 28th day of March, 1995.

MARINE CONSERVATION LAW (1995 Revision)

ARRANGEMENT OF SECTIONS

Part I-Preliminary

1. Short title
2. Definitions

Part II-Administrative

3. Marine Conservation Board
4. Functions of the Board
5. Fisheries officers

Part III-Protection of Certain Species

6. Absolute protection of certain lobsters
7. Closed season for lobsters
8. Limit of lobster catch
9. Restriction on taking and receiving conch

Part IV-Restricted Marine Areas and Marine Parks

10. Restricted marine areas
11. Marine Parks

PART V-Restriction of Fishing Methods

12. Use of noxious substances prohibited
13. Fishing by divers prohibited
14. Use of spear guns prohibited
15. Use of seine or gill nets prohibited
16. Restriction on taking certain marine life

Part VI-General

17. Restriction on certain exports
18. Control of effluents
19. Protection of submerged features
20. Constable's power of arrest
21. Forfeiture
22. Application

- 23. Appeals against decisions of the Board
- 24. Regulations
- 25. Offences and penalties

MARINE CONSERVATION LAW

(1995 Revision)

Part I-Preliminary

1. This Law may be cited as the Marine Conservation Law (1995 Revision). Short title
2. In this Law, unless the context otherwise requires- Definitions
 - “Board” means the Marine Conservation Board established by section 3;
 - “cape length” with reference to crustaceans means the measurement from between the horns to the trailing edge of the carapace;
 - “Cayman waters” means the territorial waters of the Islands and includes the inland waters thereof;
 - “Chairman” means the Chairman of the Board and any person acting under his direction as such;
 - “coral” includes all species of marine coral known as such whether alive or dead;
 - “day” means a period of twenty-four hours terminating at midnight;
 - “fisheries officer” means a person appointed as such under section 5;
 - “game warden” means a person appointed as such under the Animals Law, 1976; Law 8 of 1976
 - “Governor” means the Governor in Council;
 - “marine life” includes creatures and plants which exist mainly in water as well as coral, sponge and every class of crustacean and shellfish;
 - “marine park” means an area designated as such under section 11;
 - “master” in relation to a vessel means the person or persons having control thereof at any given time;
 - “noxious substance” includes explosives and any substance by means of which any marine life may be killed, stupefied or otherwise harmed but does not include any device for catching fish used lawfully under this Law;

“restricted marine area” means an area designated as such under section 10;

“sell” includes disposal of as well as to offer for sale or disposal and any attempt so to do;

“tail length” with reference to crustaceans means the measurement from the leading edge of the first abdominal segment to the extremity of the extended tail fan;

“take”, “catch” and their cognates mean to take, kill or capture any marine life from its natural habitat and includes any attempt so to do; and

“vessel” includes ship, boat, raft, barge, float, lighter and hovercraft.

Part II-Administrative

Marine Conservation
Board

3. (1) There is hereby established a Board called the Marine Conservation Board consisting of a Chairman and eight other members to be appointed by the Governor to hold office at the pleasure of the Governor. Three of the members so appointed shall be residents of Cayman Brac or Little Cayman.

(2) The Governor may appoint a secretary and other officers to assist the Board with its duties who may or may not hold other offices in the civil service.

(3) The expenses of the Board shall be defrayed from funds voted for that purpose by the Legislative Assembly.

(4) Meetings of the Board shall be convened by the Chairman on at least two occasions in each year and on other occasions at the discretion of the Chairman.

(5) The Board shall reach its decisions by a majority vote of its members:

Provided that the Chairman shall not have an original vote but in the event of a tie shall have a casting vote.

(6) Four members present within a quarter of an hour of the time fixed for a Board meeting shall constitute a quorum.

(7) In the absence of the Chairman at any meeting those present and forming a quorum shall elect a Chairman from among their number.

(8) The decisions of the Board shall be put into effect by directives issued under the hand of the Chairman and decisions generally affecting the public shall be gazetted.

(9) In all other respects the Board shall have control of its own procedure.

4. The functions of the Board are-

Functions of the Board

- (a) the general administration of this Law;
- (b) the control of fisheries officers;
- (c) the issue of licences under this Law; and
- (d) the collection of fees payable under this Law and the accounting therefor to the Treasury.

5. (1) The Board may appoint suitable persons to be fisheries officers and entrust them with such powers as may be considered necessary to enable them to assist in the enforcement of this Law and such fisheries officers shall hold office at the Board's pleasure and be *ex officio* members of the staff of the Board.

Fisheries officers

(2) All constables and game wardens are *ex officio* fisheries officers.

(3) Fisheries officers, subject to the directions of the Board, have, for the purpose of performing their duties under this Law, all the rights and immunities of constables acting generally in the ordinary course of their duty.

(4) Any fisheries officer may, in any public place, Crown lands, restricted marine area or marine park or in any animal sanctuary established under the Animals Law, 1976, search any person whom he may have reasonable cause to suspect of having contravened this Law or any regulations and may stop and search any vehicle, boat or other conveyance in or upon which he has reasonable cause to suspect that there is any marine life in respect of which any offence against this Law or any regulations has been committed or in or upon which he has reasonable cause to suspect that there is any noxious substance, spear gun, trap, net or other instrument used in the commission of any such offence.

Law 8 of 1976

Part III-Protection of Certain Species

6. Any person who, in Cayman waters, takes, injures or has in his possession-

Absolute protection of certain lobsters

- (a) any spiny lobster (*Panulirus argus*) below 3 1/2 inches carapace length or 6 inches tail length; or

	(b) any member of any species of lobster other than the spiny lobster aforesaid, is guilty of an offence.
Closed season for lobsters	7. Any person who takes from Cayman waters or receives or has in his possession any lobsters at all taken from Cayman waters during the months of February to July inclusive is guilty of an offence.
Limit of lobster catch	8. (1) Any person who takes from Cayman waters in any one day more than five spiny lobsters (<i>Panulirus argus</i>) of or exceeding 3 1/2 inches cape length or 6 inches tail length is guilty of an offence. (2) Any person who permits or causes to be caught from or loaded onto any one vessel in any one day- (a) more than five lobsters of the kind referred to in subsection (1) for each person on board such vessel; or (b) fifteen such lobsters, whichever be the lesser number, is guilty of an offence.
Restriction on taking and receiving conch	9. (1) Any person who takes from Cayman waters in any one day more than fifteen conch is guilty of an offence: Provided, however, that the Board may by notice in the Gazette suspend the operation of this sub-section from time to time in such area or areas as it may specify in such notice. (2) Any person who causes or permits to be loaded onto any vessel in Cayman waters more than twenty conch in any one day is guilty of an offence. (3) Any person who, in any one day, purchases or receives more than twenty conch taken from Cayman waters is guilty of an offence.

Part IV-Restricted Marine Areas and Marine Parks

Restricted marine areas	10. (1) The Governor may designate areas of Cayman waters to be restricted marine areas under the management of the Board for the purpose of marine research and development, and such areas shall be clearly demarcated and shall be closed to all members of the public save licensees of the Board.

(2) Any person who, not being licensed in that behalf, enters upon a restricted marine area is guilty of an offence.

11. (1) The Governor may designate certain areas of Cayman waters to be marine parks and such areas shall be clearly demarcated and subject to such restrictions of user by the public as the Governor may prescribe in each case. Marine parks

(2) Any person who, in a marine park, fails to comply with any restriction imposed with respect thereof is guilty of an offence.

Part V-Restriction on Fishing Methods

12. Any person who uses any noxious substance for the purpose of taking marine life in Cayman waters is guilty of an offence. Use of noxious substances prohibited

13. Subject to section 16, any person who, while equipped with any kind of underwater breathing apparatus, takes any marine life in Cayman waters is guilty of an offence. Fishing by divers prohibited

14. Any person who has a speargun in his possession in the Islands or takes any marine life with the aid of a spear gun in Cayman waters is guilty of an offence unless licensed by the Board who may, in granting such licence, make such conditions as to possession and use as it may think fit. Use of spear guns prohibited

15. Any person who uses or attempts to use any seine or gill net for the purpose of taking marine life in Cayman waters is guilty of an offence: Use of seine or gill nets prohibited

Provided that the Board may, in exceptional circumstances, grant licences for the use of seine nets and in granting such licences may make such conditions as to possession and use as it may think fit.

16. Any person who, not being licensed in that behalf by the Board, takes any- Restriction on taking certain marine life

- (a) coral;
- (b) algae;
- (c) sponge;
- (d) turtle egg; or
- (e) hermit crab (save in reasonable quantities for fish bait or human consumption),

is guilty of an offence.

PART VI-General

Marine Conservation Law (1995 Revision)

Restriction on certain exports	17. Any person who, not being licensed in that behalf by the Board, exports or attempts to export any live fish or other free moving marine creature or hermit crab is guilty of an offence.
Control of effluents Law 6 of 1981	18. Any person who directly or indirectly causes or permits to flow or to be put into Cayman waters any harmful effluents or raw sewage, unless specifically permitted in that behalf under the Public Health Law, 1981 or any other law, is guilty of an offence.
Protection of submerged features	19. Any person who, unless licensed in that behalf, in connection with any buildings, dredging or construction work or licensed by the Governor for any purpose or being permitted or required so to do by any other law, intentionally cuts, carves, injures, mutilates, removes, displaces or breaks any underwater coral or plant growth or formation in Cayman waters is guilty of an offence.
Constable's power of arrest	20. A constable may arrest any person whom upon reasonable grounds he suspects of being in contravention of this Law or any regulations controlling the taking of marine life and may stop and search any vessel or vehicle which he reasonably suspects is being used in effecting the purpose of such contravention.
Forfeiture	21. Where any person is convicted of an offence under this Law or any regulations relating to the taking of marine life, the court, on conviction, may order the forfeiture of any trap, net, diving equipment or other paraphernalia used or intended to be used in the commission of the offence and may order the forfeiture of any vessel or vehicle so used: Provided that in the case of forfeiture of a vessel or vehicle the owners thereof may be permitted to recover the same on payment of six thousand dollars or such lesser sum and upon such other terms as the court may order.
Application	22. (1) This Law shall not apply to the Crown. (2) This Law shall not apply to such scientific bodies or persons as the Board may from time to time specifically exempt in writing upon such conditions as the Board may prescribe in each case.
Appeals against decisions of the Board	23. (1) Any person aggrieved by any decision of the Board may, within ten days of the receipt of notification of that decision, appeal against it to the Governor whose decision shall be final and binding on the appellant. (2) A decision of the Governor under subsection (1) shall be deemed to be an administrative and not a judicial decision. No person shall be required to give any reason for such decision nor shall it be questioned in any court of law.

24. The Governor may make Regulations-

Regulations

- (a) prescribing the powers of fisheries officers;
- (b) prescribing marine parks;
- (c) prescribing restricted marine areas and conditions applicable to each such area;
- (d) varying the limits and numbers of marine creatures which may, from time to time, be taken or exported;
- (e) prescribing insignia and badges which may be displayed or worn exclusively by fisheries officers;
- (f) for the protection of marine life from damage by anchor and similar contrivances;
- (g) prescribing forms to be used in the application for and granting of licences;
- (h) prescribing fees to be charged by the Board for receiving applications and granting licences;
- (i) controlling the taking of black coral (*Antipathes sp*);
- (j) prescribing forms of seines and nets which may and may not be used in Cayman waters;
- (k) for the stocking of restricted marine areas and marine parks with marine life and the protection of such stock;
- (l) prescribing minimum sizes below which marine creatures may not be taken;
- (m) prescribing closed seasons within which marine creature may not be taken;
- (n) prescribing areas within which marine creatures may not be taken;
- (o) prescribing areas within which fishing by certain methods only is permissible;
- (p) prescribing limits to the number of fish traps, seines or other nets which may be used by any person within any prescribed area; and
- (q) prescribing anything required by this Law to be prescribed.

25. Whoever contravenes this Law or any regulations made hereunder is guilty of an offence and liable on summary conviction to a fine of five hundred thousand dollars and to imprisonment for twelve months and in addition thereto the court so convicting may order the confiscation of any vessel or equipment that it is satisfied has been used for the purpose of committing or facilitating the commission of such offence or was intended to be used for such purpose.

Offences and penalties

Publication in consolidated and revised form authorised by the Governor in Council this 28th day of March, 1995.

Mona N. Banks-Jackson
Clerk of Executive Council

Supplement No. 4 published with Gazette No. 15 of 22nd July, 1996.

THE MARINE CONSERVATION LAW

(1995 Revision)

**THE MARINE CONSERVATION (TURTLE PROTECTION)
REGULATIONS**

(1996 Revision)

Revised under the authority of the Law Revision Law (19 of 1975).

The Marine Conservation (Turtle Protection) Regulations, 1978 made the 19th September, 1978.

Consolidated with the -

Marine Conservation (Turtle Protection) (Amendment) Regulations, 1985 made the 12th April, 1985.

Consolidated and revised this 11th day of June, 1996.

MARINE CONSERVATION (TURTLE PROTECTION) REGULATIONS

(1996 Revision)

ARRANGEMENT OF REGULATIONS

1. Citation
2. Definition
3. Prohibition on possession of turtle eggs
4. Closed season for turtles
5. Illegal possession of turtles
6. Licensing of traditional fishing
7. Tagging by licensees
8. Inspection of turtles
9. Failure to return tag
10. Penalties

MARINE CONSERVATION (TURTLE PROTECTION) REGULATIONS

(1996 Revision)

Citation	1. These Regulations may be cited as the Marine Conservation (Turtle Protection) Regulations (1996 Revision).
Definition	2. In these Regulations- “turtle” means any member of any of the marine species of the Phylum Chordata, Class Reptilia, Order Chelonia, including, but without in any way limiting the generality of the foregoing- Chelonia mydas, the green turtle; Eretmochelys imbricata, the hawksbill turtle; Caretta caretta, the logger head turtle; Dermochelys coriacea, the trunkback turtle; Chelonia depressa, the Australian sea turtle; Lepidochelys olivacea, the Ridley turtle; and hybrids between these various species.
Prohibition on possession of turtle eggs	3. Whoever has in his possession any turtle egg is guilty of an offence: Provided, however, that nothing in this regulation shall apply to- (a) the egg of any turtle bred in captivity by the holder of a licence granted under the Endangered Species Protection and Propagation Law, 1978; or
Law 21 of 1978	

- (b) any egg taken in accordance with a licence issued by the Board under section 16 of the Law.

4. Whoever takes, disturbs or molests in any way or attempts to take, disturb or molest in any way any turtle during the months May to October in any year is guilty of an offence: Closed season for turtles

Provided that this regulation shall not apply to a turtle bred in captivity by the holder of a licence in respect of turtles under the Endangered Species Protection and Propagation Law, 1978.

5. Whoever, not being licensed by the Board under regulation 6, in respect of turtles, or the Endangered Species Protection and Propagation Law, 1978, has a turtle in his possession is guilty of an offence. Illegal possession of turtles

6. (1) The Board may grant licences to fishermen who have traditionally taken turtles within the Cayman Fisheries Zone by traditional methods to take turtles within such Zone by such traditional methods for consumption within the Islands. Licensing of traditional fishing

(2) Licences under subregulation (1) shall be issued only to persons normally resident in the Islands and each such licence shall-

- (a) be issued annually and specify the maximum number of turtles which may be taken within such year;
- (b) prohibit the taking of turtles by means of harpoon or spear gun; and
- (c) specify the minimum size of turtles which may be taken.

7. Every turtle taken by the holder of a licence shall, immediately after taking, have attached to it one of the tags which shall be issued to such holder by the Board, and whoever, whether licensed or not, has in his possession a turtle untagged in contravention of this regulation is guilty of an offence. Tagging by licensees

8. Any licence holder or other person who slaughters or injures a turtle before such turtle has been inspected by a fisheries officer and before such fisheries officer has checked and recorded the details of the licence under which such turtle has been taken, the weight and sex of such turtle, the area and date of capture of such turtle and the number of the tag upon such turtle is guilty of an offence. Inspection of turtles

9. Any licence holder who having lawfully slaughtered or otherwise disposed of a turtle fails forthwith to return a tag to a fisheries officer is guilty of an offence. Failure to return tag

Marine Conservation (Turtle Protection) Regulations (1996 Revision)

Penalties 10. Whoever is guilty of an offence under these Regulations is liable on conviction to a fine of five thousand dollars and to imprisonment for twelve months.

Publication in consolidated and revised form authorised by the Governor in Council this 11th day of June, 1996.

Clerk of Executive Council

Supplement No. 3 printed with Gazette No. 15 of 22nd July, 1996.

THE MARINE CONSERVATION LAW

(1995 Revision)

THE MARINE CONSERVATION (MARINE PARKS) REGULATIONS

(1996 Revision)

Revised under the authority of the Law Revision Law (19 of 1975).

The Marine Conservation (Marine Parks) Regulations, 1986 made the 18th February, 1986.

Consolidated with the -

Marine Conservation (Marine Parks) (Amendment) Regulations, 1986 made the 29th April, 1986.

Marine Conservation (Marine Parks) (Amendment) Regulations, 1988 made the 31st May, 1988.

Marine Conservation (Marine Parks) (Amendment) Regulations, 1994 made the 23rd August, 1994.

Consolidated and revised this 11th day of June, 1996.

MARINE CONSERVATION (MARINE PARKS) REGULATIONS

(1996 Revision)

ARRANGEMENT OF REGULATIONS

1. Citation
 2. Definitions
 3. Categories of marine parks
 4. Replenishment zones
 5. Marine park zones
 6. Environmental zones
 7. Emergency anchoring
 8. Designation of zones
 9. Commission of offences
- First Schedule: Replenishment zones
Second Schedule: Marine Park zones
Third Schedule: Environmental zones
Fourth Schedule: Illustrative plans

MARINE CONSERVATION (MARINE PARKS) REGULATIONS

(1996 Revision)

1. These Regulations may be cited as the Marine Conservation (Marine Parks) Regulations (1996 Revision). Citation
2. In these Regulations- Definitions
 - “cast net” means any net cast by hand by one individual;
 - “drop-off” means the first part of the sea floor to attain not less than eighty feet in depth on a line proceeding from and at right angles to the shore;
 - “fry” means any small silver fish under three inches in length of the herring (clupeidae) or anchovy (engraulidae) families;
 - “fry net” means any net or device designed for catching fry;
 - “spear gun” means any device whereby a harpoon, rod, spear or other projectile may be impelled through water; and
 - “sprat” means any small silver fish under six inches in length of the herring (clupeidae) or anchovy (engraulidae) families.
3. For the purposes of determining what restrictions shall apply to areas designated as marine parks, there shall be three categories of marine parks, namely- Categories of marine parks
 - (a) replenishment zones;
 - (b) marine park zones; and
 - (c) environmental zones.
4. The following are prohibited in replenishment zones- Replenishment zones
 - (a) the taking of conch and lobster;
 - (b) the use of spear guns, pole spears, fish traps and fish nets of all kinds, except that fry and sprat may be taken with fry or cast nets.
5. (1) Subject to subregulations (2) and (3), the following are prohibited in marine park zones- Marine park zones
 - (a) the taking of any form of marine life by any means; and
 - (b) the anchoring of boats.

(2) Notwithstanding subregulation (1), the taking of fish is permitted in the following circumstances-

- (a) by line, at or beyond the drop-off;
- (b) by line from the shore, without the use of a boat; and
- (c) by use of fry or cast nets, where the fish taken are fry or sprat.

(3) Notwithstanding subregulation (1), anchoring is permitted in the following circumstances-

- 1995 Revision
- (a) by boats not exceeding sixty feet in length provided that they do not use grappling hooks, anchor only in sand and their anchor chain or rope does not lie upon coral;
 - (b) by all boats in port anchorage areas designated as such by the Port Regulations (1995 Revision).

(4) The entry, mooring, anchoring, and the discharge of passengers, without the approval of the Board, into or in the area at Bloody Bay-Jackson Point at Little Cayman designated as a marine park zone (being numbered 2H in the Second Schedule) by a commercial vessel, as defined in regulation 2 of the Marine Conservation Regulations (1996 Revision), is prohibited. Such approval may be granted subject to whatever conditions the Board considers appropriate.

Environmental zones 6. The following are prohibited in environmental zones-

- (a) the taking of any form of marine life by any means;
- (b) the use of any anchor;
- (c) entry by any person into the water; and
- (d) exceeding a speed of five knots.

Emergency anchoring 7. No prohibition on anchoring imposed by these regulations shall apply during a declared state of emergency, during the currency of a hurricane warning or when permission is given by the Port Director to a specific vessel in circumstances which, in the opinion of the Port Director, constitute an emergency.

Designation of zones 8. (1) The areas described in the First Schedule are designated as replenishment zones.

(2) The areas described in the Second Schedule are designated as marine park zones.

(3) The areas described in the Third Schedule are designated as environmental zones.

(4) The above areas are shown on the plan in the Fourth Schedule. That plan is for illustrative purposes only, and in the event of any discrepancy between the plan and the written descriptions contained in the First, Second or Third Schedules, the description in the relevant Schedule shall prevail.

9. In the case of the contravention of any of these regulations in circumstances which involve the use of a boat, all the persons in the boat at the time of the contravention shall be deemed to be responsible therefor, and shall be liable for the contravention as principal offenders. Commission of offences

FIRST SCHEDULE

Grand Cayman-Replenishment Zones

1A Head of Barkers-Flats

Starting on the coast the north east corner of Block No. 16A Parcel No. 21, approximate longitude 81°21'41" west, approximate latitude 19°22'51" north, thence in a north easterly direction for a distance of approximately 3,200 feet to reach the western boundary of Vidal Cay Block No.16A Parcel No. 26 approximate longitude 81°21'14" west, approximate latitude 19°23'06" north.

Thence in a northerly direction for a distance of approximately 3,600 feet to reach the outer edge of the reef at approximate longitude 81°21'43" west, approximate latitude 19°23'43" north, thence in a north westerly direction along the outer edge of the reef for a distance of approximately 14,000 feet to reach approximate longitude 81°23'19" west, approximate latitude 19°24'00" north, thence southerly for a distance of approximately 1,200 feet to reach the coast at Conch Point Block No. 8A Parcel No. 7 approximate longitude 81°23'19" west, approximate latitude 19°23'48" north.

Thence in a south easterly direction along the coast to reach the starting point.

1B West Bay Cemetery - Victoria House

Starting on the coast at the north west corner of the cemetery Block No. 5C Parcel No. 124 approximate longitude 81°23'49" west, approximate latitude 19°21'56" north, thence in a south westerly direction for a distance of approximately 2,500 feet to the drop-off approximate longitude 81°24'09" west, approximate latitude 19°21'43" north.

Thence in a southerly direction along the drop-off for a distance of approximately 2,800 feet to reach approximate longitude 81°23'50" west, approximate latitude 19°21'22" north, thence in a north easterly direction for approximately 2,800 feet to reach the coast at the south west corner of Victoria House Block No. 10E Parcel No. 2 approximate longitude 81°23'26" west, approximate latitude 19°21'15" north.

Thence in a north westerly direction along the coast to reach the starting point.

1C Treasure Island Resort - Old Pageant Beach Site

Starting at a point longitude 81°23'12" west, latitude 19°18'31" north on the coast in Block 13E, Parcel 156, thence in a westerly direction for a distance of approximately 2,050 feet to the drop-off approximate longitude 81°23'32" west, approximate latitude 19°18'31" north.

Thence in a generally northerly direction along the drop-off for a distance of approximately 1,750 feet to reach approximate longitude 81°23'38" west, approximate latitude 19°18'48" north.

Thence in an easterly direction for a distance of approximately 2,550 feet to reach the coast in Block 13B, Parcel 197 REM 1 at longitude 81°23'13" east, latitude 19°18'48" north.

Thence in a generally southerly direction along the coast to reach the starting point.

ID South Sound

Starting on the coast at the jetty on the southern boundary of Block No. 150 Parcel No. 63 (Caribbean Paradise) approximate longitude 81°22'44" west, approximate latitude 19°15'19" north, thence in a southerly direction for approximately 1,000 feet crossing the west side of the wreck of the Pallas to reach the outer edge of the reef at approximate longitude 81°22'44" west, approximate latitude 19°15'49" north.

Thence along the outer edge of the reef in a north easterly direction for approximately 14,000 feet to reach the coast at Prospect Point Block No. 23C Parcel No. 56 approximate longitude 81°20'02" west, approximate latitude 19°16'17" north.

Thence along the coast in north westerly, westerly and south westerly directions to reach the starting point.

1E-North Sound

Starting at Rum Point Block No. 33B Parcel No 171 (e) approximate longitude 81°16'19" west, approximate latitude 19°22'22" north, thence in a northerly direction for a distance of approximately 2,200 feet to the reef approximate longitude 81°16'19" west approximate latitude 19°22'44" north.

Thence in a westerly direction along the outer edge of the reef for a distance of approximately 8,000 feet to reach approximate longitude 81°17'41" west, approximate latitude 19°22'43" north. Thence in a south westerly direction crossing to the east of Rum Point channel, for a distance of approximately 14,400 feet to reach approximate longitude 81°19'41" west, approximate latitude 19°21'16" north.

Thence in a southerly direction for a distance of approximately 21,500 feet to reach the coast at the north east corner of Block No. 24B Parcel No. 2 approximate longitude 81°19'41" west, approximate latitude 19°17'44" north.

Thence in a generally north easterly direction along the coast passing through Block Nos. 24B, 24C, 27B, 27C and part of 30A to reach the common boundary of Block No. 30A Parcel Nos. 5 and 8 at approximate longitude 81°17'26" west, approximate latitude 19°18'40" north.

Thence in westerly, south westerly and north westerly directions along the coast and across the waterway to the southern boundary of Duck Pond Cay approximate longitude 81°17'57" west, approximate latitude 19°18'31" north.

Thence in a northerly direction along the west coast of Duck Pond Cay and through the North Sound for a distance of approximately 8,400 feet to a point 1,300 feet west of Booby Cay, approximate longitude 81°17'57" west, approximate latitude 19°19'54" north.

Thence in a north easterly direction for a distance of approximately 14,500 feet to reach the coast at Block No. 33D Parcel No. 21, approximate longitude 81°16'07" west, approximate latitude 19°21'33" north.

Thence along the coast line of Block No. 33E to reach approximate longitude 81°16'19" west, approximate latitude 19°21'45" north.

Thence in a westerly direction across part of North Sound to reach the coast at Water Cay Block No. 33E Parcel No. 75.

Thence along the coast through Block Nos. 33E, 33M, and 33B to reach the starting point.

1F Bats Cave Beach

Starting on the coast at the eastern boundary of Block No. 25B Parcel No. 8 where the reef meets the land, approximate longitude 81°19'27" west, approximate latitude 19°16'22" north, thence along the outer edge of the reef in

south easterly, easterly and north easterly directions for a distance of approximately 6,700 feet to reach the coast at Head of Reef Block No. 28E Parcel No. 23 approximate longitude 81°18'22" west, approximate latitude 19°16'11" north.

Thence in north westerly and westerly directions along the coast to reach the starting point.

IG Frank Sound

Starting on the coast at the southern boundary of Block No 56C Parcel No. 1 approximate longitude 81°10'59" west, approximate latitude 19°18'00" north, thence in a south easterly direction for approximately 3,100 feet to the channel, approximate longitude 81°10'55" west, approximate latitude 19°17'30" north. Thence along the outer edge of the reef in an easterly direction for approximately 11,000 feet to reach the coast at Block No 64A Parcel No. 27 approximate longitude 81° 09'00" west, approximate latitude 19° 17'39" north.

Thence along the coast in a generally north westerly direction to reach the starting point.

1H Cayman Dive Lodge

Starting on the coast at the southern boundary of Block No. 72B Parcel No. 17 where the reef meets the land, approximate longitude 81°07'11" west, approximate latitude 19°17'35" north, thence in an easterly direction along the outer edge of the reef for a distance of approximately 1,950 feet to reach approximate longitude 81°06'51" west, approximate latitude 19° 17'35" north. Thence in a northerly direction to reach the coast at the southern boundary of Block No. 72C Parcel No. 193, approximate longitude 81°06'51" west, approximate latitude 19°17'40" north.

Thence in a south westerly direction along the coast to reach the starting point.

1J Radio Mast- Sand Bluff

Starting on the coast at the eastern boundary of Block No. 75A Parcel No. 130, approximate longitude 81°05'28" west, approximate latitude 19°18'34" north, thence in an easterly direction for a distance of approximately 5,200 feet to reach the outer edge of the reef just south of East End channel, approximate longitude 81°04'33" west, approximate latitude 19°18'34" north.

Thence in a north westerly direction along the outer edge of the reef for a distance of approximately 4,100 feet to reach approximate longitude 81°04'42" west, approximate latitude 19°19'13" north, thence in a westerly direction for a distance of approximately 2,900 feet to reach the coast at Sand Bluff on the eastern boundary of Block No. 75A Parcel No. 3, approximate longitude 81°05'13" west, approximate latitude 19°19'13" north.

Thence in a south westerly direction along the coast to reach the starting point.

1K Spotter Bay - Anchors Point

Starting on the coast at Spotter Bay Block No. 73A Parcel No. 1 approximate longitude 81°05'57" west, approximate latitude 19°21'12" north, thence in a westerly direction along the outer edge of the reef for a distance of approximately 11,600 feet to reach the coast at Anchors Point at the northern boundary of Block No. 65A Parcel No. 22, approximate longitude 81°07'58" west, approximate latitude 19°21'18" north.

Thence in an easterly direction along the coast to reach the starting point.

Cayman Brac-Replenishment Zones

1L Spot Bay

Starting on the coast at the north east corner of Block No. 108D Parcel No. 23 (Spot Bay School) approximate longitude 79°45'04" west, approximate latitude 19°45'16" north, thence in a northerly direction for a distance of approximately 250 feet to reach the outer edge of the reef, approximate longitude 79°45'04" west, approximate latitude 19°45'19" north.

Thence along the outer edge of the reef in a south westerly direction for a distance of approximately 4,000 feet to where the reef reaches the coast at the north west corner of Block No. 108E Parcel No. 7 approximate longitude 79°45'44" west, approximate latitude 19°45'04" north.

Thence along the coast in a north easterly direction to reach the starting point.

1M Salt Water Point - Beach Point

Starting on the coast at Salt Water Point Block No. 97C Parcel No. 22 where the reef meets the coast, approximate longitude 79°51'10" west, approximate latitude 19°41'22" north, thence along the outer edge of the reef for a distance of

approximately 4,500 feet to reach approximate longitude 79°50'26" west, approximate latitude 19°41'31" north.

Thence in a northerly direction for a distance of approximately 950 feet to reach the coast at Beach Point, Block No. 99A, Parcel No. 82, approximate longitude 79°50'26" west, approximate latitude 19°41'38" north.

Thence along the coast in a south westerly direction to reach the starting point.

1N Coral Isle Club

Starting on the coast at Block No. 95C Parcel No. 62 approximate longitude 79°52'04" west, approximate latitude 19°41'08" north. Thence in a south easterly direction for a distance of approximately 200 feet to reach the outer edge of the reef, at approximate longitude 79°52'04" west, approximate latitude 19°41'06" north.

Thence along the outer edge of the reef in a north easterly direction for a distance of approximately 2,900 feet to reach the coast at Block No. 97B Parcel No. 32 approximate longitude 79°51'37" west, approximate latitude 19°41'15" north, thence in a south westerly direction along the coast to reach the starting point.

Little Cayman-Replenishment Zones

1P Mary's Bay - East Point

Starting on the coast at Mary's Bay, Block No. 189A, Parcel No. 29 approximate longitude 79°59'52" west, approximate latitude 19°42'20" north, thence in a northerly direction for a distance of approximately 2,150 feet to reach the drop-off approximate longitude 79°59'52" west, approximate latitude 19°42'42" north.

Thence along the drop-off in a north easterly direction for a distance of approximately 8,600 feet. to reach longitude 79°58'28" west, approximate latitude 19°43'12" north, thence in a southerly direction for a distance of approximately 1,250 feet to reach the outer edge of the reef, approximate longitude 79°58'28" west, approximate latitude 19°42'58" north.

Thence along the outer edge of the reef in south easterly and southerly directions for a distance of approximately 7,300 feet, to reach approximate longitude 79°57'34" west, approximate latitude 19°42'38" north.

Thence in a westerly direction for a distance of approximately 1,000 feet to reach the coast at East Point, Block No. 92A Parcel No. 30, approximate longitude 79° 57'44" west, approximate latitude 19°42'38" north.

Thence along the coast in north westerly and south westerly directions to reach the starting point.

IQ South Hole Sound

Starting on the coast at Head of Bay, Block No. 83A Parcel No. 12, approximate longitude 80°04'03" west, approximate latitude 19°39'57" north, thence in a south easterly direction for a distance of approximately 2,350 feet to reach the outer edge of the reef approximate longitude 80°03'44" west, approximate latitude 19°39'45" north.

Thence along the outer edge of the reef for a distance of approximately 27,000 feet to reach approximate longitude 79°59'34" west, approximate latitude 19°41'36" north, thence in a north westerly direction for a distance of approximately 1,200 feet to reach the coast at Block No. 91A, Parcel No. 40 approximate longitude 79°59'32" west, approximate latitude 19°41'47" north.

Thence along the coast in south westerly, north westerly and southerly directions to reach the starting point.

SECOND SCHEDULE

Grand Cayman-Marine Park Zones

2A Spanish Cove Resort-Jetty (3D 16)

Starting on the coast at the north east corner of Block No. 3D Parcel No. 22 approximate longitude 81°23'40" west, approximate latitude 19°23'40" north, thence due north for a distance of approximately 900 feet to the drop-off approximate longitude 81°23'40" west, approximate latitude 19°23'49" north.

Thence along the drop-off in a south westerly direction for a distance of approximately 1,250 feet to reach approximate longitude 81°23'52" west, approximate latitude 19°23'43" north, thence due south for a distance of approximately 700 feet to reach the jetty on the coast, at the northern boundary of Block No. 3D Parcel No. 16 approximate longitude 81°23'52" west, approximate latitude 19°23'36" north.

Thence in a north easterly direction along the coast to reach the starting point.

2B North West Point - West Bay Cemetery

Starting on the coast at the boardwalk on the north west boundary of Block No. 2C Parcel No. 67 approximate longitude 81°25'13" west, approximate latitude 19°22'20" north.

Thence in a westerly direction for approximately 1,500 feet to reach the drop-off; approximate longitude 81°25'23" west approximate latitude 19°22'20" north.

Thence along the drop-off in a south easterly direction for a distance of approximately 8,500 feet, to reach approximate longitude 81°24'09" west approximate latitude 19°21'43" north, thence in a north easterly direction for a distance of approximately 2,500 ft to reach the coast at the north west corner of the cemetery Block No. 5C Parcel No. 124 approximate longitude 81°23'49" west approximate latitude 19°21'56" north.

Thence in a north westerly direction along the coast to reach the starting point.

2C Victoria House - Sand Cay Apartments

Starting on the coast at the south west corner of Victoria House Block No. 10E Parcel No. 2 approximate longitude 81°23'26" west approximate latitude 19°21'35" north thence in a south westerly direction for a distance of approximately 2,800 feet to reach the drop-off approximate longitude 81°23'50" west approximate latitude 19°21'22" north.

Thence in a southerly direction along the drop-off for approximately 32,500 feet to reach approximate longitude 81°23'46" west approximate latitude 19°16'10" north, thence in an easterly direction for approximately 1,600 feet to reach the coast at the north west corner of Sand Cay apartments Block No. 7D Parcel No. 8, approximate longitude 81°23'30" west approximate latitude 19°16'10" north.

Thence along the coast in a generally northerly direction to reach the starting point.

2D Bowse Bluff - Rum Point

Starting on the coast at Bowse Bluff Block No. 33C Parcel No. 12 approximate longitude 81°15'44" west, approximate latitude 19°21'57" north, thence in a northerly direction for a distance of approximately 1,200 feet to the reef approximate longitude 81°15'44" west, approximate latitude 19°22'09" north.

Thence in a north westerly direction along the reef for a distance of approximately 5,000 feet to approximate longitude 81°16'19" west, approximate latitude 19°22'44" north, thence in a southerly direction for a distance of approximately 2,200 feet to reach the coast at Rum Point, Block No. 33B Parcel No. 171(e) at approximate longitude 81°16'19" west, approximate latitude 19°22'22" north.

Thence in a south easterly direction along the coast to reach the starting point.

Cayman Brac-Marine Park Zones

2E Scotts Anchorage - White Bay

Starting on the coast at the north west corner of Block No. 95B Parcel No. 9 (Buccaneers Inn) approximate longitude 79°53'03" west, approximate latitude 19°41'43" north.

Thence along the drop-off in a north easterly direction for a distance of approximately 4,100 feet to reach approximate longitude 79°52'33" west, approximate latitude 19°42'04" north.

Thence in a south easterly direction for a distance of approximately 1,150 feet to reach the shore at White Bay Block No. 94D, Parcel No. 24 approximate longitude 79°52'27" west, approximate latitude 19°41'54" north.

Thence in a south westerly direction along the coast to reach the starting point.

2F Dick Sessinger's Bay - Beach Point

Starting on the outer edge of the reef, 600 feet east of Channel Bays channel, approximate longitude 79°53'02" west, approximate latitude 19°40'56" north, thence in a southerly direction for a distance of approximately 1,400 feet to reach the drop-off, approximate longitude 79°53'02" west, approximate latitude 19°40'44" north.

Thence along the drop-off in a generally north easterly direction for a distance of approximately 16,000 feet to reach approximate longitude 79°50'26" west, approximate latitude 19°41'25" north, thence in a northerly direction for a distance of approximately 600 feet to reach the outer edge of the reef at approximate longitude 79°50'26" west, approximate latitude 19°41'31" north.

Thence along the coast in a south westerly direction for a distance of approximately 2,500 feet to reach Block No. 97B Parcel No. 32 where the reef

meets the coast, approximate longitude 79°51'36" west, approximate latitude 19°41'09" north.

Thence along the outer edge of the reef in a south westerly direction to reach the starting point.

2G Jennifer Bay - Deep Well

Starting on the coast at Block No. 105A Parcel 16 approximate longitude 79°47'47" west, approximate latitude 19°42'38" north, thence in a southerly direction for a distance of approximately 1,100 feet, to reach the drop-off, approximate longitude 79°47'47" west, approximate latitude 19°42'27" north.

Thence along the drop-off in a north easterly direction for a distance of approximately 6,000 feet to reach approximate longitude 79°46'47" west, approximate latitude 19°42'43" north.

Thence in a northerly direction for a distance of approximately 1,200 feet to reach the coast at Block No.107A, Parcel No. 56 approximate longitude 79°46'47" west, approximate latitude 19°42'54" north.

Thence along the coast in a south westerly direction to reach the starting point.

Little Cayman-Marine Parks Zones

2H Bloody Bay - Jackson Point

Starting on the coast at Spot Bay Block No.77A, Parcel No.6 approximate longitude 80°05'04" west approximate latitude 19°40'31" north, thence in a north westerly direction for a distance of approximately 900 feet to reach the drop-off approximate longitude 80°05'45" west, approximate latitude 19°40'38" north.

Thence along the drop-off in a generally north easterly direction for a distance of approximately 14,800 feet to reach approximate longitude 80°03'41" west, approximate latitude 19°42'05" north.

Thence in a south easterly direction for a distance of approximately 2,050 feet to reach the coast at Lower Spots, Block No. 82A, Parcel No.12, approximate longitude 80°03'38" west, approximate latitude 19°41'45" north.

Thence along the coast in a generally south westerly direction to reach the starting point.

2J Preston Bay - Main Channel

Starting on the coast at Block No.78A, Parcel No.10 where the reef meets the land, approximate longitude 80°05'44" west approximate latitude 19°39'33" north, thence along the outer edge of the reef in a south westerly direction for a distance of approximately 2,000 feet, to reach approximate longitude 80° 06' 04" west, approximate latitude 19°39'26" north.

Thence in a southerly direction for a distance of approximately 1,950 feet to reach the drop-off, approximate longitude 80°06'04" west, approximate latitude 19°39'07" north.

Thence along the drop-off in north easterly and south easterly directions for a distance of approximately 9,000 feet to reach approximate longitude 80°04'34" west, approximate latitude 19°39'07" north.

Thence in a northerly direction for a distance of approximately 1,800 feet to reach the Main Channel, approximate longitude 80°04'34" west, approximate latitude 19°39'23" north.

Thence along the outer edge of the reef in south westerly and north westerly directions for a distance of approximately 3,600 feet to reach the coast at Block No. 81A, Parcel 38, approximate longitude 80°05'11" west, approximate latitude 19°39'27" north.

Thence along the coast in a north westerly direction to reach the starting point.

THIRD SCHEDULE

Grand Cayman -Environmental Zones

3A Little Sound

Starting on the coast at Block No. 33 D Parcel No. 21 approximate longitude 81°16'07" west approximate latitude 19°21'33" north. Thence in a south westerly direction for approximately 14,500 feet to a point 1,300 feet off the west coast of Booby Cay approximate longitude 81°17'57" west, approximate latitude 19°19'54" north.

Thence in a southerly direction for a distance of approximately 8,400 feet to reach the western coast of Duck Pond Cay approximate longitude 81°17'57" west, approximate latitude 19°18'31" north.

Thence along the southern boundary of Duck Pond Cay and across the waterway and along the southern boundary of Block No. 30A Parcel No.5 to reach approximate longitude 81°17'26" west, approximate latitude 19°18'40" north.

Thence inland in a generally north easterly direction parallel to the coast through Block Nos. 30A, 29A, 35A and 41A approximately 2,000 feet from the coast to reach a point in Block No. 41A approximate longitude 81°15'09" west approximate latitude 19°19'21" north.

Thence in a north westerly direction for approximately 1,800 feet over Block No. 41A, approximately 2,000 feet from the coast to reach approximate longitude 81°15'11" west, approximate latitude 19°19'31" north.

Thence continuing in a north westerly direction for a distance of approximately 1,900 feet through Block No. 41A and into Block No. 40A approximately 2,000 feet from the coast to reach approximate longitude 81°15'12" west approximate latitude 19°20'04" north.

Thence continuing in a north westerly direction through Block No.40A for approximately 1,900 feet, approximately 1,000 feet from the coast to reach approximate longitude 81°15'21" west, approximate latitude 19°20'36" north.

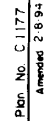
Thence continuing in a north westerly direction for a distance of approximately 2,300 feet through Block No. 40A, approximately 800 feet from the coast to reach approximate longitude 81°15'32" west, approximate latitude 19°20'55" north.

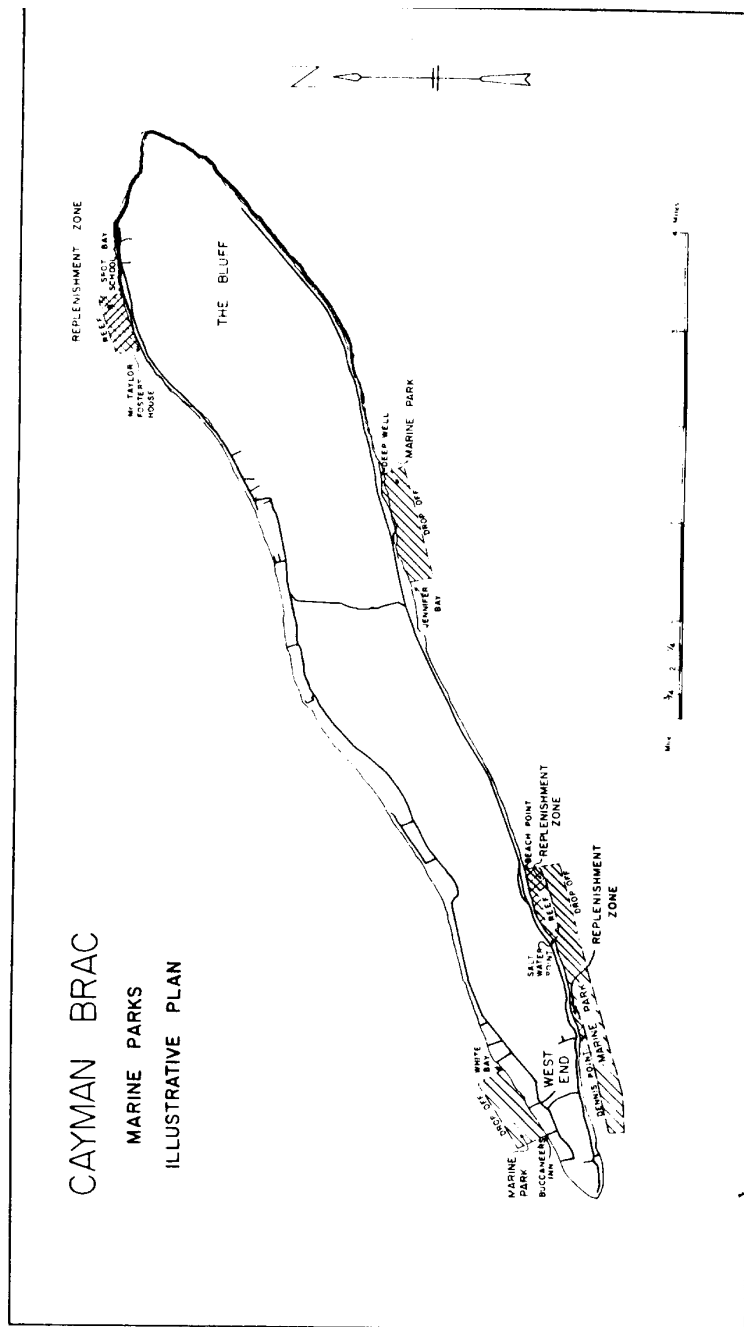
Thence continuing in a north westerly direction for a distance of approximately 5,100 feet to reach the starting point.

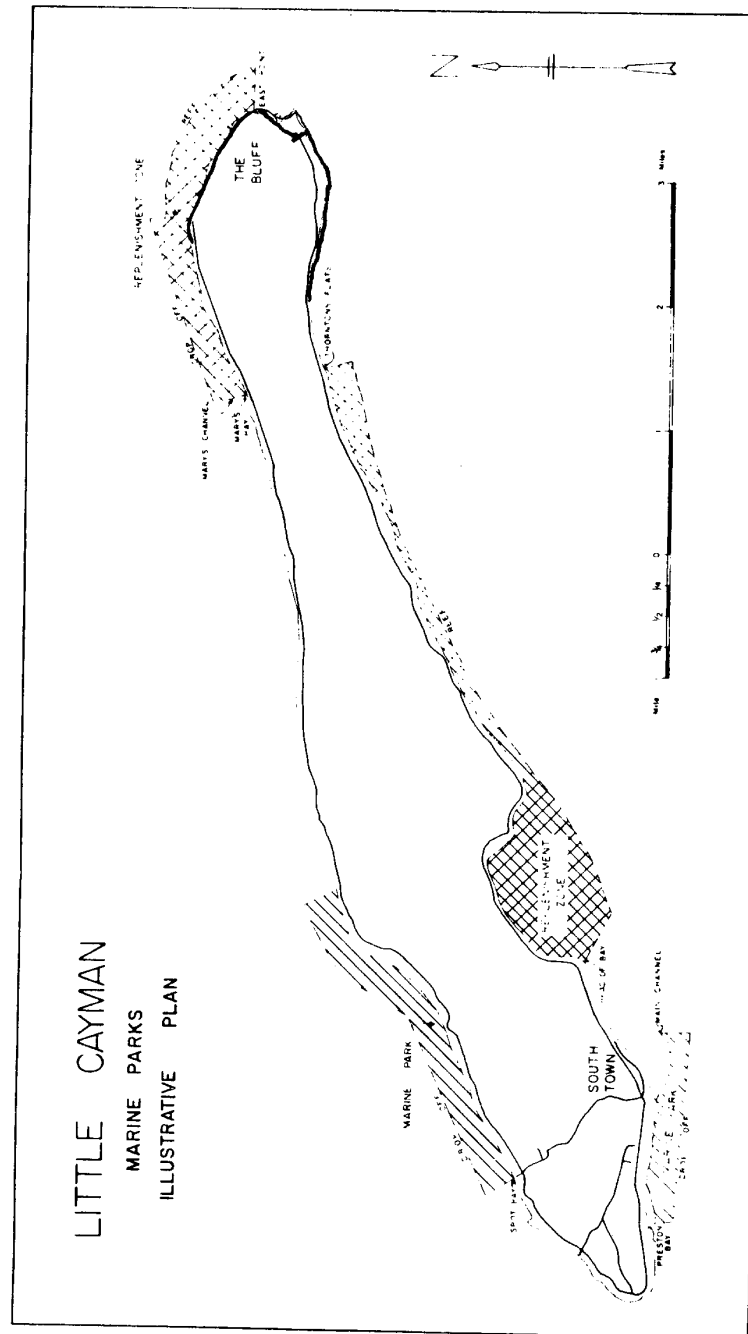
FOURTH SCHEDULE

(Regulation 8(4))

Illustrative Plans







Publication in consolidated and revised form authorised by the Governor in Council this 11th day of June, 1996.

Mona N. Banks-Jackson
Clerk of Executive Council

Supplement No. 2 published with Gazette No. 15 of 20th July, 1998.

MARINE CONSERVATION LAW

(1995 Revision)

THE RESTRICTED MARINE AREAS (DESIGNATION) REGULATIONS

(1998 Revision)

Revised under the authority of the Law Revision Law (19 of 1975).

The Restricted Marine Areas (Designation) Regulations, 1985 made the 2nd January, 1985.

Revised this 16th day of June , 1998.

RESTRICTED MARINE AREAS (DESIGNATION) REGULATIONS

(1998 Revision)

ARRANGEMENT OF REGULATIONS

1. Citation
 2. Designation
 3. Restriction upon entry
 4. Penalty
- Schedule: Designated Restricted Marine Areas

RESTRICTED MARINE AREAS (DESIGNATION) REGULATIONS

(1998 Revision)

1. These regulations may be cited as the Restricted Marine Areas (Designation) Regulations (1998 Revision).	Citation
2. The areas specified in the Schedule hereto are designated as Restricted Marine Areas.	Designation
3. Whoever, without a licence issued by the Board, enters a Restricted Marine Area is guilty of an offence.	Restriction upon entry
4. Any person guilty of an offence is liable on summary conviction to a fine of five hundred dollars and to imprisonment for six months, and the Court so convicting may order forfeiture under section 21.	Penalty

SCHEDULE

Designated Restricted Marine Areas

- (a) The area off East End, Grand Cayman known as Coxswain Bank which area is more particularly described and demarcated as lying between 19° 20' 28" North latitude 81° 4' 39" West longitude and 19° 20' 58" North latitude 81° 4' 39" West longitude and 19° 20' 58" North latitude, 81° 4' 0" West longitude, 19° 20' 28" North latitude, 81° 4' 12" West longitude.
- (b) The area of the north east part of Little Cayman known as the Grouper Hole which area is more particularly described and demarcated as lying between 19° 42' 48" North latitude, 79° 56' 42" West longitude and 19° 41' 48" North latitude, 79° 57' 42" West longitude and 19° 41' 48" North latitude, 79° 57' 42" West longitude, 19° 42' 48" North latitude, 79° 57' 42" West longitude, 19° 42' 48" North latitude 79° 57' 42" West longitude.
- (c) The grouper spawning area off the north east point of Cayman Brac which area is more particularly described and demarcated as lying between 19° 44' 41" North latitude, 79° 42' 33" West longitude and 19° 45' 26" North latitude, 79° 42' 33" West longitude and 19° 45' 26" North latitude 79° 43' 24" West longitude and 19° 44' 41" North latitude, 79° 43' 24" West longitude.

Publication in revised form authorised by the Governor in Council this 16th day of June , 1998.

Carmena H. Parsons
Clerk of Executive Council

Note (not forming part of the regulations): On 2nd January, 1985, the Governor in Council issued a general licence under sections 4 and 10 of the Law which provided that all persons ordinarily resident in the Islands are licensed to enter upon the restricted marine area designated under the Restricted Marine (Designation) Regulations but are prohibited from fishing by or using fish traps, spear guns, explosives, seine nets or any other forms of nets.

Endangered Species Protection and Propagation Law

Supplement No. 7 published with Gazette No. 16 of 2nd August, 1999.

**THE ENDANGERED SPECIES PROTECTION AND PROPAGATION
LAW (21 OF 1978)**

(1999 Revision)

Law 21 of 1978 consolidated with Law 12 of 1983.

Revised under the authority of the Law Revision Law (1999 Revision).

Originally enacted-

Law 21 of 1978-12th September, 1978

Law 12 of 1983-24th February, 1983

Consolidated and revised this 8th day of June, 1999.

ENDANGERED SPECIES PROTECTION AND PROPAGATION LAW

(1999 Revision)

I. This Law may be cited as the Endangered Species Protection and Propagation Law (1999 Revision).

Short title

2. In this Law-

Definitions

"live or dead animal" and "plant" includes the parts and products thereof itemised in the Schedule; and

"Governor" means the Governor in Council.

3. (1) The importation and exportation of live or dead animals and plants referred to in the Schedule is, subject to sections 4 and 8, prohibited.

Import and export of
certain animals and
plants prohibited

(2) Where a live or dead animal or plant of any *of* the families for the time being specified in Parts I and 11 *of* the Schedule or an article for the time being specified in Part III *of* the Schedule is being imported or exported or has been imported to any place in the Islands for the purpose *of* being exported, any customs officer may require any person possessing or having control of the animal, plant or article to furnish proof that its importation or exportation is or was not unlawful by virtue of this section; and if such proof is not furnished to the satisfaction of such customs officer such animal, plant or article is liable to forfeiture.

4. (1) Section 3 has no application to live or dead animals or plants the subject of a licence issued by the Governor.

Exceptions

(2) For the avoidance of doubt it is hereby declared that section 3 has no application to the bringing into the Islands of turtles taken within the fishery limits of the Islands if taking such turtles is customary and traditional and the turtles are intended only for consumption by persons within the Islands.

5. Application for a licence under section 4 may be made to the Governor who may grant such a licence only upon the recommendation of the Chief Agricultural and Veterinary Officer.

licence application

6. Licences granted under section 4 are revocable by the Governor at any time and shall, in any event, expire after one year from the date of issue or after any

Endangered Species Protection and Propagation Law (1999 Revision)

shorter period therein specified and are subject to such general or special conditions as the Governor may impose including conditions as to the place and mode of import or export, the premises where the licensed animal or plant shall be kept when in the Islands and quarantine requirements.

Prohibition on killing

7. (1) The Governor may, by Order published in the Gazette, prohibit the killing within the Islands, the territorial waters or the fisheries zone thereof, and for such period as may be therein specified, of such animals, being animals listed in the Schedule, as are specified in such Order.

(2) Whoever contravenes subsection (1) is guilty of an offence and liable on summary conviction to a fine of ten thousand dollars and to imprisonment: three years.

(3) Where any offence under this section is committed by any company or other body corporate or by any society, association or body of persons, every person charged with or concerned or acting in control or management of the affairs of such company, body corporate, society, association or body of persons, shall also be guilty of such offence unless he proves that such offence was committed without his knowledge or consent and that he took all reasonable steps to prevent the commission of the offence.

Regulations

8. The Governor may make regulations prescribing-

- (a) the forms to be used for the purposes of this Law;
- (b) fees upon application and the grant of licences;
- (c) for the making and certification of products produced under licence;
- (d) amendments to the Schedule; and
- (e) such other matters as may be desirable for the implementation of this Law.

9. Whoever-

- (a) contravenes section 3;
- (b) makes any statement orally or in writing or propounds any document in the truth of which he does not believe for the purpose of obtaining a licence or other advantage under this Law, the onus of showing his belief being upon him;
- (c) handles, deals in or has in his possession any animal or plant introduced into the islands in contravention of section 3; or
- (d) contravenes any term or condition of a licence granted to him under this Law,

is guilty of an offence and liable on summary conviction to a fine of eight hundred dollars and to imprisonment for two years.

SCHEDULE

**CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED
SPECIES OF WILD FAUNA AND FLORA**

PART I

Interpretation:

1. Species included in this Part are referred to-
 - (a) by the name of the species; or
 - (b) as being all of the species included in a higher taxon or designated part thereof.
2. The abbreviation "spp." is used to denote all species of a higher taxon.
3. Other references to taxa higher than species are for the purpose of information or classification only.
4. An asterisk (*) placed against the name of a species or higher taxon indicates that one or more geographically separate populations, sub-species or species of that taxon are included in Part II and that these populations, sub-species or species are excluded from Part I.
5. The symbol (-) followed by a number placed against the name of a species or higher taxon indicates the exclusion from that species or taxon of designated geographically separate populations, sub-species or species as follows-
 - 101 Lemur catta
 - 102 Australian population.
6. The symbol (+) followed by a number placed against the name of a species denotes that only a designated geographically separate population or sub-species of that species is included in this Part as follows-
 - +201 Italian population only.
7. The symbol (+) placed against the name of a species or higher taxon indicates that the species concerned are protected in accordance with the International Whaling Commission's schedule of 1972.

Endangered Species Protection and Propagation Law (1999 Revision)

Meliphagidae	Helmeted Honeyeater	Meliphaga cassidix
Zosteropidae	White-breasted Silveryeye	Zosterops albogularis
Fringillidae	Red Siskin	Spinus cucullatus
AMPHIBIA		
UPODELA		
Cryptobranchidae	Japanese Giant Salamander	Andrias (=Megalobatrachus) davidianusjaponicus
	Chinese Giant Salamander	Andrias (= Megalobatrachus) davidianus davidianus
SALIENTIA		
Bufonidae	Cameroon Toad	Bufo superciliaris
	Monte Verde Toad	Bufo periglenes
	Viviparous Toads	Nectophrynoides spp.
Atelopodidae	Golden Frog	Atelopus varius zeteki.
REPTILIA		
CROCODYLIA		
Alligatoridae	American Alligator	Alligator mississippiensis
	Chinese Alligator	Alligator sinensis
	Black Caiman	Melanosuchus niger
	Apaporis River Caiman	Caiman crocodilus apaporiensis
	Broad-Snouted Caiman	Caiman latirostris
Crocodylidae	Tomistoma	Tomistoma schlegelii
	African Dwarf Crocodile	Osteolaemus tetraspis tetraspis
	Congo Dwarf Crocodile	Osteolaemus tetraspis osborni
	African Slender-snouted Crocodile	Crocodylus cataphractus
	Siamese Crocodile	Crocodylus siamensis
	Mugger Crocodile	Crocodylus palustris palustris
	Ceylon Mugger Crocodile	Crocodylus palustris kimbula
	Philippine Crocodile	Crocodylus novaeguineae mindorensis
	Orinoco Crocodile	Crocodylus intermedius
	Cuban Crocodile	Crocodylus rhombifer
	Morelet's Crocodile	Crocodylus moreletii
	Nile Crocodile	Crocodylus niloticus
Gavilalidae	Gavial	Gavialis gangeticus
TESTUDINATA		
Emydidae	Asian River Terrapin	Batagur baska
	Hamilton's Terrapin	Geoclemmys (=Damonina) hamiltonii
	Bengal Three-keeled Terrapin	Geoemyda (=Nicoria) tricarinata
	Roof Terrapin	Kachuga tecta tecta

Endangered Species Protection and Propagation Law (1999 Revision)

	Bengal Eyed Terrapin	Morenia ocellata
	Water Box Tortoise	Terrapene coahuila
Testudinidae	Galapagos Tortoise	Geochelone (=Testudo) elephantopus
	Geometric Tortoise	Geochelone (=Testudo) geometrica
	Madagascar Radiated Tortoise	Geochelone (=Testudo) radiata
	Madagascar Tortoise	Geochelone (=Testudo) yniphora
Cheloniidae	Hawksbill Turtle	Eretmochelys imbricata imbricata
	Atlantic Ridley Turtle	Lepidochelys kempii
Trionychidae	Spotted Softshell Terrapin	Lissemys punctata punctata
	Coahuilan Softshell Terrapin	Trionyx ater
	Sacred Softshell Terrapin	Trionyx nigricans
	Ganges Softshell Terrapin	Trionyx gangeticus
	Brown Softshell Terrapin	Trionyx hurum
Chelidae	Short-necked Terrapin	Pseudemys umbrina
LACERTILIA		
Varanidae	Komodo Monitor	Varanus komodoensis
	Yellow Monitor	Varanus flavescens
	Indian Monitor	Varanus bengalensis
	Grey Monitor	Varanus griseus
SERPENTES		
Boidae	Puerto Rican Boa	Epicrates inornatus inornatus
	Jamaica Boa	Epicrates subflavus
	Indian Rock Python	Python molurus molurus
RHYNCHOCEPHALIA		
Sphenodontidae	Tuatara	Sphenodon punctatus
	PISCES	
ACIPENSERIFORMES		
Acipenseridae	Shortnose Sturgeon	Acipenser brevirostrum
	Atlantic Sturgeon	Acipenser oxyrinchus
OSTEOGLOSSIFORMES		
Osteoglossidae	Asiatic Bonytongue	Scleropages formosus
SALMONIFORMES		
Salmonidae	Longjaw Cisco	Corygonus alpenae
CYPRINIFORMES		
Catostomidae	Cui-ui	Chasmistes cujus
Cyprinidae	Pla Fesok	Probarbus julicni
SILURIFORMES		

Endangered Species Protection and Propagation Law (1999 Revision)

**PART 111-ARTICLES THE IMPORTATION AND EXPORTATION OF
WHICH ARE RESTRICTED**

1. Any dead whale.
2. Whale meat (excluding guts, bladders, stomachs, blood and fat) and edible whale offals, whether fresh, chilled, frozen, salted, in brine, dried or smoked, but not if unfit for human consumption.
3. Whalebone, whether unworked or simply prepared but not if cut to shape, and hair and waste of whalebone.
- d. Whale fat and whale oil (other than sperm oil) whether or not refined.
5. Whale meat extracts and whale meat juices.
6. Any bracelet made wholly or partly of the hair of any animal of the family Elephantidae.
7. Ivory derived from the tusks of any animal of the family Elephantidae whether unworked or simply prepared but not if cut to shape, and powder and waste thereon.
8. The horn of any animal of the family Rhinocerotidae, whether unworked or simply prepared but not if cut to shape, and powder and waste thereof.
9. The teeth of any animal, whether unworked or simply prepared but not if cut to shape, and powder and waste thereof.
10. The stuffed head, and the skull together with the skin covering it, of any animal of any of the families Elephantidae and Rhinocerotidae.
- 1 1. Raw furskins and hides or skins, tanned or dressed with the hair on, of any of the following animals and any rug, coverlet, coat, jacket, cape or stole derived from any such furskin, hide or skin, namely-

- (a) any animal of any of the following genera, namely-
Genetta Paradoxurus and Viverra;
- (b) any animal of any of the following species. namely-

Acinonyz jubatus	Felis paradalis	Mangos mungu
Arctogalidia trivigata	Felis planiceps	Panthera nebullosa
Chrotogala uwstoni	Felis rubiginosa	Panthera onca
Crocota crocuta	Felis serval	Panthera pardus

Endangered Species Protection and Propagation Law (1999 Revision)

<i>Fells benegalensis</i>	<i>Fells sylvestris</i>	<i>Panthera tigris</i>
<i>Fells colocolo</i>	<i>Fells tigrina</i>	<i>Panthera uncia</i>
<i>Fells geoffroyi</i>	<i>Fells viverina</i>	<i>Poiana richardsoni</i>
<i>Fells guigna</i>	<i>Fells wiedii</i>	<i>Ursus (Thalarctos)</i> <i>maritimus</i>
<i>Fells jacobita</i>	<i>Fassa fossa</i>	<i>Vicugna vicugna</i> and
<i>Fells marmorata</i>	<i>Hemigatus derbianus</i>	<i>Vivericula indica.</i>
<i>Fells nigripes</i>	<i>Hyaena brunnea</i>	

12. The hair, whether or not carded or combed, of any animal of the species *Vicugna vicugna*.

13. Musk derived from any animal of the sub-species *Moschus moschiferus moschiferus*.

14. A raw hide or skin, whether fresh, salted, dried, pickled or limited and whether or not split, and the leather of any crocodile, lizard or snake.

15. The dried body of any animal of any of the families Alligatoridae and Crocodylidae.

16. The shell and scales, whether unworked or simply prepared but not if cut to shape, the waste of the shell and scales, and the claws, of any animal of the family Cheloniidae.

17. The preserved body of any animal of the sub-species *Antelopes varies zeteki*.

18. The whole shell of any animal of the species *Papustyla (=Papuina) pulcherrima*, whether unworked or simply prepared but not if cut to shape.

19. The feathers, or the skin of any other part with the feathers on it, of any of the following animals. namely-

- (a) any animal of the family of Paradisaeidae; and (b)
- any animal of the species *Gallus sonneratii*.

20. Any fishing fly containing the plumage of any animal of the species *Gallus sonneratii*.

Endangered Species Protection and Propagation Law (1999 Revision)

21. The stem of any plant of the family Cyatheaceae and any article made wholly or partly of any such stem or stems.

22. Any collection of botanical or zoological items, or of both which contains any item referred to in any of the preceding paragraphs of this Schedule.

Publication in consolidated and revised form authorised by the Governor in Council this 8th day of June, 1999.

Carmena H. Parsons
Clerk of Executive Council

Rules for Cayman Islands Marine Parks

MARINE PARK ZONE

- No taking of any marine life alive or dead, except:
 - line fishing from shore is permitted (see FISHING LICENSES section over page);
 - line fishing at depths of 80 ft or greater is permitted;
 - taking fry and sprat with a fry or cast net is permitted.NOTE: fish traps, spear guns, pole spears and other nets are totally prohibited.
- No anchoring - use of fixed moorings only, except:
 - boats of 60 ft or less may anchor in sand, so long as no grappling hook is used, and neither the anchor nor the rope or chain will impact coral;
 - anchoring permitted in designated Port anchorage areas—contact Port Security VHF Channel 16;
 - anchoring prohibitions suspended during emergencies and by permission of Port Director.
- Bloody Bay, Little Cayman - Special restrictions have been placed on the use of the Bloody Bay Marine Park, no commercial operations may use the park without a licence from the Marine Conservation Board.

ENVIRONMENTAL ZONE

- No taking of any marine life, alive or dead with no exceptions;
 - No in-water activities;
 - Public may access only at speeds of 5 m.p.h. or less;
 - No anchoring of any boat.
- NOTE: Line fishing, fish traps, nets, spear guns and strikers are totally prohibited.

REPLENISHMENT ZONE

- No taking of conch or lobster by any means;
 - Line fishing ([see FISHING LICENSES section over page](#)) and anchoring permitted;
 - Anchor, chain or line must not touch coral;
 - Spear guns, pole spears, fish traps and nets prohibited, except that fry and sprat may be taken with a fry or cast net.
- NOTE: These zones include the outside edge of the reef to a depth of 20 feet.

DESIGNATED GROUPER SPAWNING AREAS

- East and West End of: Cayman Brac, Little Cayman and Twelve Mile Bank. Coxswain Bank and South West Point Grand Cayman.
- No fishing for Nassau Groupers in 2003 and during every alternate year after (ie 2005, 2007 etc);
- During open season only line fishing is permitted in these areas by Caymanians;
- No fish pots or spearfishing within one-mile radius of Designated Grouper Spawning Area from 1 November through 31 March.

ANIMAL SANCTUARIES/RAMSAR SITES

- No hunting,
- No collecting of any species,
- No littering.

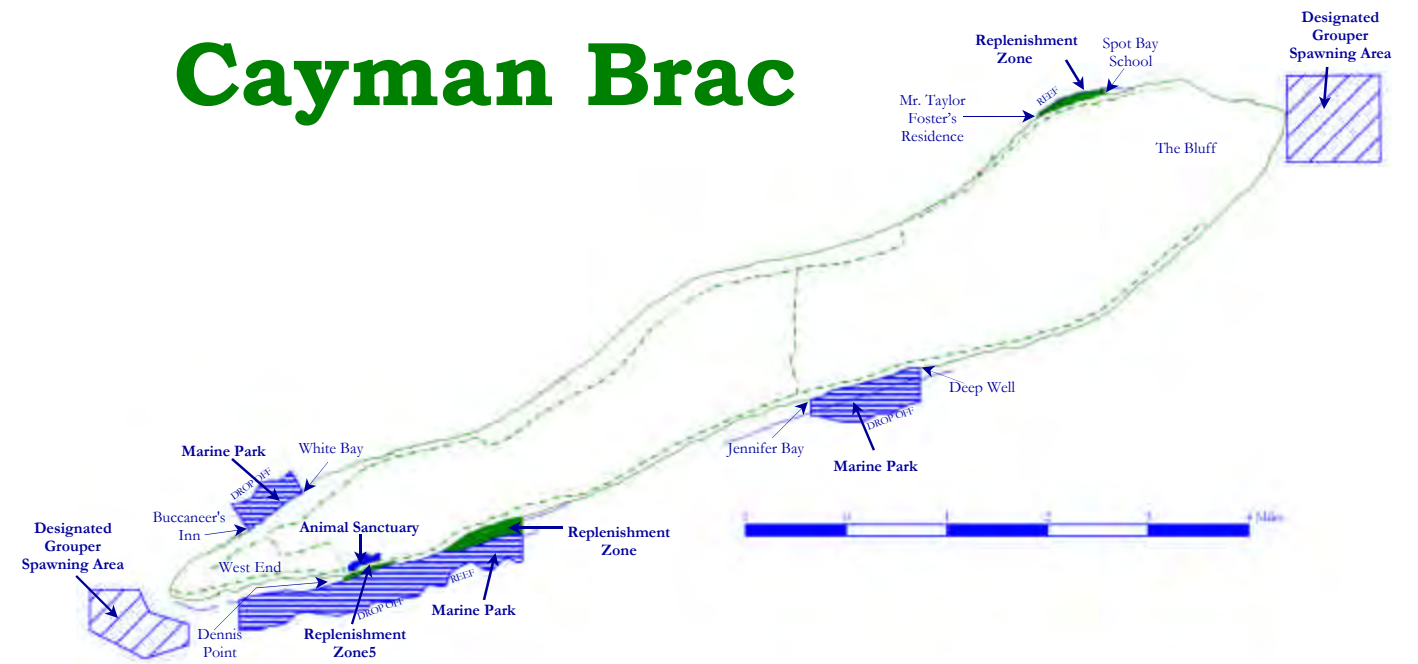
NO DIVING ZONE

- No SCUBA diving.

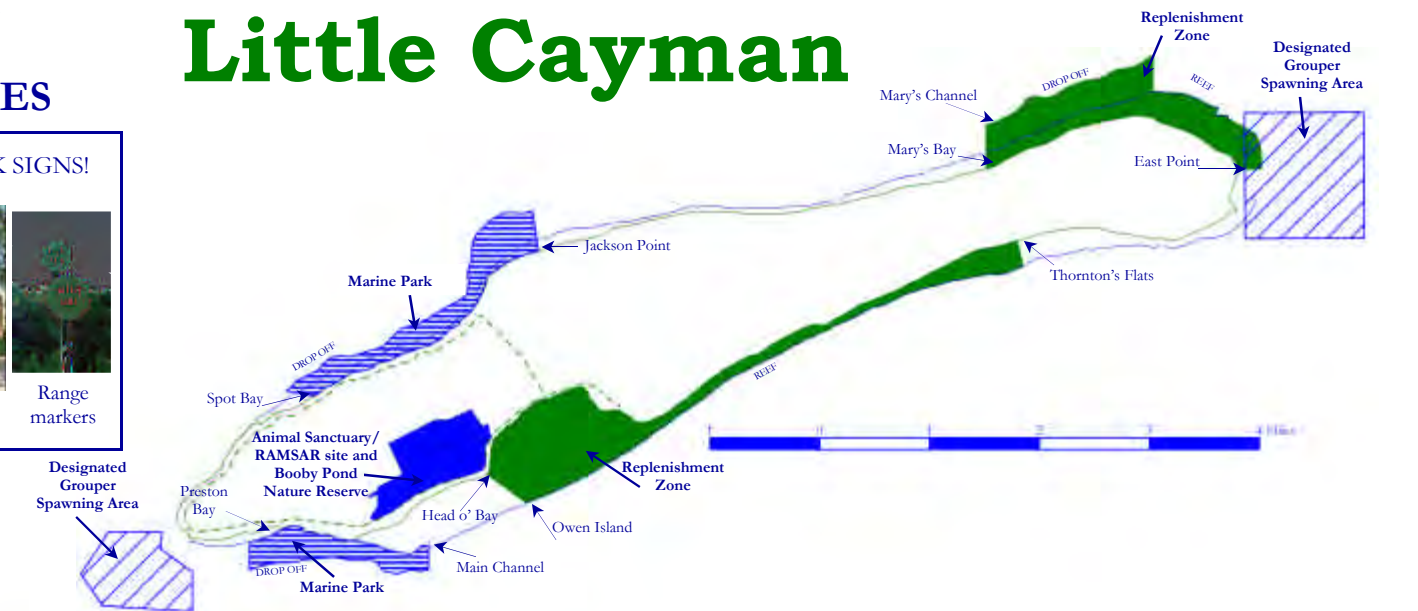
KNOW THE MARINE PARK SIGNS!



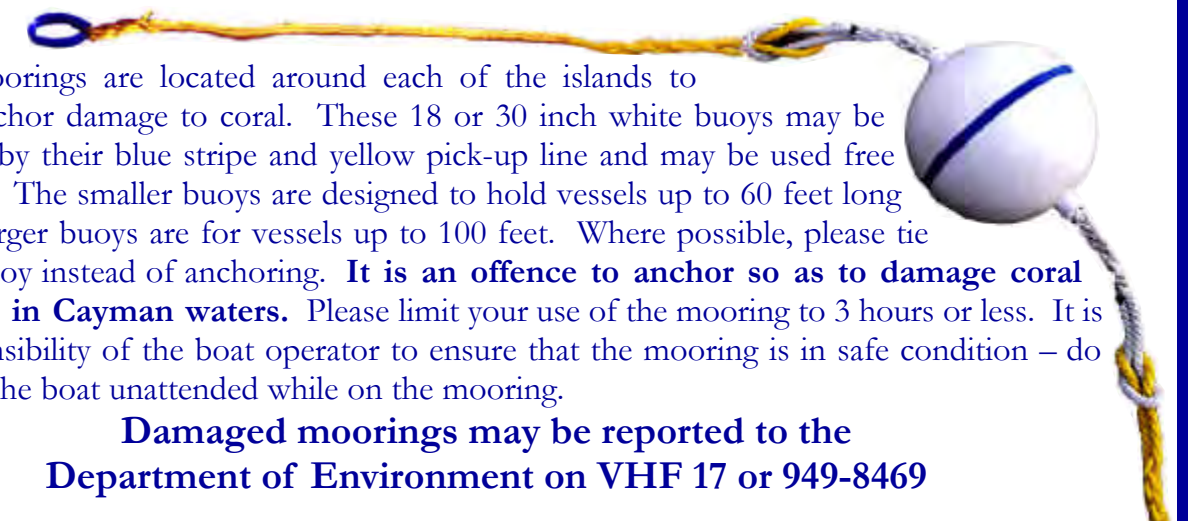
Cayman Brac



Little Cayman



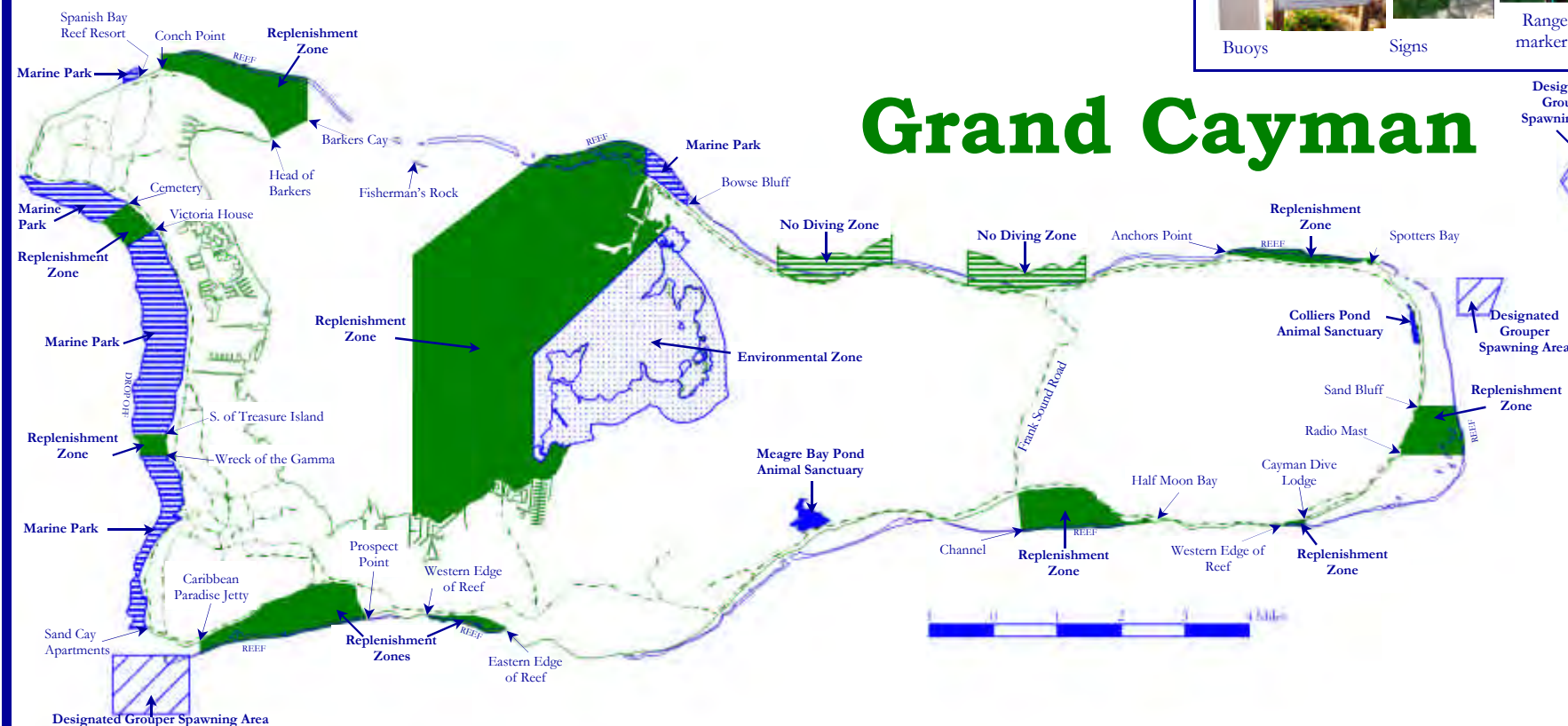
PUBLIC MOORINGS



Public moorings are located around each of the islands to reduce anchor damage to coral. These 18 or 30 inch white buoys may be identified by their blue stripe and yellow pick-up line and may be used free of charge. The smaller buoys are designed to hold vessels up to 60 feet long and the larger buoys are for vessels up to 100 feet. Where possible, please tie up to a buoy instead of anchoring. **It is an offence to anchor so as to damage coral anywhere in Cayman waters.** Please limit your use of the mooring to 3 hours or less. It is the responsibility of the boat operator to ensure that the mooring is in safe condition – do not leave the boat unattended while on the mooring.

**Damaged moorings may be reported to the
Department of Environment on VHF 17 or 949-8469**

Grand Cayman



SUMMARY OF CAYMAN ISLANDS MARINE CONSERVATION LAWS

LOBSTERS

- **Closed season:** 1 March through 30 November. No one may take lobster from Cayman waters during these months. No one may purchase, receive or possess lobster taken from Cayman waters during these months.
- **Open season catch limit:** Three per person or six per boat per day, whichever is less.
- **Size limit:** Six inch tail minimum size.
- Only spiny lobster (*P. argus*) may be taken.

CONCH

- **Closed season:** 1 May through 31 October. No one may take conch from Cayman waters during these months. No one may purchase, receive or possess conch taken from Cayman waters during these months.
- **Open season catch limit:** Five per person or ten per boat per day, whichever is less.
- No one may purchase or receive more than five conch from Cayman waters in any one day.

WHELKS

- **Closed season:** 1 May through 31 October. No one may take whelk from Cayman waters during these months. No one may purchase, receive or possess whelk taken from Cayman waters during these months
- **Open season catch limit:** Two-and-a-half gallons in the shell or two-and-a-half pounds of processed whelks per person per day.
- No one may purchase or receive more than two-and-a-half gallons in the shell or two-and-a-half pounds processed whelks from Cayman waters in any one day.
- Chitons, periwinkles and bleeding teeth may not be taken from Cayman waters at any time.

ECHINODERMS

- Echinoderms (includes starfish, sea eggs/urchins, sea cucumber, sand dollars etc) may not be taken from Cayman waters at any time.

TURTLES

- No one may disturb, molest or take turtles in Cayman waters without a licence from the Marine Conservation Board.
- Possession of turtle eggs is prohibited.
- For licensed fishermen, closed season runs from 1 May through 31 October.

SHARKS

- No one may feed, attempt to feed or provide or use food to attract any shark in Cayman waters.

NASSAU GROUPERS

- **Designated Grouper Spawning Areas are protected.**
- **Closed season:** 1 January through 31 December 2003 and every alternate year thereafter (i.e. 2005,2007,2009 etc.).
- **Open season catch limit :** (2004, 2006, 2008 etc.) twelve grouper per person or per boat per day applies in these areas.
- During open season, only line fishing is permitted in these areas by Caymanians.
- **Size limit:** Twelve inch minimum size limit applies throughout Cayman waters year round.

OTHER FISH

- **Protected fish:** Jew fish, tilefish (whities), filefish (pipers) and angelfish, including Grey, French and Queen angels (old monks), may not be taken from Cayman waters at any time.
- **Size limit:** Eight-inch minimum size on all other fish except goggle eyes, herrings (including sprats), anchovies and silversides (including loggerhead and fine fry).

FISH POTS

- Must be licensed by the Marine Conservation Board
- Only Caymanians over 18 may be granted licences.
- Only two pots per family and pots must be identified with a DOE tag.
- No fish pot may be set within a one–mile radius of any Designated Grouper Spawning Area from 1 November through 31 March.

SPEAR GUNS & SEINE NETS

- No one may use a speargun (includes Hawaiian sling, polespear, harpoon, hookstick or any device with a pointed end which may be used to impale, stab or pierce any marine life but does not include a striker) or seine net without a licence from the Marine Conservation Board. NOTE: A striker is defined as a wooden pole, no shorter than 10 feet, with a maximum of 2 barb-less prongs attached to one end.
- No one may possess a speargun without a licence.
- No one may import a speargun or any parts for a speargun.
- Only Caymanians over 18 may be granted licences.
- **Speargun catch limit:** Three fish per licensed person per day.
- No one may possess more than six fish that have been caught by a speargun.
- No one may spearfish within a one–mile radius of any Designated Grouper Spawning Area from 1 November through 31 March.

FISHING LICENSES

- Unless licensed by the Marine Conservation Board, residents who do NOT possess Caymanian Status may not take or attempt to take, by any means, any marine life while he is on shore or in any part of Cayman waters in which he can stand.
- No licence is required for catch and release fishing.

GENERAL RULES

- Damaging coral by anchor, chains or any other means **ANYWHERE** in Cayman waters is prohibited.
- No taking of **ANY** marine life alive or dead while on SCUBA.
- No taking of any coral, sponges, etc. from Cayman waters.
- Wearing gloves while diving or snorkelling in Cayman waters is prohibited.
- Export of live fish or other marine life is prohibited.
- Fishing with gill nets, poison or other noxious substances is prohibited.
- Dumping **ANYTHING** in Cayman waters is prohibited.
- The export of conch shells and or black coral requires a CITES permit, issued through the DOE.

PENALTIES

Violation of any of these laws is an offence carrying a maximum penalty of CI\$500,000 fine and one year in jail. Upon conviction, forfeiture of the vessel or other equipment may also be ordered.

Call for further information
Department of Environment
580 North Sound Way, Grand Cayman.

Phone: 949-8469 Fax: 949-4020
Cayman Brac: 926-0136
Little Cayman: 926-0135
VHF: Channel 17

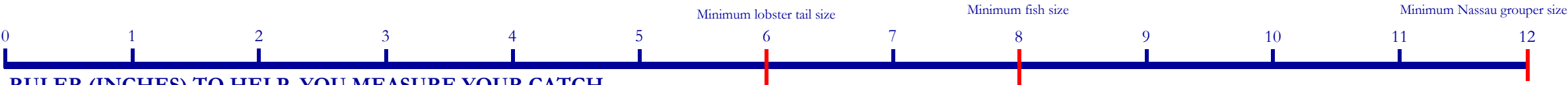
Report offences to VHF 17, 948-6002 or 911
Report oil spills or other marine
pollution to the DOE 949-8469 or 911
WEBSITE: www.gov.ky/doe
EMAIL: doe@gov.ky



Marine Park
Regulations
& Marine
Conservation
Laws
Cayman Islands



Department
of Environment



RULER (INCHES) TO HELP YOU MEASURE YOUR CATCH

CAYMAN ISLANDS



Supplement No.14 published with Gazette No. 17 dated
23 August, 2004.

THE ENDANGERED SPECIES (TRADE AND TRANSPORT) LAW, 2004

(LAW 14 OF 2004)

ARRANGEMENT OF SECTIONS

Part I- Preliminary

1. Short title.
2. Effect of this Law.
3. Interpretation.

Part II- Management and Scientific Authorities

4. Management Authority.
5. Scientific Authority.

Part III- Documents required for trade

6. Permits and certificates required.
7. Applications.
8. Import permits.
9. Export permits.
10. Re-export certificates.
11. Certificates of introduction from the sea.
12. Transport permit.
13. Conditions.
14. Registrable activities.
15. Scientific institutions.
16. Listing of commercially bred specimens and hybrids.
17. Marking of specimens.

Part V- Enforcement and Penalties

18. Powers of authorised officers.
19. Recovery of expenses.
20. Illegal trade.
21. Forgery etc. of permits or certificates.
22. Offences in connection with applications.
23. Restricted items.
24. Failure to register.
25. Forgery etc. of marks.
26. Offences by corporations.
27. Penalties.
28. Other sanctions.
29. Injunctions.

Part VI- General

30. Appeal against seizure.
31. Appeal against the Management Authority.
32. Financial provisions.
33. Duty to co-operate.
34. Resolutions of the Conference of the Parties.
35. Existing permits and certificates.
36. Amendments to Schedule.
37. Regulations.

38. Repeal and transitional arrangements.

SCHEDULE

CAYMAN ISLANDS

Law 14 of 2004.

I Assent

James M. Ryan

Acting Governor.

Date: 21st July, 2004

A LAW TO GIVE EFFECT TO THE PROVISIONS OF THE CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA ("CITES"); TO HELP CONSERVE WILD POPULATIONS OF ENDANGERED AND THREATENED SPECIES OF ANIMALS AND PLANTS BY CONTROLLING TRADE, TRANSPORT AND RELATED ACTIVITIES IN DESIGNATED SPECIES AND IN PRODUCTS DERIVED FROM THEM; AND FOR INCIDENTAL AND CONNECTED PURPOSES

ENACTED by the Legislature of the Cayman Islands

Part I - Preliminary

1. (1) This Law may be cited as the Endangered Species (Trade and Transport) Law, 2004. Short title

(2) This Law shall come into force on such date as may be appointed by order made by the Governor in Cabinet, and different dates may be appointed for different provisions of this Law and in relation to different matters.

2. This Law binds the Crown.

Effect of this Law

3. In this Law-

Interpretation

"artificially propagated", in sections 6(2)(d) and 16(b), refers only to live plants grown by humans from seeds, cuttings, divisions, callus tissues or other plant tissues, spores or other propagules under controlled conditions, where the cultivated parental stock -

- (a) was established to the satisfaction of the Management Authority in accordance with the provisions of the Convention and any relevant local laws;

- (b) was established in a manner not detrimental to the survival of the species in the wild; and
- (c) is managed in such a way as to be maintained indefinitely;

"authorised officer" means a constable, game warden, customs officer or any other person duly authorised by the Management Authority to enforce the provisions of this Law;

"bred in captivity", in sections 6(2)(d) and section 16(a), refers only to animals, including the eggs of animals, born or otherwise produced in a controlled environment either-

- (a) from parents that mated, or their gametes were otherwise transferred, in a controlled environment, if reproduction is sexual; or
- (b) from parents that were in a controlled environment when development of the offspring began, if reproduction is asexual;

and where, in either case, the parental breeding stock was established and is maintained to the satisfaction of the Management Authority so as to reliably produce second and subsequent generation offspring in compliance with the provisions of the Convention and any relevant local laws and in a manner not detrimental to the survival of the species in the wild;

"captive breeding facility" means a place or facility used for the captive breeding of animals;

"certificate" means a certificate granted by the Management Authority in accordance with this Law or, in the case of another country, granted in accordance with the Convention;

"commercial purpose" means any purpose with a commercial element, including all forms of trade other than a payment made exclusively for the transport of a specimen;

"controlled conditions" means a non-natural environment approved by the Management Authority that is intensively manipulated for the purpose of producing selected plant species or hybrids;

"controlled environment" means a facility approved by the Management Authority in which the environment is manipulated for the purpose of producing animals of a particular species and that has boundaries designed to prevent animals or their eggs or gametes from entering or leaving the facility;

"Convention" means the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington D.C., March 1973), including all Resolutions of the Conference of the Parties under the Convention;

"court" means the Grand Court;

"domestic trade" in relation to a specimen, means any activity within the Islands that is carried out for primarily commercial purposes, including acquisition, possession, use, display, hire, manufacture, transport, sale, purchase, barter and exchange and offering to sell, purchase, barter or exchange;

"endangered species" means species threatened with extinction;

"export" means to take a specimen out of the Islands;

"Governor in Cabinet" means the Governor acting in accordance with the advice of the Cabinet of the Islands;

"import" means to land a specimen on or to introduce a specimen into (other than to introduce from the sea) or to bring a specimen into any part of the Islands, or to attempt to do so, other than by way of transit or transshipment;

"international trade" means the import, export, re-export, transit or transshipment or the introduction from the sea of a specimen;

"introduce from the sea" means to land on or to introduce into the Islands or to bring into any part of the Islands, or to attempt to do so, a specimen that was taken from the marine environment not under the jurisdiction of any country, including the airspace above the sea and the subsoil and seabed beneath the sea;

"Management Authority" means-

- (a) the authority established under section 4;
- (b) in the case of another country, the management authority of that country for the purposes of the Convention; or,
- (c) in the case of a country not a party to the Convention, the governmental authority of that country recognised for the purposes of this Law by the Management Authority;

"mark" means any indelible imprint, lead, seal or other suitable means of identification affixed to a specimen by or at the direction of a management authority;

"normal range" means the area of the Islands in which a species listed in Part 2 of the Schedule naturally occurs;

"nursery" means a place or facility used for the artificial propagation of plants;

"permit" means a permit granted by the Management Authority in accordance with this Law or, in the case of another country, granted in accordance with the Convention;

"personal or household effect" means a dead specimen, other than a pre-Convention specimen, belonging to a private individual that forms or is intended to form part of his normal possessions and that is not used or intended to be used for any commercial purpose;

"pre-Convention specimen" means a specimen certified by a management authority that it was acquired before the provisions of the Convention applied to it;

"prescribed" means prescribed by regulations made by the Governor in Cabinet under this Law;

"re-export" means to export a specimen that has previously been imported;

"registrable activity" means an activity specified in section 14(1);

"rescue centre" means a rescue centre established or designated by the Management Authority pursuant to section 4(2)(f);

"restricted item" means an item specified in section 23(2);

"Scientific Authority" means the authority established under section 5 or, in the case of another country, the scientific authority of that country for the purposes of the Convention;

"species" means any species or sub-species of animal or plant or any geographically or genetically separate population thereof;

"specimen" means an animal or plant, whether live or dead, of a species listed in any Part of the Schedule and, unless specifically exempted from this Law by a provision to that effect in the Schedule, any part, derivative or hybrid of such a species;

"threatened species" means a species that, although not necessarily now threatened with extinction, may become so unless trade in specimens of that species is subject to strict regulation or that must be subject to regulation in order that trade in other species may be brought under effective control;

"tourist souvenir" means a dead specimen of a species listed in Column II of Parts 1 or 2 or Column IV of Part 2 of the Schedule that was acquired at a place or facility approved under section 14(4) by a visitor to the Islands and that is not used or intended to be used for any commercial purpose;

"trade" includes domestic and international trade;

"transit" or "transshipment" refers to -

- (a) a specimen in the course of shipment between two points outside the Islands to a named consignee whilst the specimen is in the customs control of the Islands and when any interruption in the movement of the specimen arises only from the requirements of customs procedures; and
- (b) in the case of commercial passenger ships, to a specimen which remains on board the ship at all times that the ship is within the territorial waters of the Islands;

"transport" refers to-

- (a) the conveyance of a specimen of a species listed in any Part of the Schedule between any two of the three islands of Grand Cayman, Cayman Brac and Little Cayman; and
- (b) in the case of species listed in Part 2 of the Schedule, to the conveyance of a live specimen within the Islands from a place within its normal range to a place outside its normal range; and

"vessel" includes any aircraft, hovercraft, ship, boat, lighter or other floating craft and all gear and equipment carried thereon.

Part II - Management and Scientific Authorities

4. (1) The Management Authority for the purposes of this Law and the Convention is the Permanent Secretary in the Ministry with responsibility for matters relating to the environment or such other person or persons as the Governor in Cabinet may from time to time designate. Management Authority

(2) The Management Authority is responsible, in consultation with the Scientific Authority, for the administration of this Law and for carrying out all related functions under the Convention and shall in particular -

- (a) process applications for permits and certificates having regard to the provisions of this Law and the Convention;
- (b) on the import of a specimen, cancel and retain the export permit or re-export certificate and any corresponding import permit presented in respect of the import of that specimen;
- (c) maintain a register of persons engaged in registrable activities;
- (d) maintain a register of scientific institutions within the Islands pursuant to section 15;
- (e) maintain records of trade in specimens as required by the Convention and compile and submit periodic reports on such trade and on the legislative, regulatory and administrative measures taken to enforce the provisions of this Law and the Convention as may in either case be required by the Convention or by the Governor in Cabinet;
- (f) establish or designate one or more rescue centres for the care of seized or forfeited live specimens under this Law and establish procedures for the disposal of specimens;
- (g) prepare and maintain pursuant to section 34 a register of Resolutions of the Conference of the Parties to the Convention;
- (h) publicise the provisions of this Law and the Convention, including the periodic reports under paragraph (e), in order to foster public understanding of and to encourage compliance with them;
- (i) co-operate with other local and international authorities on the implementation and enforcement of the provisions of this Law and the Convention;
- (j) advise the Governor in Cabinet on measures to be taken to implement and enforce the provisions of this Law and the Convention; and
- (k) carry out such other functions as may be required under the provisions of the Convention or ordered by the Governor in Cabinet.

(3) Any changes to the Management Authority made pursuant to subsection (1) shall be published by notice in the Gazette.

Scientific Authority

5. (1) The Scientific Authority for the purposes of this Law and the Convention is a committee comprising-

- (a) the Director of the Department of the Environment;
- (b) the Chief Agricultural and Veterinary Officer; and
- (c) three persons with relevant scientific or technical knowledge appointed by the Governor in Cabinet.

(2) The Director of the Department of the Environment is the chairman of the Authority.

(3) Members of the Authority appointed under subsection (1)(c) shall hold office for a term of two years and shall be eligible for re-appointment.

(4) The Authority shall appoint a person, not being a member, to be the secretary of the Authority who shall be present at all meetings and shall take minutes of the business transacted.

(5) There shall be paid to the members appointed under subsection (1) (c) such remuneration as the Governor in Cabinet may determine.

(6) Three members of the Authority constitute a quorum.

(7) The Authority may delegate any of its powers or duties to a sub-committee of its members or to any particular member.

(8) Subject to the provisions of this Law, the Authority may regulate its own procedure.

(9) The Scientific Authority is responsible for advising the Management Authority on any matters relating to the implementation or enforcement of the provisions of this Law or the Convention as the Scientific Authority considers relevant and shall in particular—

- (a) advise the Management Authority on applications for permits or certificates having regard to the relevant considerations set out in Part III;
- (b) monitor the grant of export permits and certificates of introduction from the sea, together with the actual export and introduction of specimens;
- (c) advise the Management Authority whenever it considers that –
 - (i) any measures should be taken to limit the grant of export permits or certificates of introduction from the sea on conservation grounds and, in the case of species listed in Part 2 of the Schedule; and
 - (ii) the export or introduction from the sea of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecological systems in which it occurs and above the level at which that species may become threatened with extinction in any part of its range or for any other reason;

- (d) advise the Management Authority on the disposal of seized or forfeited specimens and the establishment and designation of rescue centres;
- (e) advise the Management Authority on the registration of scientific institutions and of persons engaged in registrable activities;
- (f) monitor the species listed in the Schedule and advise the Management Authority when it considers that it is necessary for any species to be added to or deleted from any Part, whether as a result of amendments to the Appendices to the Convention or for any other reason;
- (g) prepare and maintain plans delineating the normal range within the Islands of species listed in Part 2 of the Schedule; and
- (h) carry out such other functions as may be required under the Convention or determined by the Governor in Cabinet.

(10) In carrying out its functions under this Law, the Scientific Authority may, and shall if so required by the Management Authority, consult other local, regional or international scientific bodies.

(11) The Scientific Authority may from time to time, and shall if so required by the Governor in Cabinet, publish reports relating to the performance of any of its functions under this Law.

Part III - Documents Required for Trade

Permits and certificates
required

6. (1) The following permits and certificates are, subject to subsections (2), (3) and (4), required under this Law -
- (a) for the import of a specimen of a species listed in Column I of Part 1 of the Schedule, the prior presentation of an import permit granted by the Management Authority and an export permit or a re-export certificate granted by the country of export or re-export of the specimen;
 - (b) for the import of a specimen of a species listed in Column II of Part 1 of the Schedule, the prior presentation of an export permit or a re-export certificate granted by the country of export or re-export of the specimen;
 - (c) for the import of a specimen of a species listed in Column III of Part 1 of the Schedule, the prior presentation of a certificate of origin granted by the country of origin and, where the import is from a country which has included that species in Appendix III to the Convention, an export permit from that country;

- (d) for the export of a specimen of a species listed in Column I or II of Part 1, or Part 2 of the Schedule, the prior presentation of an export permit granted by the Management Authority;
 - (e) for the re-export of a specimen of a species listed in Column I or II of Part 1 of the Schedule, the prior presentation of a re-export certificate granted by the Management Authority;
 - (f) for the re-export of a specimen of a species listed in Column III of Part 1 of the Schedule, the prior presentation of a certificate granted by the Management Authority that the specimen was processed in the Islands or is being re-exported without having been processed;
 - (g) for the introduction from the sea of a specimen of a species listed in Column I or II of Part I or Part 2 of the Schedule, the prior presentation of a certificate of introduction from the sea granted by the Management Authority;
 - (h) for the transit or transshipment of a specimen of a species listed in Column I or II of Part 1 the Schedule, the prior presentation of an export permit or a re-export certificate granted by the country of origin of the shipment and, if applicable, an import permit granted by the country of destination; and
 - (i) for the transport of a specimen, the prior presentation of a transport certificate granted by the Management Authority.
- (2) A person does not require a permit or certificate under subsection (1) for the import, export, re-export or transit or transshipment of -
- (a) a personal or household effect other than -
 - (i) a specimen of a species listed in Column I of Part I of the Schedule that was acquired by the owner outside his country of usual residence and is being imported into that country; or
 - (ii) a specimen of a species listed in Column II of Part 1 of the Schedule-
 - (A) that was acquired by the owner outside his country of usual residence;
 - (B) that is being imported into that country; and
 - (C) the country in which the specimen was removed from the wild, not being the owner's usual country of residence and which requires the prior grant of export permits for the export of personal or household effects;
 - (b) a live or dead plant specimen or other preserved, dried or embedded museum specimen, which carries a label approved by a management authority and which is the subject of a non-commercial loan, donation or exchange between scientific

institutions registered by the management authorities of their countries;

- (c) a pre-Convention specimen; or
- (d) a specimen certified in accordance with the Convention by the management authority of the country of export that it was bred in captivity, if an animal, or artificially propagated, if a plant, or that it is part of such an animal or plant.

(3) A person does not require an export or re-export permit under subsections 6 (1)(d) or 6 (1)(e) for the export or re-export of a tourist souvenir.

(4) A person does not require an export permit or re-export certificate for the import or re-export of a specimen of a marine species listed in Column II of Part I of the Schedule that has been certified by the management authority of the country of export as having been taken by a ship registered in that country in accordance with the provisions of an international treaty, convention or agreement that was in force in that country at the time of the coming into force of the Convention.

(5) Applications in the Islands for certificates pursuant to subsections (2)(c), (2)(d) or (4) shall be made to the Management Authority, and the applicant shall provide to the Authority such information in connection with the application as the Authority may require and pay such fees as may be prescribed.

(6) The decisions of the Management Authority on applications under subsection (5) shall be final.

Applications

7. (1) An application for a permit or a certificate under section 6(1) shall be made to the Management Authority in accordance with this Law.

(2) The applicant shall submit such information in connection with the application as the Management Authority may require and shall pay the prescribed application fee.

(3) Unless the Management Authority otherwise directs, a separate application is required for each specimen in a consignment.

(4) The Management Authority may, having regard to the provisions of this Law and the Convention and to any other material considerations, refuse an application or grant it in accordance with this Part.

Import permits

8. The Management Authority may grant an import permit only if it is satisfied that the following conditions are met -

- (a) that the Scientific Authority considers that the import will be for purposes which are not detrimental to the survival of any species listed in Parts 1 or 2 of the Schedule in any part of its range and that there are no other material conservation objections to the import of the specimen;
- (b) in the case of a specimen of a species listed in Column I of Part 1 of the Schedule, that the specimen will not be used for primarily commercial purposes;
- (c) in the case of a live specimen, that the proposed recipient is equipped to house and care for it suitably; and
- (d) that the specimen has not been obtained in contravention of any law, including any international treaty or convention or foreign law.

9. The Management Authority may grant an export permit only if it is satisfied that the following conditions are met - Export permits

- (a) in the case of a specimen of a species listed in Column I or II of Part 1 or in Part 2 of the Schedule, that the Scientific Authority considers that the export will not be detrimental to the survival of the species in any part of its range, that it will not reduce the population of a species listed in Column II of Part 1 or Columns II, III or IV of Part 2 of the Schedule to the level that it might be eligible for inclusion in Column I of Part 1 of the Schedule, and that there are no other material conservation objections to the export of the specimen;
- (b) in the case of a specimen of a species listed in Column I of Part 1 of the Schedule, that an import permit for that specimen has been granted by the management authority of the country of destination in accordance with the Convention;
- (c) that the export will not exceed any annual or other quota for the export of specimens of that species that the Management Authority may have adopted;
- (d) in the case of a live specimen, that it will be prepared and shipped so as to minimise the risk of injury, damage to health or cruel treatment; and
- (e) that the specimen was not obtained in contravention of any law, including any international treaty or convention or foreign law.

10. The Management Authority may grant a re-export certificate only if it is satisfied that the following conditions are met - Re-export certificates

- (a) that the specimen was imported in accordance with the provisions of this Law and the Convention;
- (b) that the Scientific Authority considers that the re-export will not be detrimental to the survival of any species listed in Parts 1 or 2

- of the Schedule in any part of its range and that there are no other material conservation objections to the re-export of the specimen;
- (c) in the case of a live specimen, that it will be so prepared and shipped as to minimise the risk of injury, damage to health or cruel treatment; and
- (d) in the case of a live specimen of a species listed in Column I of Part 1 of the Schedule, that an import permit has been granted by the management authority of the country of destination.

Certificates of
introduction from the
sea

11. (1) The Management Authority may grant a certificate of introduction from the sea only if it is satisfied that the following conditions are met -

- (a) that the Scientific Authority considers that the introduction from the sea will not be detrimental to the survival of any species listed in Parts 1 or 2 of the Schedule in any part of its range and that there are no other material conservation objections to the introduction of the specimen;
- (b) in the case of a specimen of a species listed in Column I of Part 1 of the Schedule, that the specimen will not be used for primarily commercial purposes;
- (c) that the introduction will not exceed any annual or other quota for the introduction from the sea of specimens of that species that the Management Authority may have adopted;
- (d) in the case of a live specimen, that the proposed recipient is equipped to house and care for it suitably and that it will be handled so as to minimise the risk of injury, damage to health or cruel treatment; and
- (e) that the specimen has not been obtained in contravention of any law, including any international treaty or convention or foreign law.

(2) A certificate under subsection (1) may, on the advice of the Scientific Authority, specify a total number of specimens that may be introduced from the sea pursuant to the certificate during such period not exceeding the period of validity of the certificate as is stated in the certificate.

Transport certificate

12. (1) The Management Authority may grant a transport certificate only if it is satisfied that the following conditions are met—

- (a) that the Scientific Authority considers that the transport of the specimen will not be detrimental to the survival of any species listed in Column I or II of Part 1 or in Part 2 of the Schedule in any part of its range and that there are no other material conservation objections to the transport of the specimen;

- (b) in the case of a species listed in Column I of Part 1 of the Schedule, that the specimen will not be used for primarily commercial purposes;
- (c) in the case of a live specimen, that the proposed recipient is equipped to house and care for it suitably and that it will be handled so as to minimise the risk of injury, damage to health or cruel treatment; and
- (d) that the specimen has not been obtained in contravention of any law, including any international treaty or convention or foreign law.

(2) A transport certificate is not required for the import, export, re-export or introduction from the sea of a specimen.

13. A permit or a certificate granted under this Law—

Conditions

- (a) may be general or specific;
- (b) may be granted to any person or class of persons;
- (c) may not be transferred to or used by or on behalf of a person other than the person or class of person named or identified on the permit or certificate;
- (d) may be subject to compliance with any specified conditions;
- (e) may, in exceptional circumstances, be granted retrospectively in accordance with any relevant provisions of the Convention in respect of species listed in Column II or III of Part 1 or in Part 2 or Part 3 of the Schedule provided any irregularities are not attributable to the importer, exporter, re-exporter, introducer from the sea or transporter;
- (f) may be modified or revoked at any time by the Management Authority; and
- (g) subject to paragraph (f), shall be valid for such period as is stated in the permit or certificate, which shall not, otherwise than as may be permitted by the Convention, exceed 6 months in the case of export permits and re-export certificates or 12 months in the case of import permits, certificates of introduction from the sea and transport certificates.

Part IV - Registration

14. (1) Any person who-

Registrable activities

- (a) engages in the domestic trade of specimens of any species listed in any Part of the Schedule;
- (b) engages in the captive breeding of animals of any species listed in any Part of the Schedule; or

- (c) engages in the artificial propagation of plants of any species listed in any Part of the Schedule,

shall be registered under this Law.

(2) Applications for certificates of registration pursuant to subsection (1) shall be made to the Management Authority in accordance with this Law.

(3) The applicant shall submit such information in connection with the application as the Management Authority may require and pay such fee for the making of the application as may be prescribed by the Governor in Cabinet.

(4) Registration shall be at the discretion of the Management Authority and, if granted-

- (a) shall specify the place or facility approved by the Management Authority at which the activities authorised by the registration may be carried out; and
- (b) shall be subject to a condition that the applicant keeps records of his stock and transactions in a form approved by the Management Authority and to such other conditions, including conditions regulating the number, scope or nature of the activities, as the Management Authority may impose or as may be required under this Law.

(5) A place or facility shall not be approved by the Management Authority pursuant to subsection (4) unless the place or facility complies in all respects with the provisions of this Law and the Convention and in particular—

- (a) a captive breeding facility shall not be approved unless the animals are born or otherwise produced in a controlled environment and the parental breeding stock was established and is maintained so as to reliably produce second and subsequent generation offspring in a manner not detrimental to the survival of the species in the wild; and
- (b) a nursery shall not be approved unless the plants are grown under controlled conditions and the cultivated parental stock was established in a manner not detrimental to the survival of the species in the wild and in such a way as to maintain the cultivated stock indefinitely.

(6) Where the Management Authority is of the opinion that any of the conditions imposed pursuant to subsection (4) are not being observed or have not been observed, the Management Authority may revoke the registration at any time.

15. (1) The Management Authority shall keep and maintain a register of scientific institutions for the purposes of section 6 (2) (b) and a scientific institution which wishes to register under this Law for such purposes shall apply to the Management Authority.

Scientific institutions

(2) The applicant shall submit such information in connection with the application as the Management Authority may require and pay such fee for the making of the application as may be prescribed by the Governor in Cabinet.

(3) Registration shall be at the discretion of the Management Authority and shall be subject to such conditions as the Management Authority may specify.

(4) Registration under this section may be revoked by the Management Authority at any time for good cause.

16. For the purposes of this Law—

Listing of commercially
bred specimens and
hybrids

- (a) specimens of animal species listed in Column I of Part 1 of the Schedule that have been bred in captivity for commercial purposes shall be deemed to be specimens of species listed in Column II of Part 1 of the Schedule;
- (b) specimens of plant species listed in Column I of Part 1 of the Schedule that have been artificially propagated for commercial purposes shall be deemed to be specimens of species listed in Column II of Part 1 of the Schedule;
- (c) a hybrid of a species listed in Column I of Part 1 of the Schedule and any other species shall be deemed to be a specimen of a species listed in Column I Part I; and
- (d) a hybrid of a species listed in Column II of Part 1 of the Schedule and a species other than one listed in Column I of Part 1 shall be deemed to be a specimen of a species in Column II of Part 1.

17. (1) The Management Authority may, whenever it considers it appropriate to do so, affix or cause to be affixed a mark to a specimen to assist in identifying the specimen.

Marking of specimens

(2) A specimen of an animal species listed in Column I or II of Part 1, or in Part 2 or Part 3 of the Schedule that has been bred in captivity may not be traded or transported unless it has been uniquely and permanently marked in a manner approved by the Management Authority.

Part V - Enforcement and Penalties

Powers of authorised
officers

18. (1) An authorised officer may-

- (a) interrogate any person found in possession of or having control of a specimen or any person engaged in a registrable activity;
- (b) require to be produced and examine and take copies of any records or documents apparently relating to a specimen or to a registrable activity or of any permit, certificate or other document required under the provisions of this Law or the Convention;
- (c) whenever he reasonably suspects any person of having contravened any provision of this Law or the Convention, search that person and his property and anything in his possession or under his control;
- (d) at any reasonable time and (if required to do so) upon producing evidence that he is so authorised, enter any land or premises where a specimen is or is reasonably believed to be kept or where a registrable activity is or is reasonably believed to be carried out; and
- (e) seize any specimen in respect of which he reasonably suspects there has been an offence under this Law or a violation of the Convention and any records or documents relating to that specimen.

(2) Where an authorised officer is satisfied that there is reasonable evidence of an offence under this Law, he may arrest and detain any person suspected of the offence and seize any vessel or vehicle and any cage, container or other article or equipment used in its commission.

(3) Anything seized under subsection (1)(e) or (2) shall, subject to any decision of the Court under section 27 or 28 or to the results of any appeal under section 30, become the property of the Crown and shall, subject to subsection (4), be disposed of in such manner as the Management Authority may direct.

(4) The owner of a vessel or vehicle forfeited pursuant to this section shall have the right to recover ownership of it on payment to the Crown of such sum, not exceeding its market value, as the Governor in Cabinet may specify.

(5) Any person who assaults, obstructs, intimidates or gives false information to an authorised officer acting under this section shall be guilty of an offence.

Recovery of expenses

19. Where, in the case of a live specimen which is seized or forfeited under this Law, the Management Authority incurs any expenses in connection with—

- (a) the live's specimen return to the wild;

- (b) its being kept at premises (whether within or outside the Islands) which are suitable for the keeping of the specimen; or
- (c) its disposal,

those expenses may be recovered, as a civil debt due to the Crown, from the importer or intending exporter of the specimen or from any person possessing or having control of it at the time of seizure.

20. A person who imports, exports, re-exports, transits or transships, introduces from the sea or transports any specimen without a valid permit or certificate or in contravention of a condition attached to a permit or certificate commits an offence. Illegal trade

21. A person who forges a permit or a certificate or who, without being so authorised by the Management Authority, alters, defaces or modifies a permit or certificate in any way commits an offence and the permit or certificate concerned shall be void. Forgery etc. of permits or certificates

22. (1) A person who for the purpose of obtaining, whether for himself or another, the grant of a permit or a certificate— Offences in connection with applications

- (a) makes a statement which he knows to be false or misleading in a material particular;
- (b) furnishes a document or information which he knows to be false or misleading in a material particular;
- (c) recklessly makes a statement or representation which is false or misleading in a material particular; or
- (d) recklessly furnishes a document or information which is false or misleading in a material particular,

commits an offence.

(2) Where a permit or a certificate has been granted under this Law and, for the purpose of obtaining its grant, a person commits an offence under subsection (1), the permit or certificate shall be void.

23. (1) Subject to subsection (3), a person who has a restricted item in his possession or control or who engages in any activity with a commercial purpose with respect to a restricted item commits an offence. Restricted items

(2) A restricted item for the purposes of subsection (1) is -

- (a) a specimen that has been imported on or after 14th September 1978 contrary to the provisions of this Law;

- (b) a specimen that has been transported contrary to the provisions of this Law; or
- (c) anything that derives from or is made wholly or partly from a specimen referred to in paragraph (a) or (b).

(3) A person shall not be guilty of an offence under subsection (1) with respect to a restricted item if he proves to the satisfaction of the Court—

- (a) that at the time when it first came into his possession, he made such enquiries (if any) as in the circumstances were reasonable in order to ascertain whether it was a restricted item; and
- (b) that, at the time the alleged offence was committed, he had no reason to believe that it was a restricted item.

(4) Without prejudice to the generality of subsection (3), a person (the accused) shall be taken to have made such enquiries as are there mentioned if he produces to the Court a written statement that was furnished by the person from whom the accused obtained possession of the restricted item (the supplier), that was signed by the supplier or by a person authorised by him, and which states that—

- (a) the supplier made enquiries at the time the restricted item came into his possession in order to ascertain whether it was a restricted article, and
- (b) the supplier had no reason to believe at the time he relinquished possession of the restricted item to the accused that the article was at that time a restricted item.

(5) A person who furnishes for the purposes of subsection (4) a written statement that he knows to be false in a material particular, or recklessly furnishes for those purposes a certificate that is false in a material particular, commits an offence.

Failure to register

24. A person who engages in a registrable activity without being registered under section 14 commits an offence.

Forgery etc. of marks

25. A person who forges a mark or who, without the prior consent of the Management Authority, alters, defaces or erases a mark affixed to a specimen commits an offence.

Offences by corporations

26. Where an offence under this Law is committed by a body corporate, every person who at the time of the commission of the offence was a director, manager, secretary or other similar officer of the body corporate, or was purporting to act in any such capacity, shall be deemed to have committed that offence unless he proves that the offence was committed without his consent or connivance and that he exercised all such diligence to prevent the commission of the offence as he

ought to have exercised having regard to the nature of his functions in that capacity and to all other circumstances.

27. (1) A person guilty of an offence under this Law shall be liable to a fine of \$500,000 or to imprisonment for a term of 4 years or to both and any specimen in respect of which the offence was committed shall be forfeited to the Crown. Penalties

(2) If a person prosecuted for an offence under this Law is acquitted, the Court may nonetheless order any specimen concerned to be forfeited to the Crown.

(3) A specimen forfeited under this section shall be disposed of in such manner as the Management Authority may direct.

28. (1) Where a person has been convicted of an offence under this Law, the Court may, having regard to the nature of the offence and the circumstances surrounding its commission and in addition to any other punishment that may be imposed, make an order, having any or all of the following effects- Other sanctions

- (a) prohibiting the person from holding any permit or certificate under this Law either permanently or for such period as the Court may determine;
- (b) prohibiting the person from doing any act or engaging in any activity that may result in the continuation of the offence or its repetition;
- (c) forfeiting to the Crown any cage, container, vessel, vehicle or other item or equipment used in the commission of the offence;
- (d) directing the person to compensate the Management Authority for the costs of caring for or disposing of any specimens seized or forfeited in connection with the offence;
- (e) directing the person to compensate the Management Authority for the costs of any remedial or preventative action taken or proposed to be taken by or on behalf of the Management Authority as a result of the act that constituted the offence; and
- (f) directing the person to post such bond or pay such amount of money into Court as will ensure compliance with any order made pursuant to this section.

(2) In any order under subsection (1) forfeiting a vessel or a vehicle, the Court may, in the order, specify a sum, not exceeding the market value of the vessel or vehicle, on the payment of which to the Crown the owner may recover ownership of the vessel or vehicle.

(3) Anything forfeited under this section may, subject to subsection (2), be disposed of in such manner as the Management Authority may direct.

Injunctions

29. (1) Where, on the application of the Management Authority, it appears to the Court that a person has done, or is about to do, or is likely to do, any act constituted or directed towards the commission of an offence under this Law, the Court may issue an injunction ordering any person named in the application-

- (a) to refrain from doing any act that appears to the Court may constitute or be directed towards the commission of an offence under this Law; or
- (b) to do any act that appears to the Court may prevent the commission of an offence under this Law.

(2) No injunction shall issue under subsection (1) unless 48 hours notice is given to the person named in the application or the urgency of the situation is such that the service of notice would not be in the public interest.

Part VI - General

Appeal against seizure

30. (1) Any person aggrieved by the seizure of a specimen or other item by an authorised officer under this Law may, within 10 days of the date of the seizure, appeal against it to the Management Authority by serving on the Authority notice in writing of the intention to appeal and the grounds thereof.

(2) The Management Authority may defer the hearing of an appeal pending the outcome of any criminal proceedings that may be brought in respect of the incident giving rise to the seizure.

(3) On the hearing of an appeal, the Management Authority may confirm or reverse the action of the officer and shall give written reasons for its decision to the appellant.

(4) Any person aggrieved by a decision of the Authority under subsection (3) may, within 14 days of the date on which the written reasons for the decision were given, appeal against the decision on a point of law only to the court.

Appeal against the
Management Authority

31. (1) Any person aggrieved by a decision of the Management Authority-

- (a) refusing an application for a permit or a certificate under section 7(4);
- (b) imposing a condition on a permit or a certificate under section 13(d);
- (c) modifying or revoking a permit or a certificate under section 13(f);

- (d) refusing an application for registration under section 14 or 15;
- (e) imposing a condition on registration under section 14(4); or
- (f) revoking a registration under section 14(6) or 15(4),

may, within 10 days of the day on which the decision is given, appeal against it to the Governor in Cabinet by serving on the Governor in Cabinet and the Authority notice in writing of the intention to appeal and the grounds thereof.

(2) On the hearing of an appeal, the Governor in Cabinet may, having regard to the provisions of this Law and the Convention, confirm, reverse or vary the decision appealed against as appropriate or exercise any other power that the Management Authority could have exercised under this Law and the Governor in Cabinet shall give written reasons for his decision to the appellant.

(3) Any person aggrieved by a decision of the Governor in Cabinet under subsection (2) may, within 14 days of the date on which the written reasons for the decision were given, appeal against the decision on a point of law only to the Grand Court.

32. (1) The costs of the administration and enforcement of this Law shall be a charge on the revenue of the Islands. Financial provisions

(2) The Government shall establish a special fund to be used for the administration and enforcement of this Law, including the establishment or designation of rescue centres, and any fees charged under this Law shall be paid into the fund.

33. It shall be the duty of all government departments, agencies and statutory authorities to co-operate with the Management Authority in enforcing the provisions of this Law. Duty to co-operate

34. (1) The Management Authority shall keep and maintain a register of the texts of all the Resolutions of the Conference of the Parties to the Convention as are in force for the time being. Resolutions of the Conference of the Parties

(2) The register shall be available for public inspection at all reasonable times.

35. Without prejudice to section 25(2) of the Interpretation Law (1995 Revision), any permit or certificate granted under the Endangered Species Protection and Propagation Law (1999 Revision) that is in force immediately before the commencement of this Law - Existing permits and certificates

- (a) shall have effect as from the commencement of this Law as if granted under this Law; and
- (b) in the case of a permit or certificate for a specified period, shall remain in force, subject to the provisions of this Law, for so much of that period as falls after the commencement of this Law.

Amendments to
Schedule

36. (1) Subject to subsection (2), the Management Authority may, on the advice of the Scientific Authority, and shall, whenever required under the Convention, make by order such changes to any Part of the Schedule as may be desirable for any of the following purposes—

- (a) in the case of Column I of Part 1, to give effect to any amendment made in accordance with the provisions of the Convention to the list of species included in Appendix I to the Convention (species threatened with extinction which are or may be affected by trade);
- (b) in the case of Column II of Part 1, to give effect to any amendment made in accordance with the provisions of the Convention to the list of species included in Appendix II to the Convention (species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation and other species which must be subject to regulation in order that trade in specimens of other Appendix II species may be brought under effective control);
- (c) in the case of Column III of Part 1, to give effect to any amendment made in accordance with the provisions of the Convention to the list of species included in Appendix III to the Convention (species which any Party to the Convention identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and as needing the co-operation of other Parties in the control of trade);
- (d) in the case of Part 2—
 - (i) to list all the species listed in Appendix I, II or III to the Convention that are indigenous to or occur naturally in the Islands; and
 - (ii) to list all other species that are indigenous to or occur naturally in the Islands and that are considered by the Scientific Authority to have populations in the Islands which would be at risk from unregulated trade;
- (e) in the case of Part 3, to list all species that are considered by the Scientific Authority to require strict regulation of their trade under this Law because of their potential threat to the survival, health, genetic integrity or viability of populations of any other species indigenous to or occurring naturally in the Islands;

- (f) to remove any restriction that is for the time being imposed by virtue of this Law on the trade of any species or any particular part or derivative thereof and that does not appear to promote the conservation of the species;
- (g) to facilitate the more effective or more convenient administration of any restriction that is for the time being imposed by virtue of this Law on the trade of any species or any particular part or derivative thereof;
- (h) to promote the conservation in the Islands of animals or plants of any species; and
- (i) to give effect to any amendment to the Convention.

(2) No orders shall be made under this section which are contrary to or inconsistent with any provision of the Convention.

37. The Governor in Cabinet may make regulations—

Regulations

- (a) prescribing fees to be charged for the making of applications or the issuing of permits and certificates;
- (b) prescribing forms of applications, permits and certificates;
- (c) prescribing the conditions required to be met and the fees to be charged for registration under sections 14 and 15;
- (d) prescribing rules for appeals under sections 30 and 31;
- (e) designating one or more ports of exit, to which all exports and re-exports of specimens shall be restricted, and one or more ports of entry, to which all imports, shipments in transit or transshipment and introductions from the sea shall be restricted;
- (f) increasing the penalties in section 27; or
- (g) for such other matters as may be necessary for the implementation of this Law and the Convention.

38. (1) The Endangered Species Protection and Propagation Law, (1999 Revision) is repealed.

Repeal and transitional
arrangements

(2) Until regulations are made under this Law to provide for a matter that may be prescribed by regulations, any regulations under the Endangered Species Protection and Propagation Law, (1999 Revision) relating to that matter and in force immediately before the coming into force of this section shall apply as if made under this Law.

SCHEDULE

PART I

Column I: All endangered species listed in Appendix I to the Convention.

Column II: All threatened species listed in Appendix II to the Convention.

Column III: All species listed in Appendix III to the Convention

PART 2

Column I: Species which are indigenous to or occur naturally in the Islands and are listed in Appendix I to the Convention.

Column II: Species which are indigenous to or occur naturally in the Islands and are listed in Appendix II to the Convention.

Column III: Species which are indigenous to or occur naturally in the Islands and are listed in Appendix III to the Convention.

Column IV: Other species which are indigenous to or occur naturally in the Islands and which are considered by the Scientific Authority to have populations in the Islands which would be at risk from unregulated trade.

PART 3

Species which are considered by the Scientific Authority to require strict regulation of their trade because of their potential threat to the survival, health, genetic integrity or viability of populations of any other species indigenous to or occurring naturally in the Islands.

NOTES TO THE SCHEDULE

1. Species included in these Schedules are referred to:
 - (a) by the name of the species; or
 - (b) as being all of the species included in a higher taxon or designated part thereof.
2. The abbreviation "spp." is used to denote all species of a higher taxon.

3. Other references to taxa higher than species are for the purposes of information or classification only. The common names included after the scientific names of families are for reference only. They are intended to indicate the species within the family concerned that are included in the Schedules. In most cases this is not all of the species within the family.
4. The following abbreviations are used for plant taxa below the level of species:
 - (a) "ssp." is used to denote subspecies; and
 - (b) "var(s)." is used to denote variety (varieties).
5. As none of the species or higher taxa of FLORA included in Column I of Part I is annotated to the effect that its hybrids shall be treated in accordance with the provisions of Article III of the Convention, this means that artificially propagated hybrids produced from one or more of these species or taxa may be traded with a certificate of artificial propagation, and that seeds and pollen (including pollinia), cut flowers, seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers of these hybrids are not subject to the provisions of the Convention.
6. The names of the countries in parentheses placed against the names of species in Column III of Part I are those of the Parties submitting these species for inclusion in Part III to the Convention.
7. In accordance with Article I, paragraph (b), sub-paragraph (iii), of the Convention, the symbol (#) followed by a number placed against the name of a species or higher taxon included in Column II or III of Part I designates parts or derivatives which are specified in relation thereto for the purposes of the Convention as follows:
 - #1 Designates all parts and derivatives, except:
 - a) seeds, spores and pollen (including pollinia);
 - b) seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers; and
 - c) cut flowers of artificially propagated plants.
 - #2 Designates all parts and derivatives, except:
 - a) seeds and pollen;
 - b) seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers;
 - c) cut flowers of artificially propagated plants; and
 - d) chemical derivatives and finished pharmaceutical products.
 - #3 Designates whole and sliced roots and parts of roots, excluding manufactured parts or derivatives such as powders, pills, extracts, tonics, teas and confectionery.

- #4 Designates all parts and derivatives, except:
- a) seeds, except those from Mexican cacti originating in Mexico, and pollen;
 - b) seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers;
 - c) cut flowers of artificially propagated plants;
 - d) fruits and parts and derivatives thereof of naturalized or artificially propagated plants; and
 - e) separate stem joints (pads) and parts and derivatives thereof of naturalized or artificially propagated plants of the genus *Opuntia* subgenus *Opuntia*.
- #5 Designates logs, sawn wood and veneer sheets.
- #6 Designates logs, sawn wood, veneer sheets and plywood.
- #7 Designates logs, wood-chips and unprocessed broken material.
- #8 Designates all parts and derivatives, except:
- (a) seeds and pollen (including pollinia);
 - (b) seedling or tissue cultures obtained *in vitro*, in solid or liquid media, transported in sterile containers;
 - (c) cut flowers of artificially propagated plants; and fruits and parts and derivatives thereof of artificially propagated plants of the genus *Vanilla*.

PART I

Columns		
I	II	III
FAUNA (ANIMALS) PHYLUM CHORDATA CLASS MAMMALIA (MAMMALS)		
MONOTREMATA		
Tachyglossidae Echidnas, spiny anteaters		

	Zaglossus spp.	
DASYUROMORPHIA		
Dasyuridae Dunnarts		
<i>Sminthopsis longicaudata</i> <i>Sminthopsis psammophila</i>		
Thylacinidae Tasmanian wolf, thylacine		
<i>Thylacinus cynocephalus</i> (possibly extinct)		
PERAMELEMORPHIA		
Peramelidae Bandicoots		
<i>Chaeropus ecaudatus</i> (possibly extinct) <i>Macrotis lagotis</i> <i>Macrotis leucura</i> <i>Perameles bougainville</i>		
DIPROTODONTIA		
Phalangeridae Cuscuses		
	<i>Phalanger orientalis</i> <i>Spilocuscus maculatus</i>	
Vombatidae Northern hairy-nosed wombat		
<i>Lasiorninus kreffti</i>		
Macropodidae Kangaroos, wallabies		
<i>Lagorchestes hirsutus</i> <i>Lagostrophus fasciatus</i> <i>Onychogalea fraenata</i> <i>Onychogalea lunata</i>	<i>Dendrolagus inustus</i> <i>Dendrolagus ursinus</i>	
Potoroidae Rat-kangaroos		
<i>Bettongia</i> spp. <i>Caloprymnus campestris</i> (possibly extinct)		
SCANDENTIA		
Tupaïidae Tree shrews		
	Tupaïidae spp.	
CHIROPTERA		
Phyllostomidae Broad- nosed bat		
		<i>Platyrrhinus lineatus</i> (Uruguay)
Pteropodidae Fruit bats,		

flying foxes <i>Acerodon jubatus</i> <i>Acerodon lucifer</i> (possibly extinct) <i>Pteropus insularis</i> <i>Pteropus mariannus</i> <i>Pteropus molossinus</i> <i>Pteropus phaeocephalus</i> <i>Pteropus pilosus</i> <i>Pteropus samoensis</i> <i>Pteropus tonganus</i>	<i>Acerodon</i> spp. (Except the species included in Column I of Part 1) <i>Pteropus</i> spp. (Except the species included in Column I of Part 1)	
PRIMATES Apes, monkeys	PRIMATES spp. (Except the species included in Column I of Part 1)	
Lemuridae Large lemurs		
Lemuridae spp.		
Megaladapidae Sportive lemurs		
Megaladapidae spp. (possibly extinct)		
Cheirogaleidae Dwarf lemurs		
Cheirogaleidae spp.		
Indridae Avahi, indris, sifakas, woolly lemurs		
Indridae spp.		
Daubentoniidae Aye-aye		
Daubentonia Madagascariensis		
Callitrichidae marmosets, tamarins		
<i>Callimico goeldii</i> <i>Callithrix aurita</i> <i>Callithrix flaviceps</i> <i>Leontopithecus</i> spp. <i>Saguinus bicolor</i> <i>Saguinus geoffroyi</i> <i>Saguinus leucopus</i>		

Saguinus oedipus		
Cedidae New World monkeys		
Alouatta coibensis Alouatta palliata Alouatta pigra Ateles geoffroyi frontatus Ateles geoffroyi panamensis Brachyteles arachnoides Cacajao spp. Chiropotes albinasus Lagothrix falvicauda Saimiri oerstedii		
Cercopithecidae Old World Monkeys		
Cercocebus galeritus galeritus Cercopithecus diana Macaca silenus Mandrillus leucophaeus Mandrillus sphinx		
Nasalis concolor Nasalis larvatus Presbytis Potenziani Procolobus oemnantii kirkii Procolobus rufomitratus Pygathrix spp. Semnapius entellus Trachypitecus geei		
Trachypitecus pileatus		
Hylobatidae Gibbons		
Hylobatidae spp.		
Homindae Chimpanzees, gorilla, orang-utan		
Gorilla gorilla Pan spp. Pongo pygmaeus		
XENARTHRA		
Myrmecophagidae American anteaters		

	Myrmecophaga tridactyla	Tamandua mexicana (Guatemala)
Bradypodidae Three-toed sloth		
	Bradypus variegatus	
Megalonychidae Two-toed sloth		
		Choloepus hoffmanni (Costa Rica)
Dasypodidae Armadillos		
Priodontes maximus	Chaetophractus nationi (A zero annual export quota has been established. All specimens shall be deemed to be specimens of species included in Column I of Part 1 and the trade I them shall be regulated accordingly)	Cabassous centralis (Costa Rica) Cabassous tatouay (Uruguay)
PHOLIDOTA		
Manidae Pangolins		
	Manis spp. (A zero annual export quota has been established for Manis crassicaudata, M. javanica and M. pentadactyla for specimens removed from the wild and traded for primarily commercial purposes)	
LAGOMORPHA		
Leporidae Hispid hare, volcano rabbit		
Caprolagus hispidus Pomerolagus diazi		
RODENTIA		
Sciuridae Ground squirrels, tree squirrels		
Cynomys mexicanus		Epixerus ebii (Ghana) Marmota caudata

	Ratufa spp.	(India) Marmota himalayana (India) Sciurus deppei (Costa Rica)
Anomaluridae African flying squirrels		
		Anomalurus beecrofti (Ghana) Anomalurus derbianus (Ghana) Anomalurus pelii (Ghana) Idiurus macrotis (Ghana)
Muridae Mice, rats		
Leporillus conditor Pseudomys praeconis Xeromys myoides Zyzomys pedunculatus		
Hystriidae Crested porcupine		
		Hystrix cristata (Ghana)
Erethizontidae New World Porcupines		
		Sphiggurus mexicanus (Honduras) Sphiggurus spinosus (Uruguay)
Agoutidae Paca		
		Agouti paca (Honduras)
Dasyproctidae Agouti		
		Dasyprocta punctata (Honduras)
Chinchillidae Chinchillas		
Chinchilla spp. (Specimens of the domesticated form are not subject to the provisions of the Convention)		
CETACEA Dolphins,		

porpoises, whales		
	CETACEA spp. (Except species included in Column I of Part 1. A zero annual export quota has been established for live specimens from the Black Sea population of Tursiops truncatus removed from the Wild and traded for primarily commercial purposes)	
Plantanistidae River dolphins		
Lipotes vexillifer Platanista spp.		
Ziphiidae Beaked whales, bottled-nosed whales		
Berardius spp. Hyperoodon spp.		
Physeteridae Sperm whales		
Physeter catodon		
Delphinidae Marine dolphins		
Sotalia spp. Sousa spp.		
Phocénidae Porpoises		
Neophocaena phocaenoides Phocoena sinus		
Eschrichtiidae Grey Whale		
Eschrichtius robustus		
Balaenopteridae Humpback whale, rorquals		
Balaenoptera acutorostrata (Except the population of West Greenland, which is included in Column II of		

Part 1) Balaenoptera bonaerensis Balaenoptera borealis Balaenoptera edeni Balaenoptera musculus Balaenoptera physalus Megaptera novaeangliae		
Balaenidae Bowhead whale, right whales		
Balaena mysticetus Eubalaena spp.		
Neobalaenidae Pygmy right whale		
Caperea marginata		
CARNIVORA		
Canidae Bush dog, foxes, wolves		
Canis lupus (Only the populations of Bhutan, India, Nepal and Pakistan; all other populations are included in Column II of Part 1) Speothos venaticus	Canis lupus (Except the populations of Bhutan, India, Nepal and Pakistan, which are included in Column I of Part 1) Cerdocyon thous Chrysocyon brachyurus Cuon alpinus Pseudalopex culpaeus Pseudalopex griseus Pseudalopex gymnocereus Vulpes cana Vulpes zerda	Canis aureus (India) Vulpes bengalensis (India) Vulpes vulpes griffithi (India) Vulpes vulpes montana (India) Vulpes vulpes pusilla (India)
Ursidae Bears, pandas		
Ailuropoda melanoleuca Ailurus fulgens Helarctos malayanus Melursus ursinus Tremarctos ornatus	Ursidae spp. (Except the species included in Column I of Part 1)	

Ursus arctos (Only the populations of Bhutan, China, Mexico and Mongolia; all other populations are included in Column II of Part 1) Ursus arctos isabellinus Ursus thibetanus		
Procyonidae Coatis, kinkajou, olingos		Bassaricyon gabbii (Costa Rica) Bassariscus sumichrasti (Costa Rica) Nasua narica (Honduras) Nasua nasua solitaria (Uruguay) Potos flavus (Honduras)
Mustelidae Badgers, martens, weasels, etc.		
Lutrinae Otters		
Aonyx congicus (Only the populations of Cameroon and Nigeria; all other populations are included in Column II of Part 1) Enhydra lutris nereis Lontra felina Lontra longicaudis Lontra provocax Lutra lutra Pteronura brasiliensis	Lutrinae spp. (Except the species included I Column I of Part 1)	
Mellivorinae Honey badger		
		Mellivora capensis (Botswana, Ghana)
Mephitinae Hog-nosed skunk		
	Conepatus humboldtii	
Mustelinae Grisons, martens, tayra, weasels		
		Eira barbara (Honduras)

		Galictis vittata (Costa Rica) Martes flavigula (India) Martes foina intermedia (India) Martes gwatkinsii (India) Mustela altaica (India) Mustela erminea ferghanae (India) Mustela Kathiah (India)
Mustela nigripes		Mustela Sibirica (India)
Viverridae Binturong, civets, falanouc, fossa, linsanga, otter-civet, palm civets		
Prionodon pardicolor	Cryptoprocta ferox Cynogale bennettii Eupleres goudotii Fossa fossana Hemigalus derbyanus Prionodon linsang	Arctictis binturong (India) Civettictis civetta (Botswana) Paguma larvata (India) Paradoxurus hermaphroditus (India) Paradoxurus jerdoni (India) Viverra civattina (India) Viverra zibetha (India) Viverricula indica (India)
Herpestidae Mongooses		
		Herpestes brachyurus fuscus (India) Herpestes edwardsii (India) Herpestes javanicus auropunctatus (India) Herpestes smirhii (India) Herpestes urva (India)

		Herpestes vitticollis (India)
Hyaenidae Aardwolf		
		Proteles cristatus (Botswana)
Felidae Cats		
<i>Acinonyx jubatus</i> (Annual export quotas for live specimens and hunting trophies are granted as follows: Botswana: 5; Namibia: 150; Zimbabwe: 50. The trade in such specimens is subject to the provisions of Article III of the Convention) <i>Caracal caracal</i> (Only population of Asia; all other populations are include in Column II of Part 1) <i>Catopuma temminckii</i> <i>Felis nigripes</i>	Felidae spp. (Except the species included in Column I of Part 1. Specimens of the domesticated form are not subject to the provisions of the Convention)	
<i>Herpailurus yaguarondi</i> (Only the populations of Central and North America; all other populations are included in Column II of Part 1) <i>Leopardus pardalis</i> <i>Leopardus tigrinus</i> <i>Leopardus wiedii</i> <i>Lynx pardinus</i> <i>Neofelis nebulosa</i> <i>Oncifelis geoffroyi</i> <i>Oreailurus jacobita</i> <i>Panthera leo persica</i>		

<i>Panthera onca</i> <i>Panthera pardus</i> <i>Panthera tigris</i> <i>Pardofelis Marmorata</i> <i>Prionailurus bengalensis</i> <i>bengalensis</i> (Only the populations of Bangladesh, India and Thailand; all other populations are included in Column II of Part 1) <i>Prionailurus planiceps</i> <i>Prionailurus rubiginosus</i> (Only the population of India; all other populations are included in Column II of Part 1) <i>Puma concolor coryi</i> <i>Puma concolor</i> <i>costaricensis</i> <i>Puma concolor couguar</i> <i>Uncia uncia</i>		
Otariidae Fur seals, sea- lions		
<i>Arctocephalus townsendi</i>	Arctocephalus spp. (Except the species included in Column I of Part 1)	
Odobenidae Walrus		
		Odobenus rosmarus (Canada)
Phocidae Seals		
Monachus spp.	Mirounga leonina	
PROBOSCIDEA		
Elephantidae Elephants		
Elephas maximus Loxodonta africana (Except the populations of Botswana, Namibia, South Africa and Zimbabwe, which are included in Column II of Part 1)		
	Loxodonta Africana	

	(Only the populations of Botswana ¹ , Namibia ¹ , South Africa ¹ and Zimbabwe ² , all other populations are included in Column I of Part 1)	
SIRENIA		
Dugongidae Dugong		
Dugong Dugon		
Trichechidae Manatees		
Trichechus inunguis Trichechus manatus	Trichechus senegalensis	
PERISSODACTYLA		
Equidae Horses, wild asses, zebras		
<i>Equus africanus</i> (Excludes the domesticated form, which is reference as <i>Equus asinus</i> , and is not subject to the provisions of the Convention) <i>Equus grevyi</i>	<i>Equus hemionus</i> (Except the subspecies included in Column I of Part 1)	
<i>Equus hemionus</i>	<i>Equus kiang</i> <i>Equus onager</i> (Except the subspecies included in Column I of Part 1)	
<i>Equus onager</i> khur <i>Equus przewalskii</i>		
<i>Equus zebra zebra</i>	<i>Equus zebra hartmannae</i>	
Tapiridae Tapirs		
Tapiridae spp. (Except the species included in Column II of Part 1)	<i>Tapirus terrestris</i>	
Rhinocerotidae		

Rhinoceroses		
Rhinocerotidae spp. (Except the subspecies included in Column II of Part 1)	Ceratotherium simum simum (Only the population of South Africa; all other populations are included in Column I of Part 1. For the exclusive purpose of allowing international trade in live animals to appropriate and acceptable destinations and hunting trophies. All other specimens shall be deemed to be specimens of species included in Column I of Part 1 and the trade in them shall be regulated accordingly)	
ARTIODACTYLA		
Tragulidae Mouse-deer		
		Hyemoschus aquaticus (Ghana)
Suidae Babirusa, pygmy hog		
Babirusa babirusa Sus salvanius		
Tayassuidae Peccaries		
Catagonus wagneri	Tayassuidae spp. (Except the species included in Column I of Part 1 and the populations of Pecari tajacu of Mexico and the United States of America, which are not included in the Appendices)	

[illegible]

populations are included in Column II of Part 1)	Moschus spp. (Except the populations of Afghanistan, Bhutan, India, Myanmar, Nepal and Pakistan, which are included in Column I of Part 1)	
Cervidae Deer, guemals, muntjacs, pudus		
Axis calamianensis Axis kuhlii Axis porcinus annamiticus Blastocerus dichotomus Cervus duvaceii Cervus elaphus hanglu Cervus eldii Dama mesopotamica Hippocamelus spp. Meganuntiacus vuquanghensis Muntiacus crinifrons Ozotoceros bezoarticus Pudu puda	Cervus elaphus bactrianus Pudu mephistophiles	Cervus elaphus barbarus (Tunisia) Mazama americana cerasina (Guatemala) Odocoileus virginianus mayensis (Guatemala)
Antilocapridae Pronghorn		
Antilocapra Americana (Only the population of Mexico; no other population is included in the Appendices)		
Bovidae Antelopes, cattle, duikers, gazelles, goats, sheep, etc.		
Addax nasomaculatus	Ammotragus lervia	Antilope cervicapra

<i>Bos gaurus</i> (Excludes the domesticated form, which is referenced as <i>Bos frontalis</i>, and is not subject to the provisions of the Convention) <i>Bos mutus</i> (Excludes the domesticated form, which is referenced as <i>Bos granniens</i>, and is not subject to the provisions of the Convention)	Bison athabascæ bison	(Nepal)
<i>Bos sauveli</i> <i>Bubalus depressicornis</i> <i>Bubalus mindorensis</i> <i>Bubalus quarlesi</i> <i>Capra falconeri</i> <i>Cephalophus jentinki</i>	<i>Budorcas taxicolor</i> <i>Cephalophus dorsalis</i>	Bubalus arnee (Nepal) (Excludes the domesticated form, which is referenced as <i>Bubalus bubalis</i>)
<i>Gazella dama</i> <i>Hippotragus niger variiani</i> <i>Naemorhedus baileyi</i> <i>Naemorhedus caudatus</i> <i>Naemorhedus goral</i> <i>Naemorhedus sumatraensis</i> <i>Oryx dammah</i>	<i>Cephalophus monticola</i> <i>Cephalophus ogilbyi</i> <i>Cephalophus silvicultor</i> <i>Cephalophus zebra</i> <i>Damaliscus pygargus</i> <i>Pygargus</i> <i>Kobus leche</i>	Damaliscus lunatus (Ghana) Gazella cuvieri (Tunisia) Gazella dorcas (Tunisia) Gazella leptoceros (Tunisia)

<i>Oryx leucoryx</i> <i>Ovis ammon hodgsonii</i> <i>Ovis ammon</i> <i>Ovis nigrimontana</i> <i>Ovis orientalis ophion</i> <i>Ovis vignei vignei</i> <i>Pantholops hodgsonii</i> <i>Pseudoryx nghetinhensis</i> <i>Rupicapra pyrenaica ornata</i>	<i>Ovis ammon</i> (Except the subspecies included in Column I of Part 1) <i>Ovis canadensis</i> (Only the population of Mexico; no other population is included in the Appendices) <i>Ovis vignei</i> (Except the subspecies included in Column I of Part 1) <i>Saiga tatarica</i>	<i>Tetracerus quadricornis</i> (Nepal) <i>Tragelaphus eurycerus</i> (Ghana) <i>Tragelaphus spekii</i> (Ghana)
CLASS AVES (BIRDS)		
STRUTHIONIFORMES		
Struthionidae Ostrich		
<i>Struthio camelus</i> (Only the populations of Algeria, Burkina Faso, Cameroon, the Central African Republic, Chad, Mali, Mauritania, Morocco, the Niger, Nigeria, Senegal and the Sudan; all other populations are not included in the Appendices)		

RHEIFORMS		
Rheidae Rheas		
Rhea pennata (Except Rhea pennata pennata which is included in Column II of Part I)	Rhea americana Rhea pennata pennata	
TINAMIFORMES		
Tinamidae Tinamou		
<i>Tinamus solitarius</i>		
SPHENISCIFORMES		
SPHENISCIDAE Penguins		
<i>Spheniscus humboldti</i>	Spheniscus demersus	
PODICIPESIFORMS		
Podicipedidae Grebe		
<i>Podilymbus gigas</i>		
PROCELLARIIFORMS		
Diomedidae Albatross		
<i>Diomedea albatrus</i>		
PELECANIFORMS		
Pelecanidae Pelican		
<i>Pelecanus crispus</i>		
Sulidae Booby		
<i>Papasula abbotti</i>		
Fregatidae Frigatebird		
<i>Fregata andrewsi</i>		
CICONIIFORMES		
Ardeidae Egrets, herons		
		Ardea goliath (Ghana) Bubulcus ibis (Ghana) Casmerodius albus (Ghana) Egretta garzetta (Ghana)
Balaenicipitidae Shoebill, whale-headed stork		
	Balaeniceps Rex	
Ciconiidae Storks		
<i>Ciconia boyciana</i>		

<i>Jabiru mycteria</i>	<i>Ciconia nigra</i>	Ephippiorhynchus senegalensis (Ghana)
<i>Mycteria cinerea</i>		Leptoptilos crumeniferus (Ghana)
Threskiomithidae Ibises, spoonbills		
Geronticus eremita Nipponia Nippon	Eudocimus ruber Geronticus calvus Platalea leucorodia	Bostrychia hagedash (Ghana) Bostrychia rara (Ghana) Threskiornis aethiopicus (Ghana)
Phoenicopteridae Flamingos		
	Phoenicopteridae spp.	
ANSERIFORMES		
Anatidae Ducks, geese, swans, etc.		
<i>Anas aneklandica</i> <i>Anas laysanensis</i> <i>Anas oustaleti</i> <i>Branta canadensis</i> <i>leucopareia</i>	<i>Anas bernieri</i> <i>Anas formosa</i> <i>Branta ruficollis</i>	Alopochen aegyptiacus (Ghana) Anas acuta (Ghana) Anas capensis (Ghana) Anas clypeata (Ghana) Anas crecca (Ghana) Anas penelope (Ghana) Anas querquedula (Ghana) Aythya nyroca (Ghana)

<i>Branta sandvicensis</i> <i>Calrina scutulata</i>	<i>Coscoroba coscoroba</i> <i>Cygnus melanocorypha</i> <i>Dendrocygna arborea</i> <i>Oxyura keucicephala</i>	<i>Caririna moschata</i> (Honduras) <i>Dendrocygna autumnails</i> (Honduras) <i>Dendrocygna bicolor</i> (Ghana, Honduras) <i>Dendrocygna viduata</i> (Ghana) <i>Nettapus auritus</i> (Ghana)
FALCONIFORMES Eagles, falcons, hawks, vultures		
	FALCONIFORMES spp. (Except the species included in Column I of Part 1 and the species of the family Cathartidae, one of which is included in Column III of Part 1; the others are not included in the Appendices)	
Carthartidae New World vultures		
<i>Gymnogyps claifornianus</i> <i>Vultur gryphus</i>		<i>Sarcoramphus papa</i> (Honduras)
Accipitridae Hawks, eagles		
<i>Aquila adalberti</i> <i>Aquila heliaca</i>		

Chondrohierax uncinatus wilsonii Haliaeetus albicilla Haliaeetus leucocephalus Harpia harpyja Pithecopaga jefferyi		
Falconidae Falcons		
Falco araea Falco jugger Falco newtoni (Only the population of Seychelles) Falco pelegrinoides Falco peregrinus Falco punctatus Falco rusticolus		
GALLIFORMES		
Megapodidae Megapodes, scrubfowl		
Macrocephalon maleo		
Cracidae Chachalacas, curassows, guans		
Crax blumenbachii Mitu mitu Oreophaps derbianus Penelope albipennis		Crax alberti (Colombia) Crax daubentoni (Colombia) Crax globulosa (Colombia) Crax rubra (Colombia, Costa Rica, Guatemala, Honduras) Ortalis vetula (Guatemala, Honduras) Pauxi pauxi (Colombia)
Pipile jactinga Pipile pipile		Penelope purpurascens (Honduras) Penelopina nigra (Guatemala)
Phasianidae Grouse,		

guineafowl, partridges, pheasants, tragopans		
		Agelastes meleagrides
Catreus wallichii Colinus virginianus ridgwayi Crossoptilon crossoptilon Crossoptilon harmani Crossoptilon mantchuricum	Argusianus argus	Agriocharis ocellata (Guatemala) Arborophila charltonii (Malaysia) Arborophila orientalis (Malaysia)
Lophophorus impejanus Lophophorus lhuysii Lophophorus sclateri Lophura edwardsi	Gallus sonneratii Ithaginis cruentus	
Lophura imperialis Lophura swinhoii	Pavo muticus Polyplectron bicalcaratum	Lophura erthrophthalma (Malaysia) Lophura ignita (Malaysia)
Polyplectron emphanum	Polyplectron germaini	Melanoperdix nigra (Malaysia)
Rheinardia ocellata	Polyplectron malacense Polyplectron schleiermacheri	Polyplectron inopinatum (Malaysia)

Syrnaticus elloti Syrnaticus humiae Syrnaticus mikado Tetraogallus caspius Tetraogallus tibetanus Tragopan blythii Tragopan caboti Tragopan melancephalus Tympanuchus cupido attwateri		Rhizother longirostris (Malaysia) Rollulus rouloul (Malaysia) Tragopan satyra (Nepal)
GRUIFORMES		
Gruidae Cranes		
Grus americana Grus canadensis nesiotis Grus canadensis pulla Grus japonensis Grus leucogeranus Grus monacha Grus nigricollis Grus vipio	Gruidae spp. (Except the species included in Column I of Part 1)	
Rallidae Rail		
Gallirallus sylvestris		
Rhynochetidae Kagu		
Rhynochetos jubatus		
Otididae Bustards		
Ardeotis nigriceps Chlamydotis undulata	Otididae spp. (Except the species included in Column I of Part 1)	
Eupodotis bengalensis		
CHARADRIIFORMES		
Burhinidae Thick knee		
		Burhinus bistriatus

		(Guatemala)
Scolopacidae Curlews, greenshanks		
Numenius borealis Numenius tenuirostris Tringa guttifer		
Laridae Gull		
Larus relictus		
COLUMBIFORMES		
Columbidae Doves, pigeons		
Caloenas nicobarica		Columba guinea (Ghana) Columba iriditorques (Ghana) Columba livia (Ghana) Columba mayeri (Mauritius) Columba uncinata (Ghana)
Ducula mindorensis	Gallicolumba luzonica Goura spp.	Oena capensis (Ghana) Streptopelia decipiens (Ghana) Streptopelia roseogrisea (Ghana) Streptopelia semitorquata (Ghana) Streptopelia senegalensis (Ghana) Streptopelia turtur (Ghana)
		Streptopelia vinacea (Ghana) Treron calva (Ghana) Treron waalia (Ghana) Turtur abyssinicus (Ghana) Turtur brehmeri

		(Ghana) Turtur tympanistria (Ghana)
PSITTACIFORMES		
	PSITTACIFORMES spp. (Except the species included in Column I of Part 1 and Column III of Part 1, and excluding Melopsittacus undulatus and Nymphicus hollandicus, which are not included in the Appendices)	
Psittacidae Amazons, cockatoos, lorries, lorikeets, macaws, parakeets, parrots		
Amazona arausiaca Amazona barbadensis Amazona brasiliensis Amazona guildingii Amazona imperialis Amazona leucocephala Amazona ochrocephala auropalliata Amazona ochrocephala belizensis Amazona ochrocephala oratrix Amazona ochrocephala parvipes Amazona ochrocephala tresmariae Amazona pretrei Amazona rhodocorytha Amazona tucumana Amazona versicolor Amazona vinacea Amazona viridigenalis Amazona vittata		

Anodorhynchus spp. Ara ambigua Ara glaucogularis (often traded under the incorrect designation Ara caninde) Ara Macao Ara militaris Ara rubrogenys Cacatua goffini Cacatua haematuropygia Cacatua moluccensis Cyanopsitta spixii Cyanoramphus forbesi		
Cyanoramphus novaezelandiae Cyclopsitta diophthalma coxeni Eos histrio Eunymphicus cornutus Geopsittacus occidentalis (Possibly extinct) Guarouba guarouba Neophema chrysogaster Ognorhynchus icterotis Pezoporus wallicus Pionopsitta pileata Probosciger aterrimus Propyrrhura coultoni Propyrrhura maracana Psephotus chrysoterygius Psephotus dissimilis Psephotus pulcherrimus (Possibly extinct) Psittacula echo Pyrrhura cruentata Rhynchopsitta spp. Strigops habroptilus Vini ultramarina		Psittacula krameri (Ghana)
CUCULIFORMES		
Musophagidae Turacos		

	Musophaga porphyreolopha	Corythaeola cristata (Ghana) Crinifer piscator (Ghana) Musophaga violacea (Ghana)
	Tauraco spp.	
STRIGIFORMES Owls		
	STRIGIFORMES spp. (Except the species included in Column I of Part 1)	
Tytonidae Barn Owl		
Tyto soumagnei		
Strigidae Owls		
Athene blewitti Mimizuku gurneyi Ninox novaesselandiae undulata Ninox squamipila natalis		
APODIFORMES		
Trochilidae Hummingbirds		
Glaucis dohrnii	Trochilidae spp. (Except the species included in Column I of Part 1)	
TROGONIFORMES		
Trogonidae Quetzal		
Pharomachrus maciuno		
CORACIFORMES		
Bucerotidae Hornbills		
Aceros nipalensis Aceros subruficollis	Aceros spp. (Except the species included in Column I of Part 1)	
Buceros bicornis Buceros vigil	Anorrhinus spp. Anthracoceros spp. Bucers spp. (Except the species included in Column I of Part 1)	

	Penelopides spp.	
PICIFORMES		
Capitonidae barbet		
		Semnornis ramphastinus (Colombia)
Ramphastidae Toucans		
	Pteroglossus aracari	Bailloni bailloni (Argentina)
	Pteroglossus viridis	Pteroglossus castanotis (Argentina)
	Ramphastos sulfuratus Ramphastos toco Ramphastos tucanus Ramphastos vitellinus	Ramphastos dicolorus (Argentina)
		Selenidera maculirostris (Argentina)
Picidae Woodpeckers		
Campephilus imperialis		
Dryocopus javensis richardsi		
PASSERIFORMES		
Contingidae Cotingas		
Cotinga maculata		Cephalopterus ornatus (Colombia)
Xipholena atropurpurea	Rupicola spp.	Cephalopterus penduliger (Colombia)
Pittidae Pittas		
Pitta gurneyi Pitta Kochi	Pitta guajana Pitta nympha	
Atrichornithidae Scrub-bird		

Atrichornis clamosus		
Hirundinidae Martin		
Pseudochelidon sirintarae		
Pycnonotidae Bulbul		
	Pycnonotus zeylanicus	
Muscicapidae Old World flycatchers		
Dasyornis broadbenti litoralis (possibly extinct) Dasyornis longirostris	Cyornis ruckii Garrulax canorus Leiothrix argentauris Leiothrix lutea Liocichla Omeiensis	Bebrornis rodericanus (Mauritius) Terpsiphone bourbonnensis (Mauritius)
Picathartes gymnocephalus Picathartes oreas		
Zosteropidae White-eye		
Zosterops albogularis		
Meliphagidae Honeyeater		
Lichenostomus melanops cassidix		
Emberizidae Cardinals, tanagers		
	Gubernatrix cristata Paroaria capitata Paroaria cprpnata Tangara fastuosa	
Icteridae Blackbird		
Agelaius flavus		
Fringillidae Finches		
Carduelis cucullata	Carduelis yarrellii	
		Serinus canicapillus (Ghana) Serinus leucopygius

		(Ghana) Serinus mozambicus (Ghana)
Estrildidae Mannikins, waxbills		
	Amandava Formosa	Amadina fasciata (Ghana) Amandava subflava (Ghana) Estrilda astrild (Ghana) Estrilda caerulescens (Ghana) Estrilda melpoda (Ghana) Estrilda troglodytes (Ghana) Lagonosticta rara (Ghana) Lagonosticta rubricata (Ghana) Lagonosticta rufopicta (Ghana) Lagonosticta senegala (Ghana) Lagonosticta vinacea (Ghana) Lonchura bicolor (Ghana)
	Padda oryzivora Poephila cincta cincta	Lonchura cantans (Ghana) Lonchura cucullata (Ghana) Lonchura fringilloides (Ghana) Mandingoa nitidula (Ghana) Nesocharis capistrata (Ghana) Nigrita canicapilla (Ghana) Nigrita fusconota (Ghana)

		Nigrita luteifrons (Ghana) Ortygospiza atricollis (Ghana) Parmoptila rubrifrons (Ghana) Pholidornis rushiae (Ghana) Pyrenestes ostrinus (Ghana) Pytilia hypogrammica (Ghana) Pytilia phoenicoptera (Ghana) Spermophaga haematina (Ghana) Uraeginthus bengalus (Ghana)
Ploceidae whydahs	Weavers,	
		Amblyospiza albifrons Anaplectes rubriceps (Ghana) Anomalospiza imberbis (Ghana) Bubalornis albirostris (Ghana) Euplectes afer (Ghana) Euplectes ardens (Ghana) Euplectes franciscanus (Ghana) Euplectes hordeaceus (Ghana) Euplectes macroirus (Ghana)
		Malimbus cassini

		(Ghana) Malimbus malimbicus (Ghana) Malimbus nitens (Ghana) Malimbus rubricollis (Ghana) Malimbus scutatus (Ghana) Malimbus superciliosus (Ghana) Passer griseus (Ghana) Petronia dentata (Ghana) Plocepasser superciliosus (Ghana) Ploceus albinucha (Ghana) Ploceus aurantius (Ghana) Ploceus cucullatus (Ghana) Ploceus heuglini (Ghana) Ploceus luteolus (Ghana) Ploceus melanocephalus (Ghana) Ploceus nigerrimus (Ghana) Ploceus nigricollis (Ghana) Ploceus pelzelni (Ghana) Ploceus preussi (Ghana)
		Ploceus tricolor (Ghana) Ploceus vitellinus (Ghana) Quelea erythrops (Ghana) Sporopipes frontalis (Ghana)

		Vidua Chalybeata (Ghana) Vidua interjecta (Ghana) Vidua larvaticola (Ghana) Vidua macroura (Ghana) Vidua orientalis (Ghana) Vidua raricola (Ghana) Vidua togoensis (Ghana) Vidua wilsoni (Ghana)
Sturnidae Mynahs (Starlings)		
Leucopsar rothschildi	Gracula religiosa	
Paradisaeidae Birds of paradise		
	Paradisaeidae spp.	
	CLASS REPTILIA (REPTILES)	
TESTUDINATA		
Dermatemydidae Central American river turtle		
	Dermatemys mawii	
Platysternidae Big-headed turtle		
	Platysternon megacephalum	
Emydidae Box turtles, freshwater turtles		
Batagur baska	Annamemys annamensis	
Clemmys muhlenbergi	Callagur borneoensis Clemmys insculpta	
Geoclemys hamiltonii	Cuora spp.	

The Endangered Species (Trade and Transport) Law, 2004

Kachuga tecta	Heosemys depressa Heosemys grandis Heosemys leytensis Heosemys spenosa Hieremys annandalii Kachuga spp. (Except the species included in Column I of Part 1)	
Melanochelys tricarinata Morenia ocellata	Leucocephalon yuwono Mauremys mutica	
Terrapene coahuila	Orlitia borneensis Pyxidea mouhotii Siebenrockiella crassicollis Terrapene spp. (Except the species included in Column I of Part 1)	
Testudinidae Tortoises		
Geochelone nigra Geochelone radiata Geochelone yniphora Gopherus flavomarginatus Psammobates geometricus Pyxis planicauda Testudo kleinmanni Testudo werneri	Testudinidae spp. (Except the species included in Column I of Part 1. A zero annual export quota has been established for <i>Geochelone Sulcata</i> for specimens removed from the wild and traded for primarily commercial purposes)	
Cheloniidae marine turtles		
Cheloniidae spp.		
Dermochelyidae		

Leatherback turtle		
Dermochelys coriacea		
Trionychidae Soft-shell turtles, terrapins		
Abalone ater Aspideretes gangeticus Aspideretes hurum Aspideretes nigricans	Chitra spp. Lissemys punctata Pelochelys spp.	Trionyx triunguis (Ghana)
Pelomedusidae Afro-American side-necked turtles		
	Erymnochelys Madagascariensis Peltocephalus dumeriliana Podocnemis spp.	Pelomedusa subrufa (Ghana) Pelusios adansonii (Ghana) Pelusios casraneus (Ghana) Pelusios gabonensis (Ghana) Pelusios niger (Ghana)
Chelidae Austro-American side-necked turtle		
Pseudemys umbrina		
CROCODYLIA Alligators, caimans, crocodiles		
	CROCODYLIA spp. (Except the species included in Column I of Part 1)	
Alligatoridae Alligators, caimans		
Alligator sinensis Caiman crocodilus		

apaporiensis Caiman latirostris (Except the population of Argentina, which is included in Column II of Part 1)		
Melanosuchis niger (Except the population of Ecuador, which is included in Column II of Part 1, and is subject to a zero annual export quota until an annual export quota has been approved by the CITES Secretariat and the IUCN/SSC Crocodile Specialist Group)		
Crocodylidae Crocodiles		
<i>Crocodylus acutus</i> <i>Crocodylus intermedius</i> <i>Crocodylus mindorensis</i> <i>Crocodylus moreletii</i> <i>Crocodylus niloticus</i> (Except the populations of Botswana, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, South Africa, Uganda, the United Republic of Tanzania [subject to an annual export quota of no more than 1600 wild specimens including hunting trophies, in addition to ranched specimens], Zambia and Zimbabwe; these populations are included in Column II of Part 1) <i>Crocodylus palustris</i> <i>Crocodylus porosus</i> (Except the populations of Australian Indonesia and		

Papua New Guinea, which are included in Column II of Part 1) <i>Crocodylus rhombifer</i> <i>Crocodylus siamensis</i> <i>Osteolaemus tetraspis</i> <i>Tomistoma schlegelii</i>		
Gavialidae Gavial		
Gavialis gangeticus		
RHYNCHOCEPHALIA		
Sphenodontidae Tuatara		
Sphenodon spp.		
SAURIA		
Gekkonidae Geckos		
	Cyrtodaectylus serpensinsula Phelsuma spp.	
Agamidae Agamas, mastigures		
	Uromastyx spp.	
Chamaeleonidae Chameleons		
	Bradypodion spp. Brookesia spp. (Except the species included in Column I of Part 1)	
Brookesia perarmata	Calumnia spp. Chamaeleo spp. Furcifer spp.	
Iguanidae Iguana		
Brachylophus spp.	Amblyrhynchus cristatus	
Cyclura spp.	Conolophus spp.	
Sauromalus	Iguana spp. Phrynosoma coronatum	
Lacertidae Lizards		
Gallotia simonyi		

	Podarcis lilfordi Podarcis pityusensis	
Cordylidae Spiny-tailed lizards		
	Cordylus spp.	
Teiidae Caiman lizards, tegu lizards		
	Crocodilurus amazonicus Dracaena spp. Tupinambis spp.	
Scincidae Skink		
	Corucia zebrata	
Xenosauridae Chinese crocodile lizard		
	Shinisaurus crocodilurus	
Helodermatidae Beaded lizard, gila monster		
Varanidae Monitor lizards		
Varanus bengalensis Varanus flavescens Varanus griseus Varanus komodoensis Varanus nebulosus	Varanus spp. (Except the species included in Column I of Part 1)	
SERPENTES Snakes		
Loxocemidae Mexican dwarf boa		
	Loxocemidae spp.	
Pythonidae Pythons		
Python Molurus molurus	Pythonidae spp. (Except the subspecies included in Column I of Part 1)	
Acrantophis spp. Boa constrictor occidentalis	Boidae spp. (Except the species included in Column I of Part 1)	

Epicerates inornatus Epicerates monensis Epicerates sunflavus Sanzinix Madagascariensis		
Bolyeriidae Round Island boas		
Bolyeria multocarinata Casarea dussumieri	Bolyeriidae spp. (Except the species included in Column I of Part I)	
Tropidophiidae Wood boas		
	Tropidophiidae spp.	
Colubridae Typical snakes, water snakes, whipsnakes		
	Clelia clelia Cyclagras gigas Elachistodon westermanni Ptyas mucosus	Atretium schistosum (India) Cerberus rhynchops (India) Xenochrophis piscator (India)
Elapidae Cobras, coral snakes		
	Hoplocephalus bungaroides Naja atra Naja kaouthis Naja mandalayensis Naja naja Naja oxiana Naja Philippinensis Naja sagittifera Naja samarensis Naja siamensis Naja spetatrix	Micrurus diastema (Honduras) Micrurus nigrocinctus (Honduras)

	Naja sumatrana Ophiophagus Hannah	
Viperidae Vipers		
Vipera ursinii (Only the population of Europe, except the area which formerly constituted the Union of Soviet Socialist Republics these latter populations are not included in the Appendices)	Vipera wagneri	Crotalus durissus (Honduras) Daboia russelii (India)

CLASS AMPHIBIA (AMPHIBIANS)		
ANURA		
Bufonidae Toads		
Altiphynoides spp. Atelopus zeteki		
Bufo periglenes Bufo superciliaris Nectophynoides spp. Nimbaphrynoides spp. Spinophrynoides spp.		
Dendrobatidae Poison frogs		
	Dendrobates spp. Epipedobates spp. Minyobates spp. Phyllobates spp.	
Mantellidae Mantellas		
	Mantella spp.	
Microhylidae Red rain frog, tomato frog		
Dyscophus antongilii	Scaphiophryne gottlei	
Myobatrachidae Gastric-		

brooding frogs		
	Rheobatrachus spp.	
Ranidae Frogs		
	Euphlyctis hexadactylus Hoplobatrachus tigerinus	
CAUDATA		
Ambystomidae Axolotls		
	Ambystoma dumerilii Ambystoma mexicanum	
Cryptobranchidae Giant salamanders		
Andrias spp.		
CLASS ELASMOBRANCHII		
(SHARKS)		
ORECTOLOBIFORMES		
Rhinodontidae Whale Shark		
	Rhincodon typus	
LAMNIFORMES		
Lamnidae Great white shark		
		Carcharodon carcharias (Australia)
Cetorhinidae Basking shark		
	Cetorhinus maximus	
CLASS ACTINOPTERGII		
(FISH)		
ACIPENSERIFORMES Paddlefish, sturgeons		
	ACIPENSERIFORMES spp. (Except the species included in Column I of Part I)	

Acipenseridae Sturgeons		
Acipenser brevirostrum		
Acipenser sturio		
OSTEOGLOSSIFORMES		
Osteoglossidae Arapaima, bonytongue		
Scleropages formosus	Arapaima gigas	
CYPRINIFORMES		
Cyprinidae Blind carps, plaeesok		
Probarbus jullieni	Caecobarbus geertsi	
Catostomidae Cui-ui		
Chasmistes cujus		
SILURIFORMES		
Pangasiidae Pangasid catfish		
Pangasianodon gigas		
SYNGNATHIFORMES		
Syngnathidae Pipefishes, seahorses		
	Hippocampus spp. (Enters into effect on 15 May 2004)	
PERCIFORMES		
Sciaenidae Totoaba		
Totoaba macdonaldi		
CLASS SARCOPTERGGII		
(LUNGFISHES)		
COELACANTHIFORMES		
Latimeriidae Coelacanth		
Latimeria spp.		
CERATODONTIFORMES		
Ceratodontidae Australian lungfish		
	Neoceratodus forsteri	
PHYLUM ARTHROPODA		
CLASS ARACHNIA		

(SPIDERS)		
SCORPIONES		
Scorpionidae Scorpions		
	Pandinus dictator Pandinus gambiensis Pandinus imperator	
ARANEAE		
Theraphosidae Red-kneed tarantulas, tarantulas		
	Aphonopelma albiceps Aphonopelma pallidum Brachypelma spp. Brachypelmides klaasi	
CLASS INSECTA		
(INSECTS)		
Coleoptera		
Lucanidae Cape stag beetles		
		Colophon spp. (South Africa)
LEPIDOPTERA		
Papilionidae Birdwing butterflies, swallowtail butterflies		
	Atrophaneura jophon Atrophaneura pandiyana Bhutanitis spp.	
Ornithoptera alexandrae Papilio chikae Papilio homerus Papilio hospiton	Ornithoptera spp. (sensu D'Abbrera) (Except the species included in Column I of Part 1) Parnassius apollo Teinopalpus spp. Trogonoptera spp.	

orbiculata Lampsilis satur Lampsilis virescens Plethobasus cicatricosus Plethobasus cooperianus Pleurobema plenum	Pleurobema clava	
Potamilus capax Quadrula intermedia Quadrula sparsa Toxolasma cylindrella		
Unio nickliniana Unio tampicoensis Tecomatensis Villosa trabalis		
CLASS GASTROPODA (SNAILS AND CONCHES)		
STYLOMMATOPHORA		
Achatinellidae Agate snails, oahu tree snails		
Achatinella spp.		
Camaenidae Green tree snails		
	Papustyla pulcherrima	
MESOGASTROPODA		
Strombidae Queen conch		
	Strombus gigas	
PHYLUM CNIDARIA CLASS ANTHOZOA (CORALS, SEA ANEMONES)		
HELIOPORACEA Blue corals		
	Helioporidae spp. (Includes only the species Heliopora coerulea. Fossils are not subject to the provisions of the Convention)	

STOLONIFERA		
Tubiporidae	Organ-pipe Corals	
		Tubiporidae spp. (Fossils are not subject to the provisions of the Convention)
ANTIPATHARIA	Black corals	
		ANTIPATHARIA spp.
SCLERACTINIA	Stony corals	
		SCLERACTINIA spp. (Fossils are not subject to the provisions of the Convention)
CLASS HYDROZOA		
(SEA FERNS, FIRE CORALS, STINGING MEDUSAE)		
Milleporina		
Milleporidae	Fire Corals	
		Milleporidae spp. (Fossils are not subject to the provisions of the Convention)
STYLAETERINA		
Stylasteridae	Lace corals	
		Stylasteridae spp. (Fossils are not subject to the provisions of the Convention)
FLORA (PLANTS)		
AGAVACEAE	Agaves	
Agave arizonica		
Agave parviflora		
Nolina interrata	Agave victoriae-reginae #1	
AMARYLLIDACEAE		
Snowdrops, sternbergias		
	Galanthus spp. #1	
	Sternbergia spp. #1	

APOCYNACEAE Elephant trunks		
Pachypodium ambongense Pachypodium baronii Pachypodium decaryi	Pachypodium spp. #1 (Except the species included in Column I of Part 1) Rauvolfia serpentina #2	
ARALIACEAE Ginseng		
	Panax ginseng #3 (Only the population of the Russian Federation; no other population included in the Appendices) Panax quinquefolius #3	
ARAUCARIACEAE Monkey-puzzle tree		
Araucaria araucana		
BERBERIDACEAE May apple		
	Podophyllum hexandrum #2	
BROMELIACEAE Air plants, bromelias		
	Tillandsia harristii #1 Tillandsia kammii #1 Tillandsia kautskyi #1 Tillandsia mauryana #1 Tillandsia sprengeliana #1 Tillandsia sucreei #1 Tillandsia xerographica #1	
CACTACEAE Cacti		
Ariocarpus spp. Astrophytum asterias	CACTACEAE spp. #4 (Except the species included in Column I of Part 1)	

Aztekium ritteri		
Coryphantha werdermannii		
Discocactus spp.		
Echinocereus ferreirianus		
spp. lindsayi		
Echinocereus schmollii		
Escobaria minima		
Escobaria sneedii		
Mammillaria pectinifera		
Mammillaria solisioides		
Melocactus conoideus		
Melocactus deinacanthus		
Melocactus glaucescens		
Melocactus paucispinus		
Obregonia denegrii		
Pachycereus militaris		
Pediocactus bradyi		
Pediocactus knowltonii		
Pediocactus paradinei		
Pediocactus peeblesianus		
Pediocactus sileri		
Pelecypora spp.		
Sclerocactus brevihamatus		
spp. Tobuschii		
Sclerocactus erectocentrus		
Sclerocactus glaucus		
Sclerocactus mariposensis		
Sclerocactus mesae-verdae		
Sclerocactus nyensis		
Sclerocactus papyracanthus		
Sclerocactus pubispinus		
Sclerocactus wrightiae		
Strombocatus spp.		
Turbinicarpus spp.		
Uebelmannia spp.		
CARYOCARACEAE Ajo		
	Caryocar costaricense #1	
COMPOSITAE		
(Asteraceae) Kuth		
Saussurea costus		
CRASSULACEAE		
Dudleyas		

	Dudleys stolonifera Dudleya traskiae	
CUPRESSACEAE Alerce, cypresses		
Fitzroya cupressoides Pilgerodendron uviferum		
CYATHEACEAE Tree-ferns		
	Cyathea spp. #1	
CYCADACEAE Cycads		
Cycas beddomei	CYCADACEAE spp. #1	
DIAPENSIACEAE Oconee- bells		
	Shortia galacifolia #1	
DICKSONIACEAE Tree- ferns		
	Cibotium barometz #1 Dicksonia spp. #1 (Only the populations of the Americas; no other population is included in the Appendices)	
DIDIEREACEAE Alluaudias didiereas		
	DIDIEREACEAE spp. #1	
DIOSCOREACEAE Elephant's foot, kniss		
	Dioscorea deltoidea #1	
DROSERACEAE Venus flytrap		
	Dionaea muscipula #1	
EUPHORBIACEAE Spurges		
Euphorbia ambovombensis Euphorbia	Euphorbia spp. #1 (Except the species included in Column I of Part 1; succulent species only; artificially propagated specimens of cultivars of Euphorbia trigona are not subject to the provisions of the Convention)	

capsaintemariensis Euphorbia cremersii (Includes the forma viridifolia and the car. Rakotozafyi) Euphorbia cylindrifolia (Includes the spp. Tuberifera) Euphorbia decaryi (Includes the vars. Ampanihyensis, robinsonii and spirosticha) Euphorbia francoisii Euphorbia moratii (Includes the vars. Antsingiensis, hemarahensis and multiflora) Euphorbia parvicyathophora Euphorbia quartziticola Euphorbia tulcarensis		
FOUQUIERIACEAE Ocotillos		
Fouquieria fasciculata Fouquieria purpusii	Fouquieria columnaris #1	
GNETACEAE Gnetums		
		Gnetum montanum #1 (Nepal)
JUGLANDACEAE Gavilan		
	Oreomunnea pterocarpa #1	
LEGUMINOSAE (Fabaceae) Afromosia, cristobal, rosewood, sandalwood		
Dalbergia nigra	Pericopsis elata #5 Platymiscium pleiostachyum #1	Dipteryx panamensis (Costa Rica)

	Pterocarpus santalinus #7	
LILIACEAE Aloes		
Aloe albidula Aloe albiflora Aloe alfredii Aloe bakeri Aloe bellatula Aloe calcitrophila Aloe compressa (Includes the vars. Rugosquamosa, schistophila and paucituberculata) Aloe delphinensis Aloe descoingsii Aloe fragilis Aloe haworthioides (Includes the var. aurantiaca) Aloe laeta (Includes the var. maniaensis) Aloe parallelifolia Aloe parvula Aloe pillansii Aloe polyphylla Aloe rauhii Aloe suzannae Aloe versicolor Aloe vossii	Aloe spp. #1 (Except the species included in Column I of Part 1. Also excludes Aloe vera, also referenced as Aloe barbadensis which is not included in the Appendices)	
MAGNOLIACEAE Magnolia		
		Magnolia liliifera var. obovata #1 (Nepal)
MELIACEAE Mahoganies, Spanish cedar		

	<i>Swietenia humilis</i> 31 <i>Swietenia macrophylla</i> #6 (Populations of the Neotropics) [Enters into effect on 15 November 2003] <i>Swietenia mahagoni</i> #5	<i>Cedrela odorata</i> #5 [Population of Colombia (Colombia) Population of Peru (Peru)] <i>Swietenia macrophylla</i> #5 (Until 15 November 2003) [Population of Bolivia (Bolivia) Population of Brazil (Brazil) All populations of the species in the Americas (Costa Rica) Population of Colombia (Colombia) Population of Mexico (Mexico) Population of Peru (Peru)]
NEPENTHACEAE Pitcher-plants (Old World)		
<i>Nepenthes khasiana</i> <i>Nepenthes rajah</i>	<i>Nepenthes</i> spp. #1	
ORCHIDACEAE Orchids		
	ORCHIDACEAE spp. 8 #8 (Except the species included in Column I of Part 1)	
(For all the following Column I of Part 1 species, seedling or tissue cultures obtained in vitro, in solid or		

liquid media, transported in sterile containers are not subject to the provisions of the Convention) Aerangis ellisii Cattleya trianaei Dendrobium cruentum Laelia jongheana Laelia lobata Paphiopedilum spp. Peristeria elata Phragmipedium spp. Renanthera imschootiana Vanda corrulata		
OROBANCHACEAE Broomrape		
	Cistanche deserticola	
PALMAE (Arecaceae) Palms		
	Beccariophenic madagascariensis Chrysaildodocarpus decipiens #1 Lemurophoenix halleuxii Marojeja darianii Neodopsis decaryi #1 Ravenea louvelii Ravenea rivularis Satranala decussilvae Voanioala gerardii	
PAPAVERACEAE Poppy		
		Meconopsis regia #1 (Nepal)
PINACEAE Guatemala fir		
Abies guatemalensis		
PODOCARPACEAE Podocarps		
Podocarpus parlatorei		Podocarpus neriifolius #1 (Nepal)
PORTULACACEAE Lewisias, portulacas, purslanes		

	Anacampseros spp. #1 Avonia spp. #1 Lewisia serrata #1	
PRIMULACEAE Cyclamens		
	Cyclamen spp. " #1	
PROTEACEAE proteas		
	Orothamnus zeyheri #1 Protea odorata #1	
RANUNCULACEAE Golden seals, yellow adonis, yellow root		
	Adonis vernalis #2 Hydrastis canadensis #3	
ROSACEAE African cherry, stinkwood		
	Prunus africana #1	
RUBIACEAE Ayuque		
Balmea stormjiae		
SARRACENIACEAE Pitcher-plants (New World)		
Sarracenia rubra Spp. Alabamensis Sarracenia rubra spp. Jonesii Sarracenia oreophila	Sarracenia spp. #1 (Except the species included in Column 1 of Part 1)	
SCROPHULARIACEAE Kutki		
	Picrorhiza kurrooa #3 (Excludes Picrorhiza scrophulariiflora)	
STANGERIACEAE Stangerias		
Stangeria eriopus	Bowenia spp. #1	
TAXACEAE Himalayan yew		
	Taxus wallichiana #2	
TROCHODENDRACEA (Tetracentraceae) Tetracentron		

		Tetracentron sinense #1 (Nepal)
THYMELAEACEAE (Aquilariaceae) Agarwood, ramin		
	Aquilaria malaccensis #1	Gonystylus spp. #1 (Indonesia)
VALERIANACEAE Himalayan spikenard		
	Nardostachys grandiflora #3	
WELWITSCHIACEAE Welwitschia		
	Welwitschia mirabilis #1	
ZAMIACEAE Cycads		
	ZAMIACEAE spp. #1 (Except the species included in Column I of Part 1)	
Ceratozamia spp. Chigua spp.		
Encephalartos spp. Microcycas calcocoma		
ZINGIBERACEAE Ginger lily		
	Hedychium philippinense #1	
ZYGOPHYLLACEAE Lignum-vitaw		
	Guaiacum spp. #1	

PART 2

COLUMNS I, II and III

species which are indigenous to or occur naturally in the Islands and are listed in Appendix I, II or III to the Convention;

I	Column II
CETACEA Dolphins, porpoises, whales	CETACEA spp. (Except the species included in Part I.)
Balaenopteridae Humpback whale, rorquals - (Recorded from the Caribbean, though not yet in Cayman water) <i>Balaenoptera acutorostrata</i> (Minke Whale) <i>Balaenoptera borealis</i> (Lesson-Sei Whale) <i>Balaenoptera edeni</i> (Anderson-Bryde's Whale) <i>Balaenoptera musculus</i> (Blue Whale) <i>Balaenoptera physalus</i> (Fin Whale) <i>Megaptera novaeangliae</i> (Humpback Whale)	
Psittacidae Amazons, cockatoos, lorries, lorikeets, macaws, parakeets, parrots <i>Amazona leucocephala</i> (Cayman Parrots)	
Cheloniidae Marine turtles Cheloniidae spp. Dermochelyidae Leatherback turtle <i>Dermochelys coriacea</i>	
Tropidophiidae Wood boas, including the Cayman Ground Boa	Tropidophiidae spp
Iguanidae Iguanas, including the Cayman Islands Blue Iguanas <i>Cyclura spp.</i>	
Rhincodontidae Whale shark	<i>Rhincodon typus</i>
Strombidae Queen conch	<i>Strombus gigas</i>
ANTIPATHARIA Black corals	ANTIPATHARIA spp.
SCLERACTINIA Stony corals	SCLERACTINIA spp.
Milleporidae Fire corals	Milleporidae spp.
CACTACEAE Cacti	CACTACEAE spp
CYCADACEAE Cycads	CYCADACEAE spp
EUPHORBIACEAE Spurges	<i>Euphorbia spp.</i>
MELIACEAE Mahoganies, Spanish cedar	<i>Swietenia mahagoni</i>
ORCHIDACEAE Orchids	ORCHIDACEAE spp

COLUMN IV

Other species which are indigenous to or occur naturally in the Islands and which are considered by the Scientific Authority to have populations in the Islands which would be at risk from unregulated trade.

COLUMN IV

Anthozoa spp.	Soft Corals (including Gorgonians and Sea Fans)
Palinura spp.	Lobsters

PART 3

Species which are considered by the Scientific Authority to require strict regulation of their trade because of their potential threat to the survival, health, genetic integrity or viability of populations of any other species indigenous to or occurring naturally in the Islands.

Lionfishes

Pterois spp.

Dendrochirus spp.

Stonefish

Scorpaenidae spp.

Synanceiidae spp.

Sea Lampreys

Petromyzonidae spp.

Eels

Anguilla spp.

Lizard Fishes

Synodus spp.

Sleepers

Dormitator maculatus

Eleotris spp.

Amblyeleotris spp.

Ariid Catfishes

Ariidae spp.

Weakfish

Cynoscion regalis

Bluefish

Pomatomus saltatrix

Marine Shrimp

Penaeus spp.

Liopenaeus spp.

Farfantepenaeus spp.

Green Crab

Carcinus maenus

Crown-of-Thorns Starfish

Acanthaster planci

Malaniid Snails

Melanoides spp.

Green & Brown Mollusks

Perna viridis

Perna perna

Green Algae

Chlorophyta spp.

Brown Algae

Phaeophyta spp.

Red Algae

Rhodophyta spp.

Live Rock

Scleractinia spp. And associated epibionts

Aiptasia Anemones

Aiptasia spp.

Piranhas

Serrasalmus spp.

Catoprion spp.

Pygocentrus spp.

Pygopristis spp.

Sharks

Carcharhiniformes spp.

Heterodontiformes spp.

- Hexanchiformes spp.**
- Lamniformes spp.**
- Orectolobiformes spp.**
- Pristiophoriformes spp.**
- Squaliformes spp.**
- Squatiniiformes spp.**
- Pacus
 - Colossoma spp.**
 - Piaractus spp.**
- Rhaphiodontid characins
 - Rhaphiodon vulpinus**
 - Hydrolycus spp.**
 - Cynodon spp.**
- Pike characins
 - Ctenolucius spp.**
- Luciocharax spp. (synonymous wht Boulengrella spp. & Hydrocinus spp.)**
- Hepsetus odoe**
- Tiger characins
 - Hoplias spp.**
- Dorados/Dourados
 - Salminus spp.**
- Tilapia
 - Tilapia spp.**
 - Sarotherodon spp.**
 - Oreochromis spp.**
- Mayan Cichlid / Mexican Mojarra
 - Cichlasoma urophthalmus/froshelii**
- Guapote tiger
 - Parachromis managuensis (Cichlasoma managuense)**
- Peacock Bass
 - Cichla ocellaris**
- Pike cichlids
 - Crenicichla spp.**

Walking Catfish

Clariidae spp.

Flathead Catfish

Polydictus olivarius

Clarotes Catfish

Clarotes spp.

Red-Tailed Catfish

Phractocephalus spp.

Bumblebee Catfish

Batrachoglanis acanthochirodes

Lophiosilurus alexandri

Shovelnose Catfishes

Pseudoplatystoma spp.

Sorubimichthys planiceps

Merodontotus tigrinus

Sorubim cuspicaudus

Pimelodid Catfishes

Brachyplatystoma spp.

Gosline platynema

Perrunichthys perruno

Pirirampus pirinampu

Platynemichthys notatus

Platysilurus malarmo

Zungaro zungaro

Eel-Tail Catfishes

Euristhmus spp.

Helicopoter Catfishes

Wallago attu

Wallago dinema

Wallago heterorhynchus

Wallago leeri

Wallago maculatus

Wallago miostoma

Parasitic Catfishes

Stegophilinae spp.

Vandellinae spp.

Asian Swamp Eel

Monopterus spp.

Fluta spp.

Marbled Swamp Eels

Synbranchus marmoratus/afer

Climbing Perches

Anabas testudineus

Anabantidae spp.

Pike Killifish / Top Minnow

Belonesox belizanus

Blackcarp

Mylopharyngodon piceus

Bowfin

Amia calva

Amiidae spp.

Arawanas / Bony Tongues

Osteoglossidae spp.

Knife Fishes

Chitala spp.

Notoptrus spp.

Papyrocranus spp.

Snakeheads

Channidae spp.

Purple Stripe Gudgeon

mogurnda mogurnda

Bichir Fishes

Polypterus spp.

Gar Spikes

Lepisosteidae spp.

Asian Pike Heads

Lucicephalidae spp.

Nile Perch

Lates spp.

Sunfish / Bluegill

Lepomis cyanellus

Lepomis auritus

Lepomis gibbosus
Lepomis macrochirus
Lepomis microlophus

Oriental Weatherfish

Misgurnus anguillicaudatus

Mosquito Fish

Limia spp.

Gambusia spp.

Red-Eared Slider

Trachemys elegans

African Dwarf Frog

Hymenochirus curtipes

African Clawed Frog

Xenopus laevis

African Bullfrog

Rana catesbeiana

Marine Toad

Bufo marinus

Crayfish

Orconectus rusticus

Astacopsis spp.

Cherax spp.

Mittencrabs

Eriocheir spp.

Freshwater Shrimp

Macrobrachium spp.

Asian Clams

Corbicula spp.

Aple Snails

Pomacea spp.

Zebra Mussel

Dreissena polymorpha

Giant Ram's-horn Snails

Marisa spp.

African Elodeas

Lagarosiphon spp.

Alligator Weeds

Alternanthera spp.

Asian Marshweed or Ambulia

Limnophila sessiliflora

Brazilian Elodea

Egeria densa

Curly Pondweeds

Potamogeton spp.

Duckweeds

Lemnaceae spp.

Fanwort

Cabomba caroliniana

Hydrilas

Hydrilla spp.

Indian Swamp Weed

Hygrophila polysperma

Melaleuca

Melaleuca quinquenervia

Salvinias

Salvinia spp.

Water Chestnut

Trapa spp.

Water Lettuce

Pistia stratiotes

Water Milfoils

Myriophyllum spp.

Water Spinach

Ipomoea aquatica/fistulosa

Yellow Floating heart

Nymphoides peltata

Passed by the Legislative Assembly the 16th day of June, 2004.

LINFORD PIERSON

Speaker.

WENDY LAUER EBANKS

Clerk of the Legislative Assembly.

CHAPTER 112.

TURTLE

(24th September, 1951)

1. This Ordinance may be cited as the Turtle Ordinance.
2. In this Ordinance, the word “turtle” means sea or river turtle
3. Any person who –
 - (a) catches or takes, or attempts to catch or take, or causes to be caught or taken any turtle between the first day of June and the thirtieth day of September, both days inclusive; or
 - (b) at any time catches or takes or attempts to catch or take, or causes to be caught or taken, any turtle which is under twenty pounds in weight; or
 - (c) slaughters any turtle or buys, sells, exposes for sale or has in his possession the whole or any portion of the meat of such a turtle, between the first day of June and the thirtieth day of September, both days inclusive; or
 - (d) takes, or attempts to take, or causes to be taken any turtle eggs, between the first day of June and the thirtieth day of September, both days inclusive; or
 - (e) buys, sells, exposes for sale or has in his possession any turtle eggs, between the first day of June and the thirtieth day of September, both days inclusive:

shall be guilty of an offence against this Ordinance, and, on summary conviction, shall be liable to a fine not exceeding forty-eight dollars.

4. If any police officer shall have reasonable grounds for believing that any person is committing or attempting to commit an offence against this Ordinance he may arrest such person without warrant.
5. Any police officer may seize any turtle or part thereof or any turtle eggs found in the possession of any person between the first day of June and the thirtieth day of September in any year and upon conviction of such person the articles so seized shall be forfeited.
6. Any net, instrument or thing which any police officer has reasonable grounds for believing is being or has been used for or in connection with the commission of any offence against this Ordinance shall be seized by such police officer, and any magistrate may, upon conviction of any person for such an offence against this ordinance in connection with which such net, instrument or things so seized was used, order such net, instrument or thing to be forfeited.

TURTLE ACT 2002

ARRANGEMENTS OF SECTIONS

SECTION

1. Short title
2. Interpretation
3. Offences
4. Power of Arrest
5. Forfeiture of turtle, & c
6. Forfeiture of nets, & C
7. Research
8. Repeal

A BILL FOR

AN ACT to update the Turtles Ordinance (Cap. 112)

BE IT ENACTED by the Queen's Most excellent Majesty, by and with the advice and consent of the Legislative Council of Montserrat, and by the Authority of the same as follows:-

Short title

1. This Act may be cited as the Turtle Act 2002.

Interpretation

2. In this Act, the word "turtle" means a sea or a river turtle.

Offences

3. Any person who –
 - (a) catches or takes, or attempts to catch or take, or causes to be caught or taken any turtle
 - (i) at any time on land; or
 - (ii) between the first day of March and the first day of December, in any year at sea; or
 - (b) at any time catches or takes or attempts to catch or take, or causes to be caught or taken, any turtle which is under fifty pounds in weight; or
 - (c) at any time takes, or attempts to take, or causes to be taken any turtle eggs; or
 - (d) slaughters any turtle or buys, sells, exposes for sale or has in his possession the whole or any portion of the meat of a turtle, between the first day of March and the first day of December in any year; or
 - (e) buys, sells, exposes for sale or has in his possession any turtle eggs at any time shall be guilty of an offence under this Act and shall, on summary conviction, be liable to a fine not exceeding five thousand dollars and shall in default be liable to imprisonment for a term of three months.

Power of Arrest

4. If any police officer or fisheries officer shall have reasonable grounds for believing that any person is committing or attempting to commit an offence against this Act he may arrest such person without warrant.

Forfeiture of turtle, & c

5. Any police officer or fisheries officer may seize any turtle or part thereof in the possession of any person between the first day of March and the first day of December in any year and may seize any turtle eggs in the possession of any person at any time of the year.

Forfeiture of nest, & c

6. Any vessel, vehicle, net, instrument or thing which any police officer or fisheries officer has reasonable grounds for believing is being or has been used for or in connection with the commission of any offence against this Act shall be seized by such officer, and any magistrate may, upon conviction of any person for such an offence against this Act in connection with which such vessel, vehicle, net, instrument or things so seized was used, order such vessel, vehicle, net, instrument or thing to be forfeited.

Research

7. The provisions of this Act shall not apply to any person who is by virtue of office or under a special authorization granted by the Minister permitted to catch turtles for the purposes of research and monitoring; the persons entitled to do so by virtue of office shall be fisheries officers or research officers of the Fisheries Department in the execution of their duties.

Repeal

8. The Turtle Ordinance (Cap 112) is hereby repealed.



TURKS AND CAICOS ISLANDS

CHAPTER 104
FISHERIES PROTECTION ORDINANCE
and Subsidiary Legislation

Revised Edition
showing the law as at 15 May 1998

This is a revised edition of the law, prepared by the Law Revision Commissioner under the authority of the Revised Edition of the Laws Ordinance 1997.

This edition contains a consolidation of the following laws—

FISHERIES PROTECTION ORDINANCE

Page
3

Ordinance 5 of 1941 .. in force 30 August 1941

Amended by Ordinance 9 of 1942

Amended by Ordinance 13 of 1949

Amended by Ordinance 9 of 1973 .. in force 31 December 1973

FISHERIES PROTECTION REGULATIONS – Section 3

5

Legal Notice 16 of 1989 .. in force 28 July 1989

Amended by L.N. 39/1995 .. in force 1 August 1995

INDEX

65

CHAPTER 104**FISHERIES PROTECTION ORDINANCE**

(Ordinances 5 of 1941, 9 of 1942, 13 of 1949 and 9 of 1973)

Commencement

[30 August 1941]

Short title

1. This Ordinance may be cited as the Fisheries Protection Ordinance.

Interpretation

2. In this Ordinance “marine product” means any fish, aquatic animal or vegetable matter living in water including turtles, carcharinidae, cetacea, crustacea, molluscs and spongiae.

Power to make
Regulations

3. The Governor may make regulations for the better carrying out of this Ordinance and in particular but without prejudice to the generality of the foregoing power for the following purposes—

- (a) prohibiting, restricting or regulating the taking, capturing, killing or destroying of any kind or species of marine product or species of marine product of any specified size or description within the fishery limits of the Turks and Caicos Islands either generally or at any particular time or within any particular area;
- (b) providing for the granting and revocation of licences, containing such conditions as may be specified for the taking, capturing, killing, destroying, curing, canning, processing, manufacturing or exporting of all or any species of marine product;
- (c) restricting, regulating or controlling the methods and apparatus used in connection with the taking, capturing, killing, or destroying of any species of marine product;
- (d) prohibiting, restricting, regulating or controlling the marketing or exportation of any species of marine product or of any particular class or grade of marine product whether in a manufactured state or not;
- (e) prohibiting, restricting, regulating or controlling the curing, canning, processing or manufacturing

- of any species of marine product and the grading thereof, and in particular specifying the type, size or grade of marine product to be cured, canned, processed or manufactured;
- (f) providing for the examination or inspection of all or any species of marine product taken, captured, killed or destroyed;
 - (g) providing for the examination or inspection of any net, gear, boat or apparatus used in connection with the taking, capturing, killing or destroying of any species of marine product;
 - (h) providing for the seizure, forfeiture and disposal of any marine product, taken, captured, killed or destroyed in contravention of any regulations made under this Ordinance;
 - (i) providing for the seizure, forfeiture and disposal of any net, gear, boat or apparatus used in connection with the taking, capturing, killing or destroying of any marine product in contravention of any regulations made under this Ordinance or of any term of a licence issued under this Ordinance;
 - (j) prescribing penalties not exceeding a fine of \$50,000 or a term of imprisonment for twelve months or to both such fine and imprisonment for the contravention of any regulations made under this Ordinance or of any term of a licence issued under this Ordinance; (*Amended by Ord. 9 of 1973*)
 - (k) providing for the charging and collection of fees for licences to take, capture, kill or destroy all or any species of marine product in all or any of the fishery limits of the Islands by all or any class of persons.

4. The Governor may grant to any person or corporation an exclusive licence subject to such conditions as may be therein specified for the curing, canning, processing or manufacture of any species of marine product for export or for the exportation of any species of marine product.

Grant of licences

FISHERIES PROTECTION REGULATIONS

ARRANGEMENT OF REGULATIONS

PART I

PRELIMINARY

REGULATION

1. Short title
2. Application
3. Interpretation

PART II

LICENSING PROVISIONS

4. Restriction on taking, processing, etc. marine products without a licence
5. Vessel used for fishing to be licensed
6. Types of licences
7. Application for and issue of licences
8. Access agreements

PART III

CONSERVATION PROVISIONS

9. Restrictions on means of taking marine products and harmful activities
10. Restrictions relating to sea bed
11. Prohibition on spearguns and Hawaiian slings
12. Close season
13. Prohibited areas
14. Legal size
15. Restrictions relating to crawfish
16. Restrictions relating to sponges
17. Restrictions relating to turtles
18. Restrictions relating to marine mammals
19. Fish pots and traps
20. Nets
21. Sports fishing tournament
22. Employment restrictions in commercial fishing
23. Restrictions on purchase and sale of marine products
24. Storage of gear

25. Transhipment of catch

PART IV

FISH AGGREGATING DEVICES

26. Fish aggregating device

PART V

FISHERIES MANAGEMENT AND DEVELOPMENT

27. Fishery advisory committee
28. Fishery plan

PART VI

ENFORCEMENT

29. Powers of fishery officer
30. Search warrants
31. Seizure of vessels, gear etc
32. Production of licences
33. Forfeiture upon conviction
34. Evidence
35. Interfering with fishery protection equipment
36. Trial and penalties
37. Rewards
38. Naval personnel deemed to be fishery officers

SCHEDULE 1: Prescribed forms

- Form A1. Application for mouchoir bank licence
Form B1. Application for processing or export licence
Form C1. Application for aquarium licence
Form D1. Application for scientific and research licence
Form F1. Application for coral licence
Form G1. Application for commercial fisherman's licence
Form H1. Application for sports fishing licence
Form I1. Application for commercial fishing vessel licence
Form J1. Application for sports fishing vessel licence
Form K1. Application for ordinary fishing vessel licence
Form L1. Application for renewal of licence

SCHEDULE 2: Prescribed forms

- Form A2. Mouchoir bank licence
Form B2. Processing or export licence

Form C2. Aquarium collecting licence
Form D2. Scientific and research licence
Form F2. Coral licence
Form G2. Commercial fisherman's licence
Form H2. Sports fishing licence
Form I2. Commercial fishing vessel licence
Form J2. Sports fishing charter vessel licence
Form K2. Ordinary fishing vessel licence
Form M2. Authority to issue licences
Form N2. Authority to commercial fisherman

SCHEDULE 3: Licence Fees

SCHEDULE 4: Implied terms

FISHERIES PROTECTION REGULATIONS – SECTION 3

(Legal Notice 16 of 1989 and Legal Notice 39 of 1995)

***Made by His Excellency the Governor in Executive Council under
section 3 of the Fisheries Protection Ordinance.***

[28 July 1989]

Commencement

PART I

PRELIMINARY

1. These Regulations may be cited as the Fisheries Protection Regulations.

Short title

2. These Regulations apply to the Islands and to the fishery limits thereof as defined by Section 3 of the Fishery Limits Ordinance and extended by the Turks and Caicos Islands Fisheries Zone Proclamation .

Application

Cap. 105

3. (1) In these Regulations, unless the context otherwise requires—

Interpretation

“bang stick” means a firearm the barrel of which is attached by some means to a spear or lance, and the ammunition of which is activated by the spear or lance head when the barrel head comes in contact with any object;

“Belonger” has the meaning ascribed to it by the Immigration Ordinance;

Cap. 51

“close season” means in relation to any particular species of marine product the close season for that marine product under the provisions of regulation 12;

“commercial fishing” means fishing carried on wholly or partly for financial reward or other material gain;

“crawfish” means the spiny lobster, the slipper lobster, the smooth tailed lobster, the spotted lobster or crayfish or the species *Panulirus Argus* or *Panulirus Guttatus* or *Scyllarides*;

“export” includes the transport of any marine product taken in the fishery limits to a place outside of the Turks and Caicos Islands whether or not the same has previously been imported into the Turks and Caicos Islands;

“fish aggregating device” means any apparatus or device designed for or intended for use in attracting any marine product into a particular area or for facilitating fishing for any marine product;

“fishing” includes catching, taking, killing or removing from the sea or attempting to catch, take, kill or remove from the sea any marine product by any means or method or placing or retrieving any fish aggregating device or searching for any marine product for the purpose of fishing;

“fishery officer” means any person appointed as such under section 4 of the Fishery Limits Ordinance and any member of Her Majesty’s naval forces acting under regulation 38; provided that every member of the Police Force shall be deemed to have been authorised to be a fishery officer for the purposes of subsection (2) of section 4 of the Fishery Limits Ordinance;

Cap. 130

“foreign owned vessel” means a vessel owned by a person or persons who are not Belongers and in the case of a vessel owned by a partnership or a company means a vessel owned by a partnership or a company in which a Belonger or Belongers do not have the controlling interest (within the meaning of the Business Licensing Ordinance);

“Hawaiian sling” means a spear not exceeding five feet in length projected by a device consisting only of elastic material not exceeding eighteen inches in length and one half inch in width;

“Islands” means the Turks and Caicos Islands and includes the Territorial Sea;

“issuing authority” means in relation to a licence the authority empowered to issue that particular licence under the provisions of regulation 7;

“legal size” means in relation to any particular marine product the minimum size permitted for the taking or possession of that product as defined in regulation 14;

“licence” means a licence issued under the provisions of these Regulations, and grammatical variations and cognate expressions shall be construed accordingly;

“local” in relation to a vessel means a vessel which is not a foreign owned vessel;

“master” in relation to a vessel means the person in command or in charge of the vessel or the fishing operations aboard the vessel or any person aboard the vessel who does any act consistent with the same;

“measuring gauge” means a device so constructed as to be capable of accurately determining the legal size for the purposes of regulation 14;

“Minister” means the Minister for the time being charged with responsibility for fisheries;

“overall length” in relation to a vessel means the length measured from the foremost part of the hull over the deck to the rear most part of the

hull and includes any extension to the hull in the form of bow or transom platform;

“process” in relation to any species of marine product, includes manufacturing (including the use of any part of that product in any manufacturing process), bottling, canning, curing, freezing or otherwise preparing or preserving the marine product for use as food or for any commercial purpose but does not include the taking or cleaning and chilling of marine products;

“prohibited area” means any area declared as such under regulation 13;

“prohibited apparatus” or “prohibited method” means in relation to any particular species of marine product any apparatus or method prohibited to be used for the taking of that marine product by these Regulations or which is declared to be a prohibited apparatus or method by the Minister by notice in the *Gazette*;

“resident” means a person who—

- (a) is a Belonger; or
- (b) possesses a valid permanent resident certificate or a valid work permit issued in accordance with the Immigration Ordinance;

“scuba equipment” includes any self-contained underwater breathing apparatus other than a snorkel;

“snorkel” means a device comprising a tube not more than eighteen inches long which enables any person, whilst completely or partially submerged beneath the water, to breathe natural air without the use of a compressor or any artificial substitute for natural air;

“spear fishing” means taking or attempting to take any species of marine product, by means of a spear of any description, shape or size including a Hawaiian sling;

“spear gun” means any weapon, apparatus or mechanism other than a Hawaiian sling, so constructed as to be capable of use under water for the discharge (whether complete or partial) of any projectile, whether or not a spear or harpoon;

“sports fishing” (or “fishing for sport”) means fishing for any species of marine product for pleasure or recreation and not for gain or reward;

“taking” in relation to any particular species of marine product includes capturing, destroying or in any manner killing or removing from the sea that marine product, and grammatical variations shall be construed accordingly;

“vessel” includes an aircraft, a hovercraft and any ship, boat, lighter or other floating craft and where the context so admits includes all boats and gear and equipment carried thereon;

“visitor” means a bona fide visitor who, at the time of landing and throughout the period during which he remains in the Islands, complies with the following conditions—

- (a) he has a valid ticket or means of travelling to some other country where he will be permitted to enter;
- (b) his stay in the Islands is limited to 60 days from the date of landing therein;
- (c) he does not behave in a manner prejudicial to the peace, order and good government of the Islands; and
- (d) he does not engage in gainful occupation;

“worked black coral” means black coral worked into jewellery.

(2) In these Regulations a reference to any conch, crawfish, lobster, fish, turtle or other marine product shall include any part thereof as the context so admits.

PART II

LICENSING PROVISIONS

Restriction on
taking,
processing, etc.
marine products
without a licence

4. (1) Subject to the provisions of paragraph (2) any person who, not being the holder of and acting in conformity with the conditions of a licence authorising him so to do:

- (a) takes any species of marine product; or
- (b) processes or exports any species of marine product,

shall be guilty of an offence and liable on summary conviction to a fine of \$50,000 or to imprisonment for twelve months, or to both such fine and imprisonment.

(2) Notwithstanding that he is not the holder of a licence authorising the taking, processing or exporting of marine products (as the case may be)—

- (a) a Belonger (except during any close season for that species of marine product or by a prohibited apparatus or method) may take or process reasonable quantities of any species of marine product for pleasure or recreation or for consumption by himself or in his home;
- (b) any person proceeding to a place outside the Islands, upon payment of any export duty payable under any law for the time being in force, may take with him any worked black coral, not more than three of any sponge or in the case of any other species of marine product other than black coral not more than ten pounds in weight of each of any species

of marine product without being the holder of an export licence;

- (c) any non Belonger being the holder of a valid licence issued under regulation 6(1)(h) proceeding to a place outside the Islands, upon payment of any export duty payable under any law for the time being in force, may (with the prior written consent of a Fishery Officer) in addition to the marine products specified in paragraph (b) take with him one fish of unlimited weight for the purpose of mounting as a trophy.

5. (1) Any person who causes or permits to be used or uses any vessel for commercial fishing unless the vessel is licensed for that purpose under regulation 6(1)(e) or 6(1)(i) shall be guilty of an offence and liable on summary conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment.

Vessel used for
fishing to be
licensed

(2) Any person who charters, hires out or otherwise makes available for reward any vessel for use by persons fishing for sport, or the master of any such vessel shall, unless—

- (a) that vessel is licensed for that purpose under regulation 6(1)(j); and
- (b) those persons using that vessel for fishing for sport are each licensed for that purpose under regulation 6 (1)(h),

be guilty of an offence and be liable upon summary conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment.

(3) Any person who causes or permits to be used or uses any vessel for fishing unless that vessel is licensed for that purpose under regulation 6(1)(k) shall be guilty of an offence and liable on summary conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment; provided that this paragraph shall not apply in the case of any vessel licensed for commercial fishing under regulation 6(1)(e) or 6(1)(i) or licensed for sports fishing charters under regulation 6(1)(j) and provided also that this paragraph shall not apply in the case of any vessel entering the Islands for a period of less than one month.

(4) Any person who causes or permits to be used or uses for the purposes mentioned in paragraphs (1) or (2) any vessel in respect of which a licence is in force shall display the number of the licence in a prominent place on the vessel, and upon failure so to do shall be guilty of an offence: provided that the Chief Fishery Officer may direct in particular cases the manner in which the licence shall be displayed.

6. (1) The following licences may be issued under these

Types of licences

Regulations:—

- (a) A Mouchoir Bank Licence: for the operation of a fishing vessel or vessels in the area of the Mouchoir Bank;
- (b) A Processing or Export Licence: for the processing and/or exporting of any species of marine product;
- (c) An Aquarium Licence: for the taking of any species of marine product for export alive for use in an Aquarium;
- (d) A Scientific and Research Licence: for the taking and/or processing and/or exporting of any species of marine product for scientific and research purposes;
- (e) An Access Agreement Licence: for commercial fishermen and commercial fishing vessels operating within the fishery limits under an Access Agreement;
- (f) A Coral Licence: for the taking and/or processing and/or exporting of any species of coral for commercial purposes;
- (g) A Commercial Fisherman's Licence: authorising the holder to engage in commercial fishing within the fishery limits and to sell or otherwise dispose of for gain the marine products taken: provided that a licence issued under this paragraph shall not permit the holder to engage in fishing in the area of the Mouchoir Bank unless he is aboard a vessel licensed under the provisions of paragraph (a); and provided also that no licence under this paragraph may be issued to persons other than Belongers;
- (h) A Sports Fishing Licence: authorising the holder to engage in fishing in any area of the fishery limits and:

to retain in any one day's fishing for consumption by the holder of the licence or in the home of the holder of the licence marine products not exceeding ten pounds (10 lbs) in weight in total; and

to retain during the term of the licence as a trophy one fish of unlimited size or such greater number of fish as the Chief Fishery Officer acting in his discretion shall in writing deem reasonable:

Provided that a licence issued under this paragraph shall not permit the holder to engage in fishing in the area of the Mouchoir Bank unless he is aboard a vessel licensed under the provisions of paragraph (a) and provided also that a licence issued under this paragraph shall not prohibit a licence holder who has taken fish aboard a vessel licensed under paragraph (j) from giving (but not selling or otherwise disposing for gain or reward)

any fish so taken to a Belonger employed aboard the said vessel who is in possession of a valid commercial fisherman's licence;

- (i) A Commercial Fishing Vessel Licence: authorising the use of a particular vessel for commercial fishing by the holder of a commercial fishermen's licence in any area of the fishery limits other than the Mouchoir Bank:

Provided that no licence issued under this paragraph may be issued to persons other than Belongers;

- (j) Sports Fishing Charter Vessel Licence: authorising the use of a particular vessel for hire or other reward by persons fishing for sport in any area of the fishery limits other than the Mouchoir Bank;
- (k) Ordinary Fishing Vessel Licence: authorising the use of a particular vessel for fishing other than commercial fishing and other than for hire or reward by persons fishing for sport in any area of the fishery limits other than the Mouchoir Bank;
- (l) A Tournament Fishing Licence: authorising the holder to engage in fishing in any area of the fishery limits other than the Mouchoir Bank for the purposes of a sports fishing event or tournament, within the meaning of regulation 21, for such quantities and such species of marine products as may be specified in the licence;
- (m) A Tournament Fishing Vessel License: authorising the use of a particular vessel in any area of the fishery limits other than the Mouchoir Bank by the holder of a Tournament Fishing Licence for the purposes of a sports fishing event or tournament.

7. (1) The authority for the issue or renewal of a licence issued under regulations 6(1)(a) to 6(1)(f) shall be the Governor.

Application for
and issue of
licences

(2) The authority for the issue or renewal of a licence issued under regulations 6(1)(g) to 6(1)(m) shall be the Minister or any person authorised by him in that behalf in the form set out in Schedule 2: Provided that in the case of the refusal to issue or renew a licence by a person authorised to issue licences on behalf of the Minister, the applicant may require that the application be referred to the Minister who, after hearing the applicant, may confirm the refusal or may authorise the issue or renewal of the licence as the circumstances appear to him to require.

- (3) (a) An application for the issue or renewal of a licence under these Regulations, other than an application for the issue or renewal of a Tournament Fishing Licence or a Tournament Fishing Vessel Licence, shall be made to the issuing authority in the form set out in Schedule 1.

- (b) An application for the issue or renewal of a Tournament Fishing Licence or a Tournament Fishing Vessel Licence shall be made to the issuing authority in such form and contain such information as the issuing authority may direct.
 - (c) Any person who completes an application for the issue or renewal of a licence under these Regulations and presents the application to the issuing authority or a person authorised to receive the application on behalf of the issuing authority knowing the same to be false in a material particular shall be guilty of an offence.
- (4)
 - (a) Save as hereinafter provided in regulation 8, a licence granted by the Governor shall, unless previously suspended or revoked or specifically endorsed for a shorter or longer period be valid from the date of issue to the 31st day of July next.
 - (b) Save as hereinafter provided in regulation 8, a licence granted by the Governor shall be in the form set out in Schedule 2 subject to such additional or amending conditions including the payment of fees or royalties as the Governor may consider desirable.
- (5)
 - (a) A licence granted by or on behalf of the Minister shall, unless previously suspended or revoked be valid from the date of issue to the 31st day of July next.
 - (b) Subject to paragraph (c), a licence granted by or on behalf of the Minister shall be in the form set out in Schedule 2 and may be issued or renewed on payment of the relevant fee for that category of licence set out in Schedule 3 provided always that where the licence (other than a licence issued under regulation 6(1) (h), (l) or (m)) is issued on or after the 1st day of February in any year the fee payable shall be one half of the fee for that category of licence specified in the said Schedule.
 - (c) A Tournament Fishing Licence or a Tournament Fishing Vessel Licence granted by or on behalf of the Minister shall be in such form as the Minister may direct.
- (6) The granting of a licence for the processing or exporting of any species of marine product, the name of the licensee and the terms and duration of the licence shall be notified by Government Notice, and a copy of the *Gazette* containing the same shall be sufficient evidence thereof for all purposes.
- (7) The revocation of a licence, giving the name of the licensee and the type of licence, may be notified by Government Notice and a copy

of the *Gazette* containing the same shall be sufficient evidence thereof for all purposes.

(8) A licence shall not be assignable without the consent of the issuing authority and the issue assignment or renewal of a licence in any particular case shall be in the discretion of the issuing authority.

(9) Save as otherwise expressly provided in the licence there shall be implied in each licence granted under these Regulations the terms set out in the relevant parts of Schedule 4.

(10) No licence shall be deemed to permit fishing or the taking of any marine product in any prohibited area or by the use of any prohibited apparatus or method: provided always that the Governor may by Order published in the *Gazette* exempt the holder of any Scientific and Research Licence issued under regulation 6 (1)(d) from any of these Regulations.

8. (1) The Governor may enter into an Access Agreement with other states and with associations representing foreign fishing vessel owners or charterers providing for the allocation of fishing rights to the vessels from those states or associations.

Access
Agreements

(2) An Access Agreement shall include a licence pursuant to regulation 6(1)(e) in such form and on such terms as the Governor may determine licensing the vessels referred to in the Agreement together with their crew to engage in commercial fishing in such parts of the fishery limits as the Agreement shall set out.

(3) The fishery rights allocated under an Access Agreement shall not exceed the total resources or amount of fishing allocated for fishing under Access Agreements in any fishery plan for the time being approved by the Governor.

(4) Any Agreement entered into under this regulation shall include a provision establishing the responsibility of the foreign state or association to take necessary measures to ensure compliance by its vessels and crew with the terms and conditions of the Agreement and with the fishery laws of the Turks and Caicos Islands.

(5) For the purpose of this regulation “state” shall include any regional organisation to which the power to negotiate Access Agreements has been delegated by the member countries.

PART III

CONSERVATION PROVISIONS

9. (1) No person shall—

(a) save as hereinafter provided, use or suffer to explode or escape any explosive, poison, or any noxious substance

Restrictions on
means of taking
marine products
and harmful
activities

within the fishery limits and whether or not with the intent to take any marine product: provided that a person in lawful possession of a bang stick shall not commit an offence if he proves, the onus being upon him, that he used the same to protect himself or another person or any property against any marine product of a dangerous nature which attacked him, that other person or that property and provided also that a person using an explosive or noxious substance under and in accordance with an endorsement on a licence made pursuant to regulation 10 shall not commit an offence;

- (b) possess any noxious substance being bleach or other substance containing or comprising sodium hypochlorite or chlorine or dogwood or quick lime within the fishery limits with intent to take any marine product;
- (c) use scuba equipment or any artificial breathing device other than a snorkel when taking marine products: provided always that this paragraph shall not prohibit the use of scuba equipment or any artificial breathing device when taking marine products by the holder of any licence issued under these Regulations which is specifically endorsed for that purpose;
- (d) use a spear gun or Hawaiian sling for the taking of marine products anywhere within the fishery limits: provided that a person shall not commit an offence if he proves, the onus being on him, that he used a Hawaiian sling to protect himself or another person or any property against any marine product of a dangerous nature which attacked him, that other person or that property;
- (e) use any net or trap with intent to take any species of marine product in any part of the area known as Bell Sound and bounded on the North by a line running in an easterly direction from Horse Cay to Sail Rock Point.

(2) Any person who contravenes any provision of this regulation shall be guilty of an offence and shall be liable on conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment.

Restrictions
relating to sea
bed

10. (1) No person shall, except with the express endorsement of the Governor on a licence issued under these Regulations or on any other licence issued by the Governor and subject to such conditions including monetary payment as the Governor may impose, use any explosive, noxious or other substance or any device or thing potentially harmful to marine life to remove, dissolve, shift or in any way disturb any coral, sea oats, sand, rock or other substance forming part of the sea bed or any wreck within the fishery limits.

(2) Any person who contravenes any provision of this regulation shall be guilty of an offence.

11. (1) It shall be unlawful for any person to have in his possession or purchase any marine product which has been taken by the use of a spear gun or Hawaiian sling.

Prohibition on
spear guns and
Hawaiian slings

(2) It shall be unlawful for any person to have a spear gun in his possession on or within fifty feet of any tidal water or upon any beach or foreshore or while swimming or while in any vessel.

(3) A person who contravenes any provision of this regulation commits an offence and is liable on conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment.

12. (1) The close season in relation to crawfish shall be the period from the first day of April to the thirty-first day of July (inclusive) in each year or such other dates as may, from time to time, be appointed by the Governor in the *Gazette*.

Close season

(2) Without prejudice to paragraph (1), the Governor may, by notice in the *Gazette*, appoint any period to be a close season for any particular species of marine product, either generally or in any particular area or areas.

(3) (a) Any person who takes any marine product during a period which is a close season for that species of marine product shall be guilty of an offence.

(b) Any person who purchases or is in possession of any marine product during a period which is a close season for that species of marine product shall be guilty of an offence unless he proves, the onus being on him, that the said marine product was not taken during the close season or that he did not know and had no reason to believe that the said marine product was so taken.

(4) Where, in any year, the first day of April falls upon a Good Friday or on a Sunday, the “close season” in relation to crawfish shall, in that year, commence on the thirty-first day of March.

(5) Where, in any year, the first day of August falls upon a Sunday, the “close season” in relation to crawfish shall end at midnight on that day instead of on the thirty-first day of July.

13. (1) The Minister may, by notice in the *Gazette*, declare any area to be a prohibited area—

Prohibited areas

(a) for the taking of any particular or all species of marine products or for the depositing of any conch shells or any other matter whatsoever; or

- (b) for the taking of any particular or all species of marine products by particular means; or
- (c) into which a vessel licensed under regulation 6 shall not enter.

(2) Any person who fails to comply with the requirement of any notice published under the provisions of paragraph (1) shall be guilty of an offence.

Legal size

14. (1) Any person who takes or is in possession of or sells any marine product smaller than the legal size shall be guilty of an offence: provided that a person shall not commit an offence under this regulation if having inadvertently taken any marine product which is undersize, he forthwith returns the same to the water unharmed.

(2) For the purpose of this regulation the legal size means, in relation to—

(a) Crawfish

- (i) when whole, a length of 3.75 inches measured from the front of the groove between the horns directly above the eyes along the middle of the back to the rear edge of the carapace or back shell; or
- (ii) when the tail has been separated, a tail weight of 7 ounces whether processed or not.

(b) Conch

- (i) a minimum shell length of 7 inches measured from the spiral tip to the foremost edge; and
- (ii) a conch meat, when removed from the shell, of a total weight of 8 ounces after the removal of the digestive gland.

(c) Turtles

- (i) Hawksbill Turtle (*Eretmochelys imbricata*) a shell measurement of 20 inches in length measured from the neck scales to the tail piece and a weight of at least 20 lbs;
 - (ii) Green Turtle (*Chelonia mydas*) a shell measurement of twenty inches in length measured from the neck scales to the tail piece and a weight of at least 20 lbs;
 - (iii) Any other turtle, a weight of at least 20 lbs.
- (d) Any other species of marine product such size as the Minister may prescribe from time to time by order published in the *Gazette*.

Notwithstanding the provisions of paragraph (1), it shall not be an offence under this regulation for a person who is the holder of a Commercial Fisherman's Licence for the purpose of engaging in the mariculture of conch to take or be in possession for that purpose of conch which is smaller than the legal size.

(3) The master of any vessel engaged in fishing for crawfish, conch or turtle who fails to carry a measuring gauge aboard the vessel shall be guilty of an offence.

15. (1) No person shall—

Restrictions
relating to
crawfish

- (a) take any crawfish by use of any hook or other device the use of which may reasonably be expected to wound or kill the crawfish or prevent it being returned to the sea alive and unharmed or be in possession of any crawfish apparently taken in contravention of the preceding provisions of this paragraph: provided that it shall not be an offence to take crawfish, or be in possession of crawfish taken, other than those specified in paragraphs (b), (c), or (d) by means of a hook, from the date hereof until the 31st March 1990 inclusive;
- (b) be in possession of any egg-bearing crawfish;
- (c) strip or in any manner molest any egg-bearing crawfish in order to remove the eggs;
- (d) take or be in possession of any moulting or soft-shelled crawfish or crawfish which is in the early stage of spawning (when described as appearing to be tar-spotted).

(2) Any person finding any egg-bearing crawfish or any crawfish which is otherwise prohibited to be taken, in any trap which he operates shall forthwith return such crawfish to the water unharmed.

(3) Any person taking crawfish shall ensure that the crawfish remain in whole condition after being taken until landed at that place in the Islands where they are to be sold, processed or used for personal consumption or for consumption in the home unless they are to be processed at sea in accordance with the terms of a processing licence.

(4) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

16. (1) No person shall take, have in his possession, buy or sell any of the following sponges that have less than the following minimum measurements when removed from the sea:

Restrictions
relating to
sponges

- (a) wool sponge – 5½ inches;
- (b) grass sponge – 5½ inches;

(c) hard head sponge – 3 inches;

(d) reef sponge – 3 inches.

(2) No person shall, without the written consent of the Minister, export sponge for commercial purposes unless:

(a) the sponge is clipped, graded and packaged; and

(b) the sponge is presented to a Fishery Officer prior to exportation.

(3) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

Restrictions
relating to turtles

17. (1) No person shall—

(a) take any turtle on any beach or at any place above low water mark;

(b) take or be in possession of or offer to buy or sell, any laid turtle eggs.

(2) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

Restrictions
relating to
marine mammals

18. No person shall engage in fishing for, molest or otherwise interfere with any marine mammal.

Fish pots and
traps

19. (1) No person shall use a wire mesh to trap fish within the fishery limits unless the wire mesh has the following minimum size:

(a) in the case of a hexagonal wire mesh 1½ inches (greatest length of mesh); or

(b) in the case of welded or woven rectangular wire mesh 1 inch by 2 inches.

(2) No person shall use a trap to take or attempt to take marine products within the fishery limits, unless the trap contains a panel that would, after use in water for continuous period of not more than six weeks, deteriorate to an extent that any marine product within the trap could exit from the trap.

(3) Any person using pots or traps for the purpose of taking marine products shall identify his pots or traps by marking them conspicuously with the number of the Commercial Fisherman's Licence which he holds.

(4) No person shall, without lawful excuse, handle, touch or in any way interfere with any pot or trap of another person.

(5) No person shall leave his pots or traps in the water unattended or unexamined for a period exceeding forty-eight hours from the time of placing the same in the water: provided that such time shall be extended during such period as the weather conditions prevent the removal or examination of such pots or traps.

(6) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

20. Any person who for the purpose of taking any marine product uses a net (other than a net used for landing or holding marine products caught by other means) with a mesh size smaller than the minimum mesh size for the time being prescribed by the Minister for that type of net by Order published in the *Gazette* shall be guilty of an offence.

Nets

21. (1) No person shall, without the prior written approval of the Minister, upon such terms and conditions including the payment of a fee as the Minister may determine, organise or hold a sports fishing event or tournament.

Sports fishing
tournament

(2) For the purpose of this regulation a sports fishing event or tournament shall mean any fishing competition involving three or more fishing vessels for which an entry fee is paid or prizes are given.

(3) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

22. (1) The holder of a Commercial Fisherman's Licence issued under regulation 6(1)(g) shall not without the prior consent of the Minister in writing in the form set out in Schedule 2 or in such other written form as the Minister shall from time to time determine:

Employment
restrictions in
commercial
fishing

- (a) allow any person who is not the holder of a commercial fisherman's licence to assist him in any commercial fishing; or
- (b) receive from any person who is not the holder of a Commercial Fisherman's licence any marine product for sale or disposal for reward; or
- (c) share the profits of any commercial fishing with any person who is not the holder of a Commercial Fisherman's licence.

(2) The holder of a Commercial Fishing Vessel Licence or a Sports Fishing Charter Vessel Licence shall not without the prior consent of the Minister in writing allow the particular vessel to be used for commercial fishing or for sports fishing for hire or other reward unless there is a Belonger aboard the vessel at all material times.

(3) A person who contravenes this regulation shall be guilty of an offence and shall be liable on summary conviction to a fine of \$50,000 or to imprisonment for twelve months or to both such fine and imprisonment.

23. (1) No person shall purchase any species of marine product, whether for processing or consumption by himself or by any other person, from any person who is not the holder of a commercial fisherman's licence or, in the case of any such marine product which has been processed in the

Restriction on
purchase and
sale of marine
products

Islands, of a licence to process that species of marine product: provided that this paragraph shall not apply to the purchase from a hotel, restaurant, shop or other similar commercial establishment of any marine product previously purchased from the holder of a commercial fisherman's licence or a licence to process that species of marine product.

(2) Any person who purchases any marine product in contravention of the provisions of paragraph (1) and any person who, not being the holder of a commercial fisherman's licence, or a licence to process that species of marine product, sells or offers or exposes for sale any marine product, shall each be guilty of an offence: provided that this paragraph shall not apply to the sale by a hotel, restaurant, shop or similar commercial establishment, of any marine product previously purchased from the holder of a Commercial Fisherman's Licence or a licence to process that species of marine product.

(3) The owner or operator of every hotel, restaurant, shop or similar commercial establishment who purchases or sells crawfish shall upon a request made to him by the Minister in writing submit to the Minister an accurate statement as to the quantity in weight of crawfish, frozen or otherwise, in his possession at the date of the statement within 14 days of the request.

(4) The owner or operator of a hotel, restaurant, shop or similar commercial establishment who fails to submit to the Minister an accurate statement in accordance with paragraph (3) shall be guilty of an offence.

Storage of gear

24. (1) At any time when a vessel is within the fishery limits all fishing equipment on board such vessel shall be stored in such a manner so as not to be readily available for use for fishing: provided always that this paragraph shall not apply to a vessel which is licensed under these Regulations and is at the material time otherwise being used in conformity with the terms of that licence and these Regulations.

(2) Where any vessel is used in contravention of paragraph (1) the master of the vessel shall be guilty of an offence.

Transhipment of
catch

25. (1) The transhipment of any marine product from one vessel to another within the fishery limits is prohibited unless the licences of the vessel from which the marine product is transhipped and the vessel which receives the marine product contain an endorsement permitting transhipment: provided always that this paragraph shall not apply in the case of marine products transhipped from a vessel's boat or dinghy to the vessel.

(2) Where any transhipment takes place in contravention of paragraph (1) the master of each of the vessels concerned shall be guilty of an offence: provided that it shall be a defence for a person charged with an offence under this regulation to prove that the marine product transhipped was not taken in the fishery limits.

PART IV

FISH AGGREGATING DEVICES

26. (1) No person shall place any fish aggregating device in the fishery limits without the express written permission of the Minister and in accordance with the terms of such permission: provided always that this paragraph shall not apply to vessels and their crew operating under an Access Agreement where the Agreement makes specific provision for fish aggregating devices.

Fish aggregating
device

(2) Any application for permission to place a fish aggregating device shall be made to the Minister in writing specifying the intended location and the nature of the device.

(3) On consideration of any application under this regulation the Minister may either grant or refuse such permission or may grant permission for such term and subject to such conditions, including the payment of a fee, as he may think fit.

(4) The Governor may, by notice published in the *Gazette*, declare any fish aggregating device for the placement of which permission has been granted by the Minister to be a “designated fish aggregating device”.

(5) No person other than the person to whom permission to place the device has been given, may fish within a radius of one half of a nautical mile of a designated fish aggregating device, without the written permission of the Minister.

(6) Any fish aggregating device placed in the fishery limits shall be at all times:

- (a) clearly marked with the name of the vessel from which it is placed;
- (b) equipped with radar reflector and lights visible at night from a distance of at least five miles;
- (c) equipped with such equipment and marked in such manner as may be prescribed by the Minister.

(7) Any person who contravenes the provisions of this regulation shall be guilty of an offence.

PART V

FISHERIES MANAGEMENT AND DEVELOPMENT

27. (1) There shall be a Fishery Advisory Committee consisting of the Chief Fishery Officer who shall be chairman and up to six other members appointed by the Governor by notice published in the *Gazette*.

Fishery Advisory
Committee

(2) Appointed members of the Fishery Advisory Committee shall hold office for such period not exceeding three years as may be specified in their notice of appointment.

(3) The functions of the Fishery Advisory Committee shall be to advise the Governor or the Minister (as the case may be) on the exercise of their respective functions under the Fisheries Protection Ordinance and these Regulations and as to the management and development of fisheries.

Fishery plan

28. (1) The Fishery Advisory Committee shall prepare and keep under review a plan for the management and development of fisheries.

(2) The Fishery plan shall:

- (a) identify each fishery and assess the present state of its exploitation;
- (b) specify the objectives to be achieved in the management of each fishery;
- (c) specify the management and development measures to be taken; and
- (d) specify the licensing programmes to be followed for each fishery, the limitations, if any, to be applied to local fishing operations and the amount of fishing, if any, to be allocated to vessels under Access Agreements.

(3) In the preparation and review of the Fishery plan, the Fishery Advisory Committee shall consult with fishermen resident in the Turks and Caicos Islands, wholesalers, retailers, exporters and importers of marine products, and other bodies or persons affected by the Fishery plan.

(4) The Fishery plan and each review thereof shall be submitted to the Governor for approval.

PART VI

ENFORCEMENT

Powers of
fishery officer
Cap. 105

29. Without prejudice to any other powers conferred upon a fishery officer by these Regulations, the Fishery Limits (Turks and Caicos Islands) Ordinance or any other law for the time being in force, for the purpose of preventing the commission of offences under these Regulations and the apprehension of persons committing any such offences, a fishery officer shall be deemed to have the powers of a police officer.

Search warrants

30. (1) If the Magistrate or a Justice of the Peace is satisfied by complaint made on oath that there are reasonable grounds for suspecting that an offence against these Regulations has been, is being or is about to be committed and that evidence of the commission or intended commission of

such an offence is to be found at any premises or in any vessel specified in such complaint, he may grant a search warrant authorising a fishery officer, together with any other person named in the warrant, to search such premises or vessel at any time within one month from the date of the warrant, using such force as may be reasonably necessary if entry to such premises or vessel is refused or cannot otherwise be obtained.

(2) Any person acting under the authority of a search warrant issued in pursuance of this regulation may search any person who is found in or on, or whom he has reasonable grounds for believing has recently left or is about to enter such premises or vessel, as the case may be, and may seize any marine products or apparatus found in such premises or vessel, or upon such person, which he has reasonable grounds for believing to be evidence of the commission or intended commission of any offence under these Regulations: provided that a female shall only be searched by a female.

(3) A fishery officer may at any time with or without a warrant issued under this regulation lift, raise or draw from the water any pot or trap with its contents (if any) for the purpose of inspecting the same.

(4) Any person who obstructs the exercise of the powers conferred by a search warrant issued in pursuance of this regulation shall be guilty of an offence.

31. (1) Where a fishery officer has reasonable cause to suspect that any vessel, gear or apparatus (of whatsoever kind) has been used in connection with the commission of any offence under these Regulations, he may seize such vessel, gear or apparatus, as the case may be, and hold the same until the determination of the proceedings in respect of that offence, unless the Magistrate on application made by the owner thereof, shall otherwise direct: provided that if proceedings in respect of such suspected offence are not brought within one month of such seizure the fishery officer shall forthwith release any thing so seized.

Seizure of
vessels, gear etc

(2) Where a fishery officer has reasonable cause to suspect that any marine product has been taken in contravention of these Regulations and he proposes to bring proceedings for an offence he may seize and hold the same until such proceedings, but such marine product, if of a perishable nature, may be disposed of or otherwise dealt with prior to the determination of such proceedings in such manner as the Magistrate upon the application of the fishery officer or of the person against whom the proceedings are to be brought, may direct.

(3) Any person who wilfully destroys or attempts to destroy anything to prevent its seizure under the foregoing provisions of this regulation shall be guilty of an offence.

32. (1) Where a fishery officer has reasonable cause to suspect that a vessel has been is being or is about to be used for fishing he may require

Production of
licences

the owner or the master of that vessel to produce the relevant fishing licence issued in respect of the vessel.

(2) Where a fishery officer has reasonable cause to suspect that a person has been is being or is about to be engaged in commercial fishing he may require that person to produce his commercial fisherman's licence.

(3) Where a fishery officer has reasonable cause to suspect that any non Belonger has been is being or is about to be engaged in fishing he may require that person to produce his Sports Fishing Licence.

(4) Any person who is requested by a fishery officer acting in accordance with the provisions of paragraphs (1), (2) or (3) to produce a licence issued under these Regulations and who fails without due cause to produce the licence either to the officer or to the nearest police station within twelve hours shall be guilty of an offence.

Forfeiture upon
conviction

33. (1) Upon the conviction of any person for an offence against regulation 5(1), 9, 12 or 22 of these Regulations, the Court shall order the forfeiture to the Government of any property (including any vessel) seized under regulation 31 in connection with that offence.

(2) Upon the conviction of any person for an offence against any regulation other than a regulation referred to in paragraph (1) the Court may order the forfeiture to the Government of any property (including any vessel) seized under regulation 31 in connection with that offence.

(3) Where any property is forfeited pursuant to paragraph (1) or (2) the Governor in Council shall determine the manner in which that property shall be disposed of and may give directions in relation to such disposal.

(4) Where, under the provisions of paragraph (1) or (2) a person's property is forfeited, any licence that person may hold issued under regulation 6 shall be void and of no further effect.

Evidence

34. (1) Where any marine product is found upon any vessel—

(a) all persons found aboard that vessel shall be deemed to be in possession of that product; and

(b) that product shall, unless the contrary is proved, be deemed to have been taken within the fishery limits.

(2) Where any apparatus or equipment is found aboard any vessel that has been used in contravention of these Regulations all persons found aboard that vessel shall be deemed to have used the apparatus or equipment, unless the contrary be proved.

(3) Where any marine product is found upon any vessel and any bleach, or other substance containing or comprising sodium hypochlorite, chlorine, dogwood or quicklime, or spear gun, Hawaiian sling, scuba

equipment or artificial breathing device is also found aboard that vessel—

- (a) that marine product shall be deemed unless the contrary is proved, to have been taken by the use of that bleach or other substance containing or comprising sodium hypochlorite, chlorine, dogwood or quicklime, or spear gun, Hawaiian sling, scuba equipment or artificial breathing device (as the case may be) and;
- (b) every person found aboard that vessel shall be deemed, unless the contrary is proved, to have been in possession at all relevant times of the bleach, or other substance containing or comprising sodium hypochlorite, chlorine, dogwood or quicklime, or spear gun, Hawaiian sling, scuba equipment or artificial breathing device (as the case may be).

(4) Where any noxious substance being bleach or other substance containing or comprising sodium hypochlorite, chlorine, dogwood or quicklime is found upon any vessel it shall be deemed, unless the contrary is proved, that it was intended to be used for the purpose of taking marine products, contrary to the provisions of regulation 9(1)(b).

(5) Where any marine product bears any mark or wound consistent with the same having been taken by use of a spear gun or Hawaiian sling the same, unless the contrary be proved, shall be deemed to have been so taken.

35. Any person who damages or interferes in any way, except for just and sufficient cause, with any vessel, gear or equipment (of whatsoever kind) used by any fishery officer for the purpose of carrying out his duties in the enforcement of the provisions of these Regulations, shall be guilty of an offence and shall be liable on summary conviction to a fine of \$50,000 or to imprisonment for twelve months, or to both such fine and imprisonment.

Interfering with
fishery
protection
equipment

36. (1) All offences under these Regulations shall be triable summarily.

Trial and
penalties

(2) Any person convicted of an offence for which no other penalty is provided under these Regulations shall be liable on conviction to a fine of \$5,000 or to imprisonment for six months, or to both such fine and imprisonment.

37. (1) Where any person is convicted of an offence under these Regulations the Court may recommend that any person who has furnished evidence or information leading to the conviction shall receive a reward.

Rewards

(2) Where a recommendation is made under paragraph (1) the Minister shall forward the recommendation to the Governor for consideration.

Naval personnel
deemed to be
fishery officers

38. For the purposes of the enforcement or intended enforcement of these Regulations all officers and men of Her Majesty's naval forces shall be deemed to be fishery officers.

SCHEDULE I

PRESCRIBED FORMS

(Regulation 7)

FORM A 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FORM FOR A MOUCHOIR BANK LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office, if different.
- (c) Continue answers on separate sheets as necessary and sign and date **all** such separate sheets.
- (d) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE OF A MOUCHOIR BANK LICENCE UNDER REGULATION 6(1)(a) OF THE FISHERIES PROTECTION REGULATIONS.

- 1. Name and address of applicant
.....
- 2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members and/or place and date of registration (as the case may be):
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
- 3. Details of vessel(s) to be used by the applicant.
 - (a) Name of vessel(s)
 - (b) Turks and Caicos Islands Fishing Vessel Licence Number(s)
.....

4. Has the applicant or any shareholder, director, partner or member ever been convicted of an offence under the Fisheries Laws of the Turks and Caicos Islands or of any other country? If so, please give full details

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed:

Date:

FORM B 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR A PROCESSING OR EXPORT LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheet as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE TO ME/US OF A CLASS A PROCESSING LICENCE/CLASS B PROCESSING LICENCE/EXPORT LICENCE UNDER REGULATION 6(1),(b) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and address of applicant
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and address of all shareholders, partners or members and/or place and date of registration (as the case may be):

- (i)
- (ii)
- (iii)
- (iv)
- (v)
- 3. The applicant intends to engage in processing and/or exporting of marine products (delete as necessary) in or from premises at
- 4. (a) Species of marine products to be processed
- (b) Species of marine products to be exported
- 5. Source of supply for marine products to be exported/processed
- 6. Nature of processing operation (give full details to include details of all processing and freezing equipment).....
- 7. Anticipated quantities of marine product to be processed/exported
- 8. (a) Principal place of marketing of processed marine products
- (b) Principal destination for export of marine products
- 9. Period of Licence requested
- 10. Details of fishing licences held by the applicant in any country outside Turks and Caicos Islands
- 11. Has the applicant or any shareholder, director, partner or member ever been convicted of an offence under the Fisheries Laws of the Turks and Caicos Islands or any other country. If so please give full details.
.....
.....
.....
.....

12. Other Information:

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM C 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR AQUARIUM COLLECTING LICENCE

Instruction to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheet as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE TO ME/US OF AN AQUARIUM COLLECTING LICENCE UNDER REGULATION 6(1) (c) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and address of applicant
.....
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members and/or place and date of registration (as the case may be):

- (i)
- (ii)
- (iii)
- (iv)
- (v)
- 3. Number and species of marine products to be collected
- 4. Nature of collecting operation and means of and premises for storage
of catch alive
- 5. Means of export of live catch
- 6. Principal place or country for export of live catch
- 7. Period of Licence requested
- 8. Details of fishing licences held by the applicant in any country
outside Turks and Caicos Islands
- 9. Is scuba gear to be used? If so give details
- 10. Other Information:

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM D 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR A SCIENTIFIC AND RESEARCH LICENCE**Instructions to Applicant.**

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheet as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE TO ME/US OF A SCIENTIFIC AND RESEARCH LICENCE UNDER REGULATION 6 (1) (d) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and address of applicant
.....
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and address of all shareholders, partners or members and/or place and date of registration (as the case may be):
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
3. The applicant intends to engage in scientific research and/or exporting of marine products (delete as necessary) in or from premises at
.....
4. (a) Species and types of marine product to be obtained
.....
(b) Species and types of marine product to be exported
.....
5. Source of supply for marine product to be obtained/exported
.....

6. Nature of scientific and research operations (give full details)
.....
.....
7. Anticipated quantities of marine product to be obtained/exported
.....
8. Principal destination for export or marine products
.....
9. Period of Licence requested
10. Details of fishing licences held by the applicant in any country
outside the Turks and Caicos Islands
.....
11. Has the applicant or any shareholder, director, partner or member ever
been convicted of an offence under the Fisheries Laws of the Turks
and Caicos Islands or any other country? If so, please give full details.

.....
.....
.....

FORM F 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR A CORAL LICENCE

Instructions to Applicant.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheet as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE TO ME/US OF A CORAL
LICENCE UNDER REGULATION 6 (1)(f) OF THE FISHERIES PRO-
TECTION REGULATIONS.

1. Name and address of applicant
-

2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and address of all shareholders, partners or members and/or place and date of registration (as the case may be):
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
3. The applicant intends to engage in processing and/or exporting of coral (delete as necessary) in or from premises at
4. (a) Species and types of coral to be processed
- (b) Species and types of coral to be exported
5. Source of supply for coral to be processed/exported
6. Nature of processing operation (give full details to include details of processing equipment)
7. Anticipated quantities of coral to be processed/exported
8. (a) Principal place of marketing of coral
- (b) Principal destination for export of coral
9. Period of Licence requested
10. Details of fishing licences held by the applicant in any country outside Turks and Caicos Islands
11. Has the applicant or any shareholder, director, partner or member ever been convicted of an offence under the Fisheries Laws of Turks and Caicos Islands or any other country? If so, please give full details

12 Other Information:

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM G 1

FISHERIES PROTECTION REGULATIONS

**APPLICATION FORM FOR A
COMMERCIAL FISHERMAN'S LICENCE**

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office, if different.
- (c) Continue answers on separate sheets as necessary and sign and date **all** such separate sheets.
- (d) Submit application in duplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I HEREBY APPLY FOR THE ISSUE OF A COMMERCIAL FISHERMAN'S LICENCE UNDER REGULATION 6(1)(g) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and address of applicant
.....
.....
2. Nationality of applicant
.....
3. Details of previous or other fishing licences held by the applicant in the Turks and Caicos Islands
.....
.....

4. Has the applicant ever been convicted of an offence under the Fisheries Laws of the Turks and Caicos Islands or of any other country? If so, please give full details
-
-
5. Other Information:

Declaration by applicant.

I declare that I am a Belonger of the Turks and Caicos Islands as defined in the Fisheries Protection Regulations and that the information given in this application is true to the best of my knowledge and belief. I understand that I am to report any changes in the information given in this application to the Chief Fisheries Officer within seven days of the change and that if any information given herein is incorrect in any material particular, this application may be cancelled.

Signed: Date:

FORM H 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FORM FOR A SPORTS FISHING LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office, if different.
- (c) Continue answers on separate sheets as necessary and sign and date **all** such separate sheets.
- (d) Submit application in duplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I HEREBY APPLY FOR THE ISSUE OF A SPORTS FISHING LICENCE UNDER REGULATION 6(1)(h) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and address of applicant
2. Nationality and passport number of applicant:
3. *(To be answered by applicants who are residents but not Belongers)*
 - (a) Work permit number/or date and place of application for work permit
 - (b) Permanent residence certificate number/or date and place of application for permanent residence certificate
4. Has the applicant ever been convicted of an offence under the Fisheries Laws of the Turks and Caicos Islands or of any other country? If so, please give full details
5. Other Information:

Declaration by applicant.

I declare that the information given in this application is true to the best of my knowledge and belief.

Signed: Date:

FORM I 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR COMMERCIAL FISHING VESSEL LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.

- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheets as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE OF A COMMERCIAL FISHING VESSEL LICENCE UNDER REGULATION 6(1)(i) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name, address and nationality of applicant (who must be the owner)
.....
.....
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members/date and place of registration (as the case may be):
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
3. Name of vessel
4. Country and Port of Registry of vessel and registered number
.....
5. Gross tonnage of vessel (if more than 1 ton)
6. Overall length of vessel
7. Details of radio equipment fitted:
 - Frequencies No. of channels
 - Call sign
8. Operation base for vessel (port or country)
9. Name and address of master (*if not either owner or applicant*)
.....
10. Proposed fishing area
11. Type of fishing operations
12. Details of gear fitted to vessel
13. Number of crew normally carried

(Questions 14–23 to be completed where the application relates to a vessel in excess of 20 feet overall length)

14. Normal number of crew
15. Details of crew accommodation
16. Hull material and colour
17. Year built
18. Place of construction
19. Fuel capacity
20. Daily freezing capacity
21. Storage capacity
22. Safety/life saving equipment carried
23. Recent photograph of vessel attached (*affix below*)
24. Details of fishing licences held by the applicant in the Turks and
Caicos Islands or any other country
.....
.....
25. Has the owner or applicant or any shareholder, director, partner or
member ever been convicted of an offence under the Fisheries Laws
of the Turks and Caicos Islands or of any other country? If so, please
give full details.
.....
.....

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM J 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR SPORTS FISHING VESSEL LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurement if not metric.
- (d) Continue answers on separate sheets as necessary and sign and date all such separate sheets.
- (e) Submit application in triplicate, to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE OF A SPORTS FISHING VESSEL LICENCE UNDER REGULATION 6(1)(j) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name and nationality of applicant
.....
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members/and the date and place of registration (as the case may be)
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
3. Address
(if not resident give temporary address in Turks and Caicos Islands).
4. Name, address and nationality of owner (if different to applicant)
.....
.....
5. Name of vessel
6. Port of registry of vessel and registered number
.....
7. Type and make of vessel

8. Size, gross tonnage and overall length of vessel
9. Type and description of fishing gear to be used in sport fishing
10. *(If not resident in Turks and Caicos Islands)* Length of stay in Turks and Caicos Islands
11. Details of radio equipment fitted:

Frequencies	No. of Channels
Call sign	
12. Proposed fishing area
13. Name and address of master
14. If stay exceeding two months attach recent photograph of vessel
15. Period of licence requested
16. Details of any previous licence issued to the applicant under the Fisheries Protection Regulations
17. Details of any fishing licence held by the applicant in any country outside the Turks and Caicos Islands
18. Has the applicant or any shareholder, director, partner or member ever been convicted of an offence under the Fisheries Laws of the Turks and Caicos Islands or of any other country? If so, please give full details
19. Other Information:

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM K 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR AN ORDINARY FISHING VESSEL LICENCE

Instructions to Applicants.

- (a) Complete all items in full and in ink. Do not leave any blanks. If not applicable write N/A.
- (b) Provide full mailing address and address or place of business or registered office if different.
- (c) Specify units of measurements if not metric.
- (d) Continue answers on separate sheets as necessary and sign and date **all** such separate sheets.
- (e) Submit application in triplicate to the Minister of Natural Resources, Grand Turk, Turks and Caicos Islands.

I/WE HEREBY APPLY FOR THE ISSUE OF AN ORDINARY FISHING VESSEL LICENCE UNDER REGULATION 6(1)(k) OF THE FISHERIES PROTECTION REGULATIONS.

1. Name, address and nationality of applicant (who must be the owner)
.....
.....
2. If the application is made by or on behalf of a company, partnership or co-operative body, give the names and addresses of all shareholders, partners or members and date and place of registration (as the case may be):
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
3. Name of vessel
4. Country and Port of Registry of vessel and registered number
.....
.....
5. Gross tonnage of vessel (if more than 1 ton)
6. Overall length of vessel
7. Details of radio equipment fitted:
Frequencies No. of channels
Call sign

8. Operation base for vessel (*port or country*)
 9. Name and address of master (*if not either owner or applicant*)
.....
.....
 10. Proposed fishing area
 11. Type of fishing operations
 12. Details of gear fitted to vessel
 13. Number of crew normally carried
- (Questions 14–23 to be completed where the application relates to a vessel in excess of 20 feet overall length)
14. Normal number of crew
 15. Details of crew accommodation
 16. Hull material and colour
 17. Year built
 18. Place of construction
 19. Fuel capacity
 20. Daily freezing capacity
 21. Storage capacity
 22. Safety/life saving equipment carried
 23. Recent photograph of vessel attached (*affix below*)
 24. Details of fishing licences held by the applicant in the Turks and
Caicos Islands or any other country
 25. Has the owner or applicant or any shareholder, director, partner or
member ever been convicted of an offence under the Fisheries Laws
of the Turks and Caicos Islands or of any other country? If so, please
give full details

Declaration by applicant.

I/We hereby declare that the information given in this application is true and complete to the best of my/our knowledge and belief and I/we understand that if any information given herein is incorrect in any material particular, a licence issued on the basis of this application may be cancelled.

Signed: Date:

FORM L 1

FISHERIES PROTECTION REGULATIONS

APPLICATION FOR RENEWAL OF LICENCE

I/We of
hereby apply for the renewal of Licence No.
for the period to 31st July

The application given in my original application for the said licence

- (i) has not changed;*
- (ii) has not changed since the last renewal;*
- (iii) has changed, and details of such changes are given below.*

** delete as appropriate*

I/We hereby declare that the
information given in this application is true and complete to the best of
my/our knowledge and belief and I/we understand that if any information
given herein is incorrect in any material particular, a licence issued on the
basis of this application may be cancelled.

Signed: Date:

SCHEDULE 2**PRESCRIBED FORMS***(Regulations 6 & 7)*

FORM A 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

MOUCHOIR BANK LICENCE*(Reg: 6 (1) (a))*

Licence No: A/

Fee paid: \$

(Receipt No:)

The licence holder named below is hereby licenced to use the vessel(s) named herein for commercial fishing/Sports Fishing Charters within the area of the Mouchoir Bank in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

Name of Licence Holder:

Name of vessel(s):

Fishing Vessel Licence No(s):

Special conditions:

Licence expires the 31st day of July unless renewed (see below)

Issued this day of 19/20

Signed.....

THE GOVERNOR

Renewals: 1. From to 31st July Initials Date.....
 2. From to 31st July Initials Date.....
 3. From to 31st July Initials Date.....
 4. From to 31st July Initials Date.....
 5. From to 31st July Initials Date.....
 6. From to 31st July Initials Date.....
 7. From to 31st July Initials Date.....
 8. From to 31st July Initials Date.....

FORM B 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

PROCESSING OR EXPORT LICENCE

(Reg: 6 (1) (b))

Licence No: B/

Fee paid: \$ (Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(b) of the Fisheries Protection Regulations to use the premises described below for the purposes of a Class A/Class B processing plant (and/or*) to export marine products from the Turks and Caicos Islands, in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

** delete as appropriate.*

Name of Licence Holder:

Licence Period: From: To: 31st July 19/20

Address of Premises:

Species type and quantity of marine products authorised to be processed/
and exported (which shall exclude corals):
.....

Special conditions:

Dated this day of

Signed:

THE GOVERNOR.

FORM C 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

AQUARIUM COLLECTING LICENCE

(Reg: 6 (1)(c))

Licence No: C/

Fee paid: \$ (Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(c) of the Fisheries Protection Regulations to take and export alive the species and quantities of marine product described below for use in an aquarium.

Name of Licence Holder:

Licence Period:

Species and Quantities of marine product authorised to be taken:

.....
.....

Scuba equipment (endorsed/not endorsed):

Special conditions:

Dated this day of

Signed:

THE GOVERNOR

FORM D 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

SCIENTIFIC AND RESEARCH LICENCE

(Reg: 6 (1)(d))

Licence No: D/

Fee Paid: \$

(Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(d) of the Fisheries Protection Regulations to take and/or* process marine products for scientific and research purposes and/or* to export the said marine products from the Turks and Caicos Islands, in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

**delete as appropriate.*

Name of Licence Holder:

Licence Period: From: To: 31st July 19/20

Address of Premises:

Species and quantity of marine product authorised to be taken/processed/
exported:

.....

Type of research authorised to be carried out:

Special conditions/Exemptions:

Dated this day of

Signed:

THE GOVERNOR

FORM F 2
TURKS AND CAICOS ISLANDS
FISHERIES PROTECTION REGULATIONS

CORAL LICENCE

(Reg: 6 (1)(f))

Licence No: F/

Fee Paid: \$ (Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(f) of the Fisheries Protection Regulations to take and/or* process coral and/or* export coral from the Turks and Caicos Islands, in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

**delete as appropriate.*

Name of Licence Holder:

Licence Period: From: To: 31st July 19/20.....

Address of Premises:

Species type and quantity of coral authorised to be processed exported:
.....

Scuba equipment (endorsed/not endorsed):

Special conditions:

Dated this day of

Signed:

THE GOVERNOR.

FORM G 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

COMMERCIAL FISHERMAN'S LICENCE*(Reg: 6 (1) (g))*

Licence No: G/

Fee Paid: \$

(Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(g) of the Fisheries Protection Regulations to engage in commercial fishing within the fishery limits of Turks and Caicos Islands and to sell or offer for sale products taken or obtained by him in accordance with the terms and conditions of this licence subject always to compliance with the Fisheries Protection Regulations.

Name of Licence Holder:

Address:

Licence expires 31st July unless renewed (see below)

Special conditions:

Dated this day of

Signed:

Minister or authorised person.

Renewals: 1. From to 31st July Initials Date.....
 2. From to 31st July Initials Date.....
 3. From to 31st July Initials Date.....
 4. From to 31st July Initials Date.....
 5. From to 31st July Initials Date.....
 6. From to 31st July Initials Date.....
 7. From to 31st July Initials Date.....
 8. From to 31st July Initials Date.....

FORM H 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

SPORTS FISHING LICENCE

(Reg: 6(1) (h))

Licence No: H/

Fee Paid: \$ (Receipt No:)

The licence holder named below is hereby licensed in accordance with Regulation 6(1)(h) of the Fisheries Protection Regulations to engage in Sport Fishing within the fishery limits of the Turks and Caicos Islands in accordance with the terms and conditions of this licence and subject always to compliance with the provisions of the Fisheries Protection Regulations.

Name of Licence Holder:

Address:

Licence expires 31st July unless renewed (see below)

Special conditions:

Issued this day of

Signed:

Minister or authorised person.

Renewals: 1. From to 31st July Initials Date.....
2. From to 31st July Initials Date.....
3. From to 31st July Initials Date.....
4. From to 31st July Initials Date.....
5. From to 31st July Initials Date.....
6. From to 31st July Initials Date.....
7. From to 31st July Initials Date.....
8. From to 31st July Initials Date.....

FORM I 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

COMMERCIAL FISHING VESSEL LICENCE

(Reg: 6 (1)(i))

Licence No: I/

Fee Paid: \$

(Receipt No:)

The vessel named below is hereby licensed in accordance with Regulation 6(1)(i) of the Fisheries Protection Regulations for use for commercial fishing by holders of a Commercial Fisherman's Licence within that part of the fishery limits of the Turks and Caicos Islands set out below in accordance with the terms and conditions of this licence and subject always to compliance with the provisions of the Fisheries Protection Regulations.

Name of vessel:

Vessel Licence number (to be displayed on vessel):

Radio call sign:

Length overall:

Area of fishery limits (not including Mouchoir Bank):

.....

Special conditions:

Licence expires the 31st day of July unless renewed (see below)

Issued this day of

Signed:

Minister or authorised person.

Renewals:	1. From to 31st July Initials Date.....
	2. From to 31st July Initials Date.....
	3. From to 31st July Initials Date.....
	4. From to 31st July Initials Date.....
	5. From to 31st July Initials Date.....
	6. From to 31st July Initials Date.....
	7. From to 31st July Initials Date.....
	8. From to 31st July Initials Date.....

FORM J 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

SPORTS FISHING CHARTER VESSEL LICENCE

(Reg: 6 (1)(j))

Licence No: J/

Fee Paid: \$ (Receipt No:)

The vessel named below is hereby licensed in accordance with Regulation 6(1)(j) of the Fisheries Protection Regulations for use for hire or other reward by persons fishing for sport within that part of the fishery limits of the Turks and Caicos Islands set out below in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

Name of vessel:

Vessel Licence No:

Radio call sign:

Length overall:

Area of fishery limits (not including Mouchoir Bank):

Special conditions:

Licence expires on 31st July unless renewed (see below)

Issued this day of

Signed:

Minister or authorised person.

Renewals: 1. From to 31st July Initials Date.....
2. From to 31st July Initials Date.....
3. From to 31st July Initials Date.....
4. From to 31st July Initials Date.....
5. From to 31st July Initials Date.....
6. From to 31st July Initials Date.....
7. From to 31st July Initials Date.....
8. From to 31st July Initials Date.....

FORM K 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS

ORDINARY FISHING VESSEL LICENCE

(Reg: 6 (1)(k))

Licence No: K/

Fee Paid: \$

(Receipt No:)

The vessel named below is hereby licensed in accordance with Regulation 6(1)(k) of the Fisheries Protection Regulations for use for fishing (other than commercial fishing or for hire and reward by persons fishing for sport) within that part of the fishery limits of the Turks and Caicos Islands set out below in accordance with the terms and conditions of this licence and subject always to compliance with the Fisheries Protection Regulations.

Name of vessel:

Vessel Licence No:

Radio call sign (if any):

Length overall:

Area of fishery limits (not including Mouchoir Bank):

Special conditions:

Licence expires on 31st July unless renewed (see below)

Issued this day of

Signed:

Minister or authorised person.

Renewals: 1. From to 31st July Initials Date.....
 2. From to 31st July Initials Date.....
 3. From to 31st July Initials Date.....
 4. From to 31st July Initials Date.....
 5. From to 31st July Initials Date.....
 6. From to 31st July Initials Date.....
 7. From to 31st July Initials Date.....
 8. From to 31st July Initials Date.....

FORM M 2

TURKS AND CAICOS ISLANDS
FISHERIES PROTECTION REGULATIONS

AUTHORITY TO ISSUE LICENCES

(Reg: 7 (2))

IN EXERCISE of the powers conferred upon me by regulation 7 (2) of the Regulations:

I (Name)

of (Address)

Minister for the time being responsible for fisheries in the Turks and Caicos Islands

DO HEREBY AUTHORISE:

You (Name)

Of (Address)

To issue on my behalf the following licences: (delete as necessary)

- Reg: 6 (1) *(g)* Commercial Fisherman's Licence
 6 (1) *(h)* Visitor's Sports Fishing Licence
 6 (1) *(i)* A Commercial Fishing Vessel Licence
 6 (1) *(j)* A Sports Fishing Charter Vessel Licence
 6 (1) *(k)* An Ordinary Fishing Vessel Licence
 6 (1) *(l)* A Tournament Fishing Licence
 6 (1) *(m)* A Tournament Fishing Vessel Licence

Under and in accordance with the Regulations and to account to me for receipt of the fees paid by the licence holders and to forward to me within 14 days of issue a copy of each licence and each application made.

This Authority shall expire on the day of
19/20 unless previously revoked or renewed.

Dated:

Signed:

Minister.

Renewals: 1. From to 31st July Initials Date.....
 2. From to 31st July Initials Date.....
 3. From to 31st July Initials Date.....
 4. From to 31st July Initials Date.....
 5. From to 31st July Initials Date.....

FORM N 2

TURKS AND CAICOS ISLANDS

FISHERIES PROTECTION REGULATIONS ("THE REGULATIONS")

AUTHORITY TO COMMERCIAL FISHERMAN

(Reg: 22)

IN EXERCISE of the powers conferred upon me by regulation 22 of the Regulations

I (Name)

Of (Address)

Minister for the time being responsible for fisheries in the Turks and Caicos Islands

DO HEREBY AUTHORISE:

You (Name)

Of (Address)

* 1. To allow (name) to assist you in commercial fishing; and/or

* 2. To receive from (name) the marine products referred to below for sale or disposal for reward; and/or

* 3. To share the profits of your commercial fishing with (name)

.....

and/or

* 4. To receive from the holder of a Visitor's Sports Fishing Licence any fish taken aboard the

(name of vessel)

(Sports Fishing Charter Vessel Licence No)

and to sell or otherwise dispose of the said fish for gain so long as you are at the material time employed aboard the said vessel and the said fish are not received as part of or in lieu of your remuneration for the said employment or on behalf of or for the financial benefit of any other person subject always to compliance with this authority and the Fisheries Protection Regulations.

* *Delete as appropriate*

Additional conditions:

This authority shall expire on the day of
19/20 unless previously revoked or renewed.

Dated:

Signed:

Minister.

Renewals: 1. From to 31st July Initials Date.....
 2. From to 31st July Initials Date.....
 3. From to 31st July Initials Date.....
 4. From to 31st July Initials Date.....
 5. From to 31st July Initials Date.....

SCHEDULE 3**LICENCE FEES***(Regulation 7)**(Replaced by L.N. 39/1995)*

TYPE OF LICENCE		ANNUAL FEE (\$)
*1.	Licence G2 (Commercial Fisherman's Licence)	
	Belongers	40.00
	Others	150.00
2.	Licence H2 (Sports Fishing Licence)	
	Residents other than Belongers	30.00
	Visitors	15.00
3.	Licence I2 (Commercial Fishing Vessel Licence)	
	(i) Length not exceeding 20 ft overall—	
	Local	35.00
	Foreign owned	2,000.00
	(ii) Length exceeding 20 ft but Not exceeding 30ft overall—	
	Local	150.00
	Foreign owned	3,000.00
	(iii) Length exceeding 30 ft overall—	
	Local	200.00
	Foreign owned	4,000.00
**4.	Licence J2 (Sports Fishing Charter Vessel Licence)	
	(i) Length not exceeding 20ft overall	200.00
	(ii) Length exceeding 20ft but not exceeding 30ft overall	300.00
	(iii) Length exceeding 30ft overall	500.00
5.	Licence K2 (Ordinary Fishing Vessel Licence)	
	(i) Length not exceeding 20 ft overall—	
	Local	20.00
	Foreign	75.00

	(ii)	Length exceeding 20 ft but not exceeding 30ft overall—	
		Local	40.00
		Foreign	100.00
	(iii)	Length exceeding 30ft overall—	
		Local	60.00
		Foreign	150.00
6.		Tournament Fishing Vessel Licence	
		Per tournament	100.00
7.		Tournament Fishing Licence	
		Per tournament	50.00
8.		Processing or Export Licence	8,000.00
	*	The Minister in his discretion may remit this fee on the grounds of age, poverty or infirmity.	
	**	The Minister may in his discretion remit this fee in whole or part in respect of a vessel entering the Islands only for the purposes of a Sports Fishing Tournament approved under regulation 21.	

SCHEDULE 4**IMPLIED TERMS***(Regulation 7)***1. ALL LICENCES ISSUED UNDER REGULATION 6**

Save as otherwise expressly provided in a licence there shall be implied in every licence issued under Regulation 6 a condition that:

1. Where the Licensee is a Company or a Partnership no share or beneficial interest therein shall be assigned, transferred or sold where such assignment, sale or transfer shall affect the controlling interest in the company or partnership (as defined by the Business Licensing Ordinance) without the consent in writing of the issuing authority which shall be in the discretion of the issuing authority.
2. Where the Licensee (which expression shall for this purpose include any employee, servant or agent of the Licensee) is in breach of any of the conditions of the licence or any of the provisions of these Regulations or any condition of any other licence issued to the Licensee under these Regulations the issuing authority may forthwith revoke or suspend the licence.

2. LICENCES ISSUED UNDER REGULATIONS 6(1)(b),(c), (d) AND (f)

Save as otherwise expressly provided in a Licence there shall be implied in every licence issued under Regulations 6(1)(b), 6(1)(c), 6(1)(d) and 6(1)(f) a condition that:

1. The Licensee shall permit any Fisheries Officer, Public Health Officer or Customs Officer to enter upon any land, premises or vessel used by the Licensee in connection with the taking, storage, processing or exporting of marine products under the licence at all times for the purpose of inspecting the said land premises or vessel or any equipment, marine products, documents or records thereon.
2. The Licensee shall comply with all reasonable directions given by a Fisheries Officer or a Public Health Officer in relation to the storage, processing or exporting of any marine product.
3. The Licensee shall keep such records and make such returns of the quantities and type of marine products which are taken, purchased or exported under the licence as the Chief Fishery Officer or the Collector of Customs may from time to time prescribe.
4. The Licensee shall submit to the Chief Fishery Officer within 14 days of the end of each month a return showing the number, weight

and type of all marine products taken, purchased, processed or exported under the licence during each calendar month and such other particulars as the Chief Fishery Officer may require.

5. The Licensee shall ensure that all marine products intended for human consumption which are exported by the Licensee are in good condition and fit for human consumption and meet the standards of the country to which the marine products are to be exported.
6. The holder of a Class B Processing and Export Licence issued under Regulation 6(1)(b) shall export only such marine products as are processed at the licensed premises and in any event shall not export more than fifty *per cent* of any species of marine product processed at the licensed premises without a written certificate issued by the Chief Fishery Officer which certificate will only be issued where the Chief Fishery Officer is satisfied that the local market for the species of marine product in question is at the relevant time over supplied.
7. The holder of a Class A Processing Licence issued under Regulation 6(1)(b) shall maintain and operate at the licensed premises a blast or plate freezer, a separate holding room for processed marine products, fully equipped and fly screened facilities for processing and proper toilet facilities.
8. The holder of a Class B Processing Licence issued under Regulation 6(1)(b) shall maintain and operate at the licensed premises a deep freezer or freezers which shall be used for storage of marine products only.

3. LICENCES ISSUED UNDER REGULATIONS 6(1)(i) AND 6(1)(j)

Save as otherwise expressly provided in a licence there shall be implied in every licence issued under Regulations 6(1)(i) or 6(1)(j) a condition that:

1. If so required by the Chief Fishery Officer the owner operator or captain of any vessel licensed under these Regulations shall furnish the Chief Fishery Officer, in such form and at such intervals as the Chief Fishery Officer may direct, a return recording catch statistics relating to the operation of the vessel.
 2. Where a vessel is foreign owned with an overall length exceeding 20feet there shall be displayed on the vessel for the purposes of Regulation 5(3) the vessel's International Radio call sign and the vessel's licence number on the top and both sides amidship where it is clearly discernible from the air and from the sea in letters at least one metre high, forty centimetres wide and in black on a white background (or in other similar contrasting colours).
-

INDEX

		Page
Fees	Fishing licence	61
Fishery officer	Defined	10
Fishing	Close season	19
	Forms	31
	Legal size	20
	Licence	4
	Licence fees	61
	Licence, application	15
	Licence, implied terms	63
	Methods controlled	17
	Nets	23
	Ordinance	1
	Regulations	5
	Restricted without licence	12
	Search warrants	26
	Traps	22
Licence	Fishing	13
	Fishing, implied terms	63
Vessel	Fishing, to be licensed	13



TURKS AND CAICOS ISLANDS

CHAPTER 80

NATIONAL PARKS ORDINANCE and Subsidiary Legislation

Revised Edition
showing the law as at 15 May 1998

This is a revised edition of the law, prepared by the Law Revision Commissioner under the authority of the Revised Edition of the Laws Ordinance 1997.

This edition contains a consolidation of the following laws—

	Page
NATIONAL PARKS ORDINANCE	3
Ordinance 11 of 1975 .. in force 30 October 1975	
Amended by Ordinance 10 of 1989 .. in force 12 January 1990	
Amended by Ordinance 12 of 1992 .. in force 7 August 1992	
NATIONAL PARKS ORDER – Section 3	9
Legal Notice 40/1992 .. in force 7 August 1992	
Amended by Legal Notice 35/1995 .. in force 14 July 1995	
NATIONAL PARKS REGULATIONS – Section 8	21
Legal Notice 41/1992 .. in force 7 August 1992	
Amended by Legal Notice 4/1994 .. in force 18 February 1994	
Amended by Legal Notice 18/1994 .. in force 29 April 1994	
INDEX	40
Also included in this chapter is a designation by the Executive Council of areas for use by the public as parks—	
PUBLIC PARKS GRAND TURK DESIGNATION	39
Gazette Notice 198 of 1993 .. in force 17 March 1993	

CHAPTER 89
NATIONAL PARKS ORDINANCE

ARRANGEMENT OF SECTIONS

SECTION

1. Short title
 2. Interpretation
 3. Declaration of national parks etc
 4. Usage of national parks, etc
 5. Provisions with respect to land in areas declared to be national parks, etc
 6. Restriction on certain activities harmful to the ecology
 7. Enforcement
 8. Regulations
-

CHAPTER 89
NATIONAL PARKS ORDINANCE

(Ordinances 11 of 1975, 10 of 1989 and 12 of 1992)

Commencement

[30 October 1975]

AN ORDINANCE TO PROVIDE POWERS TO PERMIT THE ESTABLISHMENT OF PARKS, NATURE RESERVES, SANCTUARIES AND AREAS OF HISTORICAL INTEREST, AND GENERALLY FOR THE CONSERVATION OF THE NATURAL ENVIRONMENT AND ECOLOGY OF THE ISLANDS AND FOR PURPOSES CONNECTED THEREWITH.

Short title

1. This Ordinance may be cited as the National Parks Ordinance.

Interpretation

2. In this Ordinance, unless the context otherwise requires—
“area of historical interest” means an area declared to be of historical interest under section 3;
“court” means the Magistrate’s Court;
“development” includes any change in use, the erection of any structure and the carrying out of any drainage, dredging or

sewerage scheme, and such other activities as may be prescribed by the Governor by order;

“national park” means a national park established under section 3;

“nature reserve” means a nature reserve established under section 3;

“private land” means any land the title to which is vested in any person other than the Crown or the Government;

“sanctuary” means a sanctuary established under section 3.

3. The Governor may by order declare any area in the Islands, including any part of the territorial waters of the Islands, to be—

Declaration of
national parks
etc

- (a) a national park; or
- (b) a nature reserve; or
- (c) a sanctuary; or
- (d) an area of historical interest.

4. (1) Subject to any regulations relating to any particular national park or nature reserve—

Usage of
national parks,
etc

- (a) an area which is designated as a national park shall be open to members of the public for recreational use, including camping, fishing and sailing, and the Governor may make a grant of development permission for the erection in the area of buildings, the construction of roads, marinas and such other development as may be considered to be desirable to facilitate enjoyment by the public of the natural setting of the area and any features of historical interest therein:

Provided that in considering whether or not any such development as is mentioned in this paragraph as being permissible shall be authorised in any particular case, the paramount consideration shall be to limit such development to the minimum consistent with the reasonable access to and enjoyment of the area by members of the public;

- (b) an area which is designated as a nature reserve may be used for agricultural, arboricultural, piscicultural, sporting and recreational purposes, subject to such restrictions as may be prescribed and which may be considered desirable to ensure a proper balance in the natural ecology of the area;

but no building or other development shall be permitted except in accordance with the conditions of a grant of development permission made by the Governor and such grant shall only be made for a building or other development which is required for one of the aforesaid uses which are permissible in a nature reserve.

(Amended by Ord. 10 of 1989)

(2) The declaration of an area as a sanctuary shall be made primarily for the purpose of the protection of the natural ecology, or of any particular form of living organism (including any marine life), in the area, and the avoidance of disturbance of the area by human beings, either at any time or at particular times according to the circumstances and the form of life which it is desired to protect. Entry into a sanctuary shall not be permitted except in accordance with any regulations made in respect of that sanctuary and no person shall carry out any development in a sanctuary.

(3) The declaration of an area of historical interest shall be primarily for the purpose of protecting an object of historical interest therein. Such an area may form part of a national park, nature reserve or sanctuary, and in such case shall be subject to those provisions of this section and any regulations which are applicable to that park, reserve or sanctuary. In the case of any other area of historical interest, the public shall have access to the area, or to any object of interest therein, during such times and subject to such conditions as may be prescribed by regulations which are applicable to that area; and no person shall carry out any development in that area except under a grant of development permission made by the Governor.

(Amended by Ord. 10 of 1989)

Cap.73

(4) Sections 63, 64 and 65 of the Physical Planning Ordinance shall apply *mutatis mutandis* to applications for development permission in a national park, a nature reserve, a sanctuary or an area of historical interest as they apply to applications for development permission in a conservation area made under the Physical Planning Ordinance:

Provided that the Director of Planning appointed under the Physical Planning Ordinance shall make available to the Minister responsible for this Ordinance a copy of the environmental impact statement referred to in those sections before any application for development permission is approved. *(Inserted by Ords.10 of 1989 and 12 of 1992)*

5. In any case in which private land is included in any area which has been declared to be a national park, a nature reserve, a sanctuary or an area of historical interest and the Governor does not consider that it is necessary for the purpose to which the declaration relates to acquire such land under the Land Acquisition Ordinance, any person entitled to any interest therein shall be entitled to receive compensation from the Government for the diminution, if any, in the value of his interest consequential upon any restrictions imposed on his use of the land by reason of such declaration. If agreement cannot be reached between the Government and the party concerned as to whether or not any compensation is payable, or as to the amount thereof, the matter shall be referred to arbitration under the provisions of the Arbitration Ordinance.

Provisions with respect to land in areas declared to be national parks, etc

Cap. 78

Cap. 47

6. (1) If the Governor is satisfied that—

- (a) it is, or is likely to become, necessary for the prevention of the pollution of, or any other harmful or disturbing effect or influence on, the natural ecology of any national park, nature reserve or sanctuary; or
- (b) the preservation of any particular form of living organism (including vegetable or marine life) in any part of the Islands so requires,

Restriction on certain activities harmful to the ecology

he may by order impose restrictions on any development or the depositing or discharge of any waste or harmful matter in any area which he considers would have direct or indirect harmful effect on such natural ecology or living organism.

(2) The provisions of section 5, with respect to the assessment and payment of any compensation, shall apply *mutatis mutandis* in the case of any diminution in the value of any interest in land by reason of any restrictions imposed by order made under this section.

7. (1) Any person who—

- (a) carries out any development in a national park, nature reserve, sanctuary or area of historical interest, except in accordance with the terms of a grant of development permission made under section 4; or
- (b) fails to comply with any restriction imposed by an order made under section 6; or
- (c) enters any sanctuary without authority,

Enforcement

shall be guilty of an offence and shall be liable on summary conviction to a fine of \$50,000 dollars or to twelve months imprisonment or to both such fine and imprisonment.

(Amended by Ords. 10 of 1989 and 12 of 1992)

(2) The court before which any person is convicted under the provisions of this section may order the demolition of any structure erected or the reinstatement of anything altered or removed in contravention of the provisions referred to in subsection (1), and in default of compliance with any such order of the court, the Governor may cause the necessary work to be carried out and may recover as a civil debt the cost of so doing from the person in default.

(3) An appeal shall lie to the Supreme Court from any decision or order of the Magistrate's Court made under this section.

Regulations

8. (1) The Governor may make regulations for carrying into effect the purposes and provisions of this Ordinance, and without derogation from the generality of the power hereby conferred, such regulations may provide—

- (a) for the control and management of national parks, nature reserves, sanctuaries and areas of historical interest;
- (b) the conditions subject to which members of the public shall be permitted to enter and use any national park, nature reserve or area of historical interest, and for the issue of licences to permit persons to enter any national park, nature reserve, sanctuary or area of historical interest for any particular purpose;
- (c) for the regulation and control of prohibition of any hunting or fishing in or the removal of any living organism or any substance from any national park, nature reserve, sanctuary or area of historical interest;
- (d) for the appointment of persons as wardens and for the conferring on such wardens of powers to enforce the regulations;
- (e) that a contravention of a provision of the regulations constitutes an offence and for a penalty on summary conviction in respect of such contravention not exceeding—
 - (i) a fine of \$50,000 or a term of imprisonment for 12 months or both; and

- (ii) in the case of a continuing offence, a fine of \$100 for every day or part of a day on which the offence continues;
- (f) power for a court to order a person convicted of an offence referred to in paragraph (e) to pay the cost of repairing any damage to a national park, nature reserve, sanctuary or area of historical interest caused by the commission of such offence;
- (g) power for a warden, a police officer or a fishery officer to arrest without warrant any person whom such warden or officer, as the case may be, reasonably suspects to be committing, to have committed or to be about to commit an offence against the regulations or this Ordinance, and for the seizure or forfeiture to the Crown of any article used in the commission of any such offence or alleged offence;
- (h) power for a police officer or fishery officer to initiate proceedings for offences against the regulations; and
- (i) for the imposition of fees and charges in respect of any matter with regard to which provision is made in the regulations or in this Ordinance.

(Amended by Ord. 12 of 1992)

(2) In subsection (1)(f), “fishery officer” has the meaning assigned thereto by regulation 3(1) of the Fisheries Protection Regulations. *(Substituted by Ord. 12 of 1992)*

Cap. 104

NATIONAL PARKS ORDER – SECTION 3*(Legal Notices 40 of 1992 and 35 of 1995)****Made by the Governor under section 3 of the National Parks Ordinance.***

Commencement

[7 August 1992]

Short title

1. This Order may be cited as the National Parks Order.Formation of
national parks**2.** The areas named and described in the first column of Part I of the Schedule are declared to be national parks for the protection or promotion of the corresponding features of interest specified in the second column.Formation of
nature reserves**3.** The areas named and described in the first column of Part II of the Schedule are declared to be nature reserves for the protection or promotion of the corresponding features of interest specified in the second column.Formation of
sanctuaries**4.** The areas named and described in the first column of Part III of the Schedule are declared to be sanctuaries for the protection or promotion of the corresponding features of interest specified in the second column.Formation of
areas of
historical interest**5.** The areas named and described in the first column of Part IV of the Schedule are declared to be areas of historical interest for the protection or promotion of the corresponding features of historical interest specified in the second column.

Site plans

6. (1) The areas described in the Schedule are delimited on site plans designated NP 1–11, NR 12–22, S 23–26 and HA 27–33, that may be inspected at the offices of the Department of Environment, Heritage and Parks during normal working hours.

(2) In a case of inconsistency between the description of an area in the Schedule and its delimitation on a site plan, the former shall prevail for all purposes of interpretation.

SCHEDULE

PART I

NATIONAL PARKS

Name and Area	Features of Interest
1. <i>Admiral Cockburn Land and Sea National Park:</i> An area of 1185 acres in South Caicos bounded by a straight line from High Point to the reef wall at grid reference BP 410 779, the reef wall to BP 337 740 including a straight line across Big Cut connecting the reef wall on both sides, a straight line to the south point on Long Cay, the high water mark along the north side of Long Cay, a straight line from the north - east tip of Long Cay to South Caicos at BP 380 780, the western, northern and western boundaries of Crown land comprising parcels 20309/1 and 2 to the high water mark at BP 382 779 on Girl's Bay, and the high water mark to the starting point at High Point. Grid references are to sheet 12 Series E8112 (DOS 309P) Edition 2-OSD 1985. <i>Site Plan NP1.</i>	Excellent wall diving and representative coral reef ecosystems
2. <i>Chalk Sound National Park:</i> An area of 3607 acres in Providenciales bounded by common boundary with Frenchman's Creek Sanctuary from grid reference YV 769 118 to YV 778 083 (Ref. points YV 765 117, YV 763 111, YV 761 111, YV 758 103, YV 757 097, YV 757 092, YV 765 095, YV 777 086, YV 778 083). A straight line to YV 783 081, the shoreline of Silly Creek and Chalk Sound to YV 818 079, the west side of the South Dock main road to YV 824 091, a track leading to Chalk Sound to YV 810 095, along the shore of Chalk Sound to YV 794 107, a straight line to YV 795 109 and a line roughly parallel to and at a distance of about 600 ft from the shoreline of Chalk Sound to the starting point. Grid references are to sheet 2 Series EB112 (DOS 309P) Edition 2-OSD 1985.	Scenic water; bone-fish; boating; picnic area

*Site Plan NP2.*3. **Columbus Landfall Marine National Park:**

An area of 1280 acres in Grand Turk comprising the area of sea from high water mark to the reef wall; a straight line from the North Creek entrance to BP 782 800, along the edge of the reef wall to BP 773 704, a straight line to Booby Rock Point, along the high water mark to the starting point.

Grid references are to sheet 14 Series E8112 (DOS 309P) Edition 2-OSD 1985.

*Site Plan NP3.*4. **Conch Bar Caves National Park:**

An area of 235 acres in Middle Caicos bounded in the north by the high water mark and in the east by a line connecting grid reference BQ 120 167, BQ 120 162, BQ 119 161, BQ 119 158, to the south by the main road and to the west by east road, a line connecting grid reference BQ 107 162, BQ 108 162, BQ 108 164 and the south and east side of a 40 feet wide road reserve and back to the starting point (Grid references are to sheet 7 Series E8112 (DOS 309P) Edition 2-OSD 1984.

*Site Plan NP4.*5. **East Bay Islands National Park:**

An area of 8746 acres in North Caicos comprising Bay, Conch, High and Major Hill Cays and bounded by a line from grid reference AQ 992 289 at North Mouth to AQ 994 292, AQ 999 292, BQ 019 277, BQ 033 261, BQ 039 204, BQ 031 188, BQ 020 193, AQ 999 222, AQ 995 231, AQ 994 241, AQ 997 261, AQ 983 265, the middle of the channel between Major Hill Cay and the mainland, AQ 986 289, AQ 987 291 and to the starting point. Grid references are to sheet 5 Series E8112 (DOS 309P) Edition 2-OSD 1985.

Site Plan NP5.

Excellent wall diving

Extensive underground cave system containing large subterranean lagoons and bat colonies; once mined by slaves for guano

Scenic islands and favourite picnic area

6. **Fort George Land and Sea National Park:**

Comprising an area of 1220 acres north of Pine Cay bounded on the south-east side by a line some 500 feet from Grouper Cay from grid reference ZV 029 232 to ZV 023 221, on the south-west side by the northern edge of a channel to YV 991 231, a straight line to the reef wall at YV 984 243, along the reef wall to YV 995 254, a straight line to ZV 003 242, along the Fort George cut via straight lines to ZV 010 238, ZV 014 236, ZV 018 237, ZV 029 234, and back to the start. Grid references are to sheet 4 Series E8112 (DOS 309P) Edition 2-OSD 1984.

Site Plan NP6.

Dive and picnic sites; 1798 English Fort, shipwreck, cannons in shallow water, iguanas ospreys and wading birds

7. **Grand Turk Cays Land and Sea National Park:**

An area of 386 acres south-east of Grand Turk comprising the whole land area of Gibbs, Penniston and Martin Alonza Pinzon Cays off Grand Turk and the surrounding 400 ft of sea in each case.

Site Plan NP7.

Shallow dive sites, bird and fish nurseries, day outings and picnics

8. **North West Point Marine National Park:**

An area of 2535 acres in Providenciales bounded by the north-west side of Wheeland Cut from the high water mark at grid reference YV 769 188 to the reef wall, along the reef wall to a point at grid reference YV 763 225, along the reef wall to grid reference YV 731 134 approximately north-west of Wiley Point, to Wiley Point; and along the high water mark to the starting point. Grid references are to sheet 2 Series E8112 (DOS 309P) Edition 2-OSD 1985.

Site Plan NP8.

Best wall diving off Providenciales

9. ***Princess Alexandra Land and Sea National Park:***

An area of 6532 acres in Providenciales bounded by a line taken due north of Blue Mountain (C42) from the high water mark to the reef wall, along the reef wall to a point approximately due north of the most westerly point of Water Cay, approximately due south to a point some 1000 ft away from the most westerly point of Water Cay, east 500 ft along the southern coast of Water Cay to YV 972 177 a straight line south to YV 962 150 along the shoreline of Mangrove Cay to Leeward-Going-Through Point, along the high water mark to the starting point. Grid references are to sheet 3 series E8112 (DOS 309P) Edition 2-OSD 1985.

Site Plan NP9.

Dive and picnic excursions, iguanas, ospreys, mangroves and marine life

10. ***South Creek National Park:***

An area of 183 acres in Grand Turk bounded by a line across the mouth of South Creek extending along the coast to the north of Materson's Point, along the northern boundary of Parcel 10411/4 and the western boundary of Parcel 10411/3 until this meets a wall, in a south-westerly direction along the wall to the south side of the road to Materson's Point, along the south side of this road in a westerly direction until it's junction with a track, leading to the eastern end of Grand Turk Airport, along the east side of this track around the end of the runway to the canal leading from Hawks Pond Salina to South Creek. Around the Crown land holdings 10505/5 and 6 comprising mangroves and wetlands following the west side of the track ending at South Creek; then in an easterly direction to the starting point and excluding Parcel 10410/3 Eves Hill which is in private ownership.

Site Plan NP10.

Wetlands, mangroves, viewpoint, tourist destination, picnic areas and small boat activities and harbourage

11. **West Caicos Marine National Park:** Excellent wall diving
- An area of 980 acres in West Caicos comprising an area from the high water mark at Logwood Point, a straight line to YV 640 030 and YV 627 030, along the reef wall south of Yankee Town to YU 615 964, a straight line to the high water mark at YU 618 963, north along the high water mark to the starting point. Grid references are to sheet 1 series E8112 (DOS 309P) Edition 2-OSD 1984.
- Site Plan NP11*

PART II

NATURE RESERVES

Name and Area	Features of Interests
12. Admiral Cockburn Nature Reserve (Long Cay, Six Hill Cays, Middleton Cay): An area of 1065 acres in South Caicos comprising the land area of Long Cay, the land area of Six Hill Cays and Middleton Cays and the surrounding 400 ft of sea. <i>Site Plan NR12.</i>	Important for rare rock iguana and breeding terns and frigate birds
13. Bell Sound Nature Reserve: An area of 2820 acres in South Caicos bounded by a line connecting grid reference BP 369 849, BP 402 849 and BP 402 848, the high water mark to BP 379 823 and straight lines to BP 369 823 and back to the starting point. Grid references are to sheet 12 Series E8112 (DOS 309P) Edition 2-OSD 1985. <i>Site Plan NR13.</i>	Bonfish reserve
14. Cottage Pond Nature Reserve: An area of 20 acres in North Caicos bounded by straight lines connecting ZV 099 285, ZV 099 281 and AQ 901 281, along the 25 ft. contour to the road to Sandy Point at AQ 903 284 and back along the road to the starting point. Grid references are to sheet 4 Series E8112 (DOS 309P) Edition 2-OSD 1984 and sheet 5 Series E8112 (DOS 309P) Edition 2-OSD 1985. <i>Site Plan NR14.</i>	Bird nesting

15. ***Dick Hill Creek and Bellefield Landing Pond Nature Reserve:***

An area of 975 acres in North Caicos bounded by a straight line from ZV 067 266 on the eastern edge of Dick Hill Creek to ZV 068 266, a straight line to ZV 068 253 on the north side of the Bellefield Landing road, along the north side of this road to ZV 065 252, the north side of a track to ZV 057 256, a straight line to ZV 056 258, a straight line to ZV 053 272, following the edge of the hard ground around Dick Hill Creek back to the starting point. Grid references are to sheet 4 Series E8112 (DOS 309P) Edition 2-OSD 1984.

Site Plan NR15.

Bird nesting

16. ***Lake Catherine Nature Reserve:***

An area of 968 acres in West Caicos bounded by a straight line connecting grid reference points YU 639 998, YU 627 994, YU 622 967, YU 624 955, YU 627 952 and YU 629 952 and by a curved line roughly parallel to and at a distance of 500 feet from the east shore of Lake Catherine connecting reference points YU 629 952 and YU 639 998. Grid references are to Sheet 1 Series E8112 (DOS 309P) Edition 2-OSD 1984

Site Plan NR16.

Area of scenic value and of interest to naturalists; large hypersaline lake supporting abundant pink bivalve molluscs and black mussels; habitat of sea turtles and bird life including flamingoes, with old causeway and small islands offering bird nesting sites

17. ***North, Middle and East Caicos Nature Reserve (International Ramsar Site):***

An area of 210 square miles bounded by straight lines connecting grid references ZV 050 230, ZV 090 250 and AQ 936 260; the edge of the hard ground; a straight line connecting AQ 936 260 and AQ 934 262; the 25 foot contour, the Kew/Whitby road; a straight line connecting AQ 911 279 and AQ 935 276; the edge of the hard ground (including Mally Pond Slough and Whitby Bight); straight line connecting AQ 942 298, AQ 945 306 and AQ 947 305; the edge of the hard ground; a straight line connecting AQ 951 296 and AQ 958 296; the edge of the hard ground; a straight line connecting BQ 028 162 and BQ 080 150; the edge of the hard ground (including Flamingo Pond); straight lines connecting

A wetland site of international importance containing a variety of habitat types representative of the region. Noteworthy individual sites within the park include the Mally Pond Slough, Sawgrass Pond and Flamingo Pond wetland area which contains excellent natural mangrove swamp, rich and varied fauna and diverse bird life, the unique Ocean Hole

BQ 160 140, BQ 165 132, BQ 167 137; BQ 175 138; BQ 176 137, BQ 182 127, BQ 188 128; the shoreline of Armstrong Pond; a straight line between BQ 186 115 and BQ 187 111; the edge of the hard ground; a straight line between BQ 268 060 and BQ 286 071 the centre line of the channel between Joe Grants Cay and East Caicos; a straight line connecting BQ 305 090 and BQ 330 085; the reef wall, a straight line connecting BQ 371 056 and BQ 364 045; the north-east side of a track; a straight line connecting BQ 323 075 and BQ 322 078; the edge of the hard ground; and straight lines connecting BQ 330 040, BP 260 960, BQ 050 020, ZV 050 180 and ZV 050 230.

Grid references are to sheets 4, 5, 6, 8, 9, 10, 11 Series E8112 (DOS 309P) Edition 2-OSD 1984.

Site Plan NR17.

off Middle Caicos, believed to contain diverse and unusual fauna; the Armstrong and Big Ponds areas of Middle Caicos, the former area including numerous Arawak village sites, and the Iguana Cay and Flamingo Pond area on and close to East Caicos. The whole area is a particularly good example of coastal wetland habitat in the Caribbean region. It regularly supports 10% of the individuals in a population of one species of waterfowl (on Sawgrass Pond, the threatened West Indian Whistling Duck) it has special value as the habitat of animals at a critical stage of their biological cycles (submerged banks, creeks and lagoons used by endangered turtles and commercial fish species for feeding).

18. ***North West Point Pond Nature Reserve:***

An area of 150 acres in Providenciales bounded by the north-east edge of the wetland (coinciding with the south-west boundary of Parcels 60601/1 and 4) from the high water mark at Little Bay to a track at grid reference YV 763 182, the aforementioned track to YV 762 182, an irregular line approximately parallel to and 100 feet from the edge of the wetland to the high water mark, and the high water mark to the starting point at Little Bay.

A prime example of red mangrove lagoon habitat with an abundance and diversity of lagoon fauna, serving as a nursery and food source for the neighbouring waters; an important feeding area for migrant wading birds

Grid references are to sheet 2 Series E8112 (DOS 309P) Edition 2-OSD 1985.

Site Plan NR18.

and breeding area for locally common waterfowl species

19. ***Pigeon Pond and Frenchman's Creek Nature Reserve:***

An area of 5910 acres in Providenciales including Pigeon Pond and the area of mud flats to the south and south-west known as Frenchman's Creek. Adjoins Chalk Sound and North-West Point Marine Parks. Comprises an area bounded by a straight line from grid reference point YV 759 158 to YV 746 149; the high water mark to Wiley Point (the common boundary with the North-West Point Marine Park); a straight line from Wiley Point through the extremity of Bonefish Point to YV 733 076; a straight line to YV 739 070, a straight line to the extremity of West Harbour Bluff, the high water mark along Proggin' Bay to YV 778 083, the common boundary with the Chalk Sound National Park to YV 769 118 (Reference points YV 777 086, YV 765 095, YV 757 092, YV 757 097, YV 758 103, YV 761 111, YV 763 111, YV 765 117), a straight line to YV 770 128, the 25 foot contour to starting point at YV 759 158. Grid references are to sheet 2 Series E8112 (DOS 309P) Edition 2OSD 1985.

Site Plan NR19.

Wetland birds; West Harbour Sluff rock carvings

20. ***Princess Alexandra Nature Reserve:***

An area of 450 acres in Providenciales comprising the entire land area of Little Water, Mangrove and Donna Cays.

Site Plan NR20.

Picnic excursions, iguanas, ospreys and mangroves

21. ***Pumpkin Bluff Pond Nature Reserve:***

An area of 427 acres in North Caicos comprising the entire area of Pumpkin Bluff Pond to the edge of hard ground, lying within the area bounded by grid references ZV 086 306, ZV 096 294 and AQ 913 312. Grid references are to sheet 4 Series E8112 (DOS 309P) Edition 2-OSD 1984 and sheet 5 Series E8112 (DOS 309P) Edition 2-OSD 1985.

Site Plan NR21.

Bird nesting

22. **Vine Point (Man O' War Bush) and Ocean Hole Nature Reserve:**
An area of 1870 acres in Middle Caicos bounded by a line connecting the following grid references BQ 054 046, BQ 043 034, BQ 060 018, BQ 099 044, BQ 092 051, BQ 066 035 and to the starting point. Grid references are to sheets 6 and 8 Series E8112 (DOS 309P) Edition 2-OSD 1984.
Site Plan NR22.
- Frigate bird nesting area, and 220 feet deep by 1200 feet wide hole in 3 feet shallow sand bottom

PART III

SANCTUARIES

Name and Area	Features of Interest
23. Big Sand Cay Sanctuary: An area of 372 acres south of Salt Cay comprising the entire island of Big Sand Cay and nearby islets, including Little Sand Cay and the surrounding 400 ft of sea. <i>Site Plan S23.</i>	Nesting birds and turtles
24. French, Bush and Seal Cays Sanctuary: An area of 50 acres comprising the entire land area of French Cay (south of West Caicos), Bush Cay and the Seal Cays (both south of South Caicos) on the south side of the Caicos Bank. <i>Site Plan S24.</i>	Nesting terns and frigate birds
25. Long Cay Sanctuary: An area of 198 acres south-east of Grand Turk comprising the total land area of Long Cay and nearby islets and the surrounding 400 ft of sea. <i>Site Plan S25.</i>	Nesting terns; flora; iguanas
26. Three Mary Cays Sanctuary: An area of 33 acres in North Caicos comprising the total area of Three Mary Cays and the surrounding 400 ft of sea up to 50 ft seaward of the low water mark of the north coast of North Caicos. <i>Site Plan S26.</i>	Osprey nest site

PART IV

AREAS OF HISTORICAL INTEREST

Name and Area	Features of Interest
27. <i>Boiling Hole Area of Historical Interest:</i> An area of 118 acres in South Caicos comprising an area bounded by Cockburn Harbour to Highlands Road from BP 380 784 to BP 387 786, straight lines connecting to BP 385 790, BP 386 792 and BP 380 792, following the edge of the salina south to Cockburn Harbour Highlands Road. Grid references are to sheet 12 Series E8112 (DOS 309P) Edition 2-OSD 1985. <i>Site Plan HA27.</i>	Salinas
28. <i>Cheshire Hall Area of Historical Interest:</i> An area of 1 acre in Providenciales comprising the ruins and surroundings contained within and including the site wall, located south of Leeward Highway approximately one quarter of a mile east of the junction with the Blue Hills Road bounded by a line connecting the following Grid references (784E, 241ON) 077 784, 071 907, 205 897, 196 802. Grid references are to map of scale 1:1250 <i>Site Plan HA28.</i>	Ruins of 1790's Plantation House and outbuildings
29. <i>Fort George Area of Historical Interest:</i> An area of 1 acre on Fort George Cay (between Providenciales and North Caicos) at the north-west point of the cay, Grid reference ZV 002 238. Grid reference is to sheet 4 Series E8112 (DOS 309P) Edition 2-OSD 1984. <i>Site Plan HA29.</i>	1798 English Fort
30. <i>H.M.S. Endymion Wreck Area of Historical Interest:</i> An area of 6.5 acres to the south of Great Sand Cay comprising the site of the wreck and the entire area within 100 yards of the wreck. <i>Site Plan HA30.</i>	18th century ship-wreck in shallow water

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31. <i>Molasses Reef Wreck Area of Historical Interest:</i> An area of 1 acre south-east of West Caicos comprising the site of the wreck and the area around it designated as a restricted area. <i>Site Plan HA31.</i>	Site of the oldest known wreck in the western hemisphere
32. <i>Salt Cay Area of Historical Interest:</i> An area of 435 acres in Salt Cay comprising Town Salinas and the Waterfront from North District at Grid reference BP 706 604 to South District at Grid reference BP 701 591, Grey Salina and surroundings of Old Whaling Station from Long Bay Point at Grid reference BP 727 602 to BP 732 607, including Whale Island and Whale House Bay. Grid references are to sheet 15 Series E8112 (DOS 309P) Edition 2-OSD 1985. <i>Site Plan HA32.</i>	Salt works, historical buildings including brown and white houses, site of whaling station
33. <i>Sapodilla Hill Area of Historical Interest:</i> An area of 0.29 acres in Providenciales comprising the area of Sapodilla Hill within the 70 feet contour line <i>Site Plan HA33.</i>	Rock carving by shipwrecked sailors
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NATIONAL PARKS REGULATIONS**ARRANGEMENT OF REGULATIONS**

REGULATION

1. Short title
2. Interpretation
3. Prohibitions and permitted activities
4. Rescue vehicles and vessels
5. Emergencies
6. Zones
7. Dive vessels and charter vessels
8. Provisions as to new and existing buoys
9. Specimen and artifact collection
10. Enforcement
11. Returns
12. Fees
13. Offences and penalties

SCHEDULE I: Forms

SCHEDULE II: Zones

NATIONAL PARKS REGULATIONS – SECTION 8*(Legal Notices 41 of 1992, 4 of 1994 and 18 of 1994)****Made by the Governor under section 8 of the National Parks Ordinance.***

Commencement

[7 August 1992]

Short title

1. These Regulations may be cited as the National Parks Regulations.

Interpretation

2. In these Regulations, unless the context otherwise requires—

“anchoring zone” means a zone established under regulation 6(1)(f);

“animal or plant” means any marine or land vertebrate or invertebrate or animal product, whether living or dead, and any marine or land plant or plant product whether living or dead, including marine products as defined in the Fisheries Protection Regulations;

Cap. 104

“access lane” means a vessel or vehicle right of way within and perpendicular to the shoreline for access to and egress from the shore;

“aquatic sports zone” means a zone designated under regulation 6(1)(c);

“area of historical interest” means an area so declared and described in the National Parks Order;

“artifact” means any human-made object on land or in the sea that is of anthropological, historical or artistic value, including carvings and drawings in, or on, rock, carved stone and pottery shards;

“beach games” means games and recreations normally associated with recreational beaches and adjacent waters, other than those specifically excluded by these Regulations;

“camping zone” means a zone established under regulation 6(1)(g);

“charter vessel” means any seagoing sail or motor powered vessel licensed or approved for hire to carry people;

“Director” means the Director of Environment, Heritage and Parks;

“Director of Planning” means the Director of Planning appointed under the Physical Planning Ordinance;

Cap. 73

“dive operator” means a person providing snorkel or scuba diving facilities for other persons, involving entry into, or exit from the water by means of a vessel;

“dive vessel” means a vessel operated by a dive operator, when such vessel is actually involved in dive work, including the transportation of divers to and from the dive site;

“DOE” means the Department of Environment, Heritage and Parks;

“engineless vessel” means any sea-going apparatus with no onboard engine and powered by only human effort, including canoes, kayaks, surfboards and non-motorized dinghies;

“fishing zone” means a zone established under regulation 6(1)(j);

“fixed DOE buoy” means a DOE numbered white with blue stripe buoy, or any buoy with DOE approved markings that has been installed in a site approved by the DOE;

“form” means a form prescribed in Schedule I;

“hovercraft” means a self-propelled motorized sea craft that rides on a cushion of air, capable of motion on both land and sea;

“jet ski” means (regardless of the trade name of the vessel concerned) a motor vessel propelled by a water jet—

- (a) capable of carrying a maximum of 4 persons; and
- (b) having a maximum length of 10 feet; (*Amended by Legal Notice 18 of 1994*)

“motor vehicle” means any self-propelled wheeled vehicle, including cars, trucks, motorcycles, scooters and all terrain vehicles (ATV);

“motor vessel” means any apparatus propelled, or capable or being propelled, on the sea by use of an onboard or outboard motor, including sail vessels containing motors;

“national park” means an area so declared and described in the National Parks Order;

“nature reserve” means any area so declared and described in the National Parks Order;

“Park Warden” means a person referred to in regulation 12(1) or (2);

“parking zone” means a zone established under regulation 6(1)(h);

“permanent mooring” means a mooring with a suitable attachment for securing a mooring buoy set into or laid on the sea bed solely for that purpose and incapable of movement in normal circumstances;

“rescue vehicle” or “rescue vessel” means a vehicle or vessel approved by the Director for use in rescue under regulation 4;

“sanctuary” means an area so declared and described in the National Parks Order;

“sail vessel” means a wind surfer, boat or ship propelled on the water by the wind;

“shoreline” means that part of any national park, nature reserve or sanctuary comprising the foreshore and sand-dunes immediately adjacent to the sea;

“swimming zone” means a zone established under regulation 6(1)(a);

“training zone” means a zone designated under regulation 6(1)(d);

“vessel” means any vehicle which travels on water and includes ships, boats, dinghies, windsurfers, jet skis and any motorized vessel;

“wall” means the 50 fathom depth isobath on the seaward boundary of any national park;

“water ski” means a ski or ski-like apparatus used in gliding behind a power vessel over the surface of the water;

“zone” means a zone, access lane or right of way established under regulation 6.

Prohibitions and
permitted
activities

3. (1) The following are prohibited within all national parks—

- (a) the taking of any animal or plant by any method on land or at sea, except to the extent permitted in any fishing zone;
- (b) the taking of any artifact;
- (c) the destruction of, or damage or injury to, any animal or plant;

- (d) the removal of sand, rock, coral, coral-rag or any calcareous substance;
 - (e) anchor damage to coral reef structures living or dead and associated marine plant and animal life;
 - (f) the anchoring of vessels greater than 60 feet in length other than in an anchoring zone;
 - (g) jet skis and hovercraft;
 - (h) water skiing, except in a water-ski zone;
 - (i) the dumping of refuse, abandoned vehicles, toxic or other wastes, bilges, oil and other petroleum products, pesticides and other items harmful to animals or plants, or unsightly items;
 - (j) the driving or riding of motor vehicles and bicycles other than on public roads declared under the Road Traffic Ordinance or in a parking zone; *Cap. 106*
 - (k) car parking except in a parking zone;
 - (l) the making of fires, other than in a portable stove or grill;
 - (m) camping except in a camping zone or with the prior written approval of the Director;
 - (n) erecting any structure unless authorized by the Director of Planning;
 - (o) playing a game to the discomfort of other persons;
 - (p) playing any musical instrument, radio, cassette player, record player, television or other item which produces or reproduces music, to the discomfort of other persons;
 - (q) operating a vessel in excess of 15 miles per hour unless within an aquatic sports or water-ski zone. (*Inserted by L.N. 18 of 1994*)
- (2) The following are prohibited within all nature reserves—
- (a) the taking of any animal or plant by any method on land or at sea, except to the extent permitted in any fishing zone;
 - (b) the taking of any artifact;
 - (c) the removal of sand, rock, coral, coral-rag or any calcareous substance;
 - (d) anchor damage to coral reef structures living or dead and associated marine plant and animal life;
 - (e) the anchoring of vessels greater than 60 feet in length other than in an anchoring zone;

- (f) water skiing, jet skis or hovercraft;
 - (g) the dumping of refuse, abandoned vehicles, toxic or other wastes, bilges, oil and other petroleum products, pesticides and other items harmful to animals or plants, or unsightly items;
 - (h) the driving or riding of motor vehicles and bicycles other than on public roads declared under the Road Traffic Ordinance or in a parking zone;
 - (i) car parking except in a parking zone;
 - (j) the making of fires, other than in a portable stove or grill;
 - (k) camping except in a camping zone or with the prior written approval of the Director;
 - (l) erecting any structure unless authorised by the Director of Planning;
 - (m) playing a game to the discomfort of other persons;
 - (n) playing any musical instrument, radio, cassette player, record player, television or other item which produces or reproduces music, to the discomfort of other persons.
- (3) The following are prohibited within all sanctuaries—
- (a) public access unless with the prior written approval of the Director in form NP1;
 - (b) the introduction either temporary or permanent of any domestic animal or any other animal or plant not indigenous to the site;
 - (c) the taking of any animal or plant by any method on land or at sea;
 - (d) the taking of any artifact;
 - (e) the destruction of, or damage or injury to, any animal or plant;
 - (f) the removal of sand, rock, coral, coral-rag or any calcareous substance;
 - (g) anchor damage to coral reef structures living or dead and associated marine plant and animal life;
 - (h) the anchoring of vessels greater than 60 feet in length other than in designated areas;
 - (i) water skiing, jet skis or hovercraft;
 - (j) the dumping of refuse, abandoned vehicles, toxic or other wastes, bilges, oil and other petroleum products, pesti-

cides and other items harmful to animals or plants, or unsightly items;

- (k) erecting any structure unless authorized by the Director of Planning.

(4) The following are prohibited within all areas of historical interest—

- (a) subject to any building preservation order made under the Physical Planning Ordinance, any alteration to the outward appearance of any structure that is not otherwise permitted by that Ordinance;
- (b) the taking of any animal or plant by any method on land or at sea;
- (c) the taking of any artefact;
- (d) the removal of sand, rock, coral, coral-rag or any calcareous substance;
- (e) anchor damage to coral reef structures living or dead and associated marine plant and animal life;
- (f) the anchoring of vessels greater than 60 feet in length other than in an anchoring zone;
- (g) water skiing, jet skis or hovercraft;
- (h) the dumping of refuse, abandoned vehicles, toxic or other wastes, bilges, oil and other petroleum products, pesticides and other items harmful to animals or plants, or unsightly items;
- (i) erecting any structure unless authorized by the Director of Planning.

Cap. 73

(5) No person, other than a Park Warden acting in the course of his duties, shall use or have in his possession within a national park, nature reserve, sanctuary or area of historical interest any type of firearm, air gun, spear gun, cross bow, bow and arrow or other similar weapon.

(6) Subject to sub-regulations (1), (2) and (4), the following are permitted within national parks, nature reserves and areas of historical interest—

- (a) pedestrian access routes designated by the Director;
- (b) vessels, subject to—
 - (i) their not entering the swimming zones except if they are rescue vessels, Fisheries vessels, police vessels, or DOE vessels engaged in placing, repairing, replacing or removing fixed DOE buoys or performing rescue, but provided that persons involved in such operations cause no unnecessary damage to the envi-

ronment within the zone and that the vessels leave the swimming zone upon completion of the operation within the zone;

- (ii) their not depositing on the land or in the water of the national park nature reserve or area of historical interest any refuse, waste produce or other item or substance which does or is likely to diminish or restrict the enjoyment of the amenities of the national park, nature reserve or area of historical interest; and
 - (iii) the occupants of such vessel committing no other breach of these Regulations;
- (c) anchoring on clear sandy bottom, provided sub-regulations (1) (f), 2 (e) and 4 (f) are not contravened.

Rescue vehicles
and vessels

4. The Director may, in writing, approve any—

- (a) motor vehicle to be used as a rescue vehicle;
- (b) motor vessel to be used as a rescue vessel;

within any national park, nature reserve, sanctuary or area of historical interest.

Emergencies

5. No prohibition on anchoring imposed by these Regulations shall apply in an emergency, during the currency of a hurricane warning or when permission is given by the District Commissioner or Harbor Master to a specific vessel in circumstances which, in the opinion of such person, constitute an emergency.

Zones

6. (1) The Director may establish within a national park or nature reserve, the following zones exclusively for the purposes permitted within such zones—

- (a) swimming zones, where—
 - (i) bathing, swimming, snorkelling and scuba diving other than from a vessel, beach games and other ancillary pursuits are permitted;
 - (ii) all vessels, including engineless vessels, except those exempt in regulation 3 (6) (b), are prohibited;
- (b) access lanes where—
 - (i) access and egress by vessels and vehicles, other than those specifically prohibited from use within the national park or nature reserve, are permitted to and from the shore for the purpose of launching, recovery, loading, unloading, embarkation and disembarkation of such vessels;

- (ii) a vessel or vehicle speed in excess of 5 mph and access or egress other than at right angles to the shoreline is prohibited;
- (c) aquatic sports zones where sailing, windsurfing, canoeing, kayaking, swimming, snorkeling, scuba diving from a vessel and other ancillary activities are permitted;
- (d) training zones where the training of persons for scuba diving or snorkeling is permitted;
- (e) water-ski zones not less than 100 yards from a shoreline where the use of water skis and aqua slide equipment for sport, and the transit of all vessels including engineless vessels is permitted;
- (f) anchoring zones where the anchoring of vessels greater than 60 feet in length is permitted;
- (g) camping zones where camping is permitted;
- (h) parking zones for the purpose of parking vehicles while in the proximity of a national park, nature reserve or area of historical interest;
- (i) entry right of ways for the purpose of providing controlled access to a national park, nature reserve or area of historical interest;
- (j) fishing zones where, subject to the Fisheries Protection Regulations, non-commercial recreational fishing from the shoreline or from the piers or jetties within the zone is permitted, using light tackle of not more than 30 pounds breaking strain.

Cap. 104

(Amended by Legal Notice 18 of 1994)

(2) There are established within the national park, nature reserve, sanctuary or area of historical interest specified in the first column of Schedule II the zones described opposite thereto in the second column of the Schedule.

(3) The Director may, subject to any conditions specified by him, establish within the same area of a national park or nature reserve all or any combination of the zones mentioned in sub-regulation (1). (*Inserted by L.N. 18 of 1994*)

7. A dive vessel or charter vessel shall only be permitted within a national park or nature reserve subject to the conditions that—

Dive vessels and
charter vessels

- (a) the owner or operator of the vessel applies in form NP2 for a licence in form NP3 permitting him to operate within the national park or nature reserve;
- (b) the vessel moors only to fixed DOE buoys approved by the Director;

- (c) the vessel does not enter the swimming zones unless permitted under regulation 3(6)(b)(i);
- (d) the vessel anchors only in clear sandy bottom; and
- (e) the owner or operator of the vessel pays the fees referred to in regulation 10.

Provisions as to
new and existing
buoys and
leasing of buoys
Cap. 165

8. (1) Subject to the terms of a Development Order made under the Encouragement of Development Ordinance before the date of commencement of these Regulations, from that date—

- (a) no buoys shall be installed before prior approval in writing has been obtained from the Director;
- (b) buoys approved under paragraph (a) shall become the property of the Crown; and
- (c) no anchoring shall be permitted within 300 feet of a dive site mooring buoy.

(2) An individual, or owner or operator of a dive vessel or charter vessel, may apply to the Director in form NP4 to lease single-user buoys that are not dive site mooring buoys.

Specimen and
artifact
collection

9. Notwithstanding regulation 3, the Director may grant a written permit to scientists to collect—

- (a) animal and plant specimens within a national park, nature reserve, sanctuary or area of historical interest;
- (b) artifacts from a national park, nature reserve or area of historical interest;

subject to any conditions specified in the permit relating to the maximum number of specimens or artifacts that may be so collected and the prohibition or restriction of their export.

Fees

10. (1) The Minister responsible for the Ordinance shall, not more than once a year, approve a tariff of fees to be charged—

- (a) for the issue of a permit pursuant to regulation 3(3)(a) or regulation 9;
- (b) for the making an application under regulation 7(a) or 8(1);
- (c) for the lease of a single-user buoy pursuant to regulation 8(2);
- (d) to an owner or operator of a dive vessel or charter vessel operating within a national park or nature reserve;
- (e) to a dive operator for each scuba dive or snorkel trip made by clients of such operators; and

- (f) for such other activity carried on for gain within a national park or nature reserve as the Minister may determine.
- (2) The fees referred to in—
 - (a) sub-regulation (1) may, from time to time, be published by notice in the *Gazette*, but liability for their payment shall not depend on such publication;
 - (b) sub-regulation (1)(d) shall be chargeable in advance in relation to the length of the vessel used and payable by crossed cheque to the Director;
 - (c) sub-regulation (1)(e) shall be chargeable in arrears in relation to the number of divers using a specified dive site per year and payable by crossed cheque to the Director before the 1st January of the succeeding year.

(3) The owner or operator of a dive vessel or charter vessel shall, in making payment under sub-regulation (2), furnish the Director with a return in form NP5A or NP5B, as appropriate. (*Substituted by L.N. 18 of 1994*)

11. Regardless of whether a tariff of fees has been approved under regulation 10(1), every owner or operator of a dive vessel or charter vessel operating within a national park or nature reserve shall, within seven days of the end of the preceding calendar month, make a return in respect of that month in form NP5A or NP5B, as appropriate. (*Inserted by Legal Notice 18 of 1994*)

Returns

12. (1) These Regulations shall be enforced by Park Wardens appointed by the Governor, after considering recommendations made by the Director.

Enforcement

(2) Any person appointed as a Police Officer and any person appointed as a Fisheries Officer shall be deemed to be a Park Warden for the purpose of these Regulations.

(3) A Park Warden or officer referred to in subsection (2) shall have the power—

- (a) to enter all parts of a national park, nature reserve, sanctuary or area of historical interest for the purpose of preventing the commission of an offence under regulation 13;
- (b) to arrest without warrant any person committing such offence or whom the Park Warden or officer reasonably suspects to be committing, to have committed or be about to commit such offence; and

- (c) to seize any article, item or thing of whatever kind that he reasonably suspects has been used in the commission of such offence until the determination of proceedings in respect of that offence.

(Substituted by Legal Notice 4 of 1994)

Offences and
penalties

13. (1) A person contravening regulations—

- (a) 3(1) (d), (e) or (i);
- (b) 3(2) (c), (d) or (g);
- (c) 3(3);
- (d) 3(4) (c), (d), (e) or (h); or
- (e) 3(5);

commits an offence and is liable on summary conviction to a fine of \$50,000 or a term of imprisonment of 12 months or both.

(2) A person contravening any other provision of these regulations that imposes a duty of compliance, commits an offence and is liable on summary conviction to a fine of \$5,000 or a term of imprisonment of six months or both;

(3) If an offence under subregulation (1) or (2) is a continuing one, the person convicted of it is liable to a further fine not exceeding \$100 for every day or part of a day on which the offence has continued.

(4) The court before which any person is convicted of an offence under this regulation may order—

- (a) the forfeiture to the Government of any item, article or thing used in the commission of the offence;
- (b) that the person so convicted pay the cost of repairing any damage to a national park, nature reserve, sanctuary or area of historical interest caused by the commission of such offence.

(5) An item, article or thing forfeited pursuant to sub-regulation (4) (a) shall be destroyed, unless the Governor in Council directs that it be disposed of in some other specified manner.

SCHEDULE I
FORMS

FORM NP 1

NATIONAL PARKS REGULATIONS

PERMIT FOR ACCESS TO SANCTUARY

..... [Name of applicant(s)]

of [Address in Islands]

.....
.....
.....

is hereby granted permission to enter

..... [Name of Sanctuary]

between the following dates

..... [Start date]

..... [End date]

subject to the provisions of the National Park Regulations and subject to the following conditions—

1. This permit must be carried at all times by the holder during the exercising of permission granted herein.

2.
.....
.....
.....
.....
.....
.....
.....

Given at Grand Turk this day of 19/20.....

DIRECTOR OF ENVIRONMENT, HERITAGE AND PARKS

FORM NP 2

NATIONAL PARKS REGULATIONS

**APPLICATION FOR LICENCE TO OPERATE
DIVE/CHARTER VESSEL IN A NATIONAL PARK**

1. Name, address in the Islands and telephone number of Applicant

[If the Applicant is not a Belonger within the meaning of the Immigration Ordinance, the Applicant must provide details of his passport, his immigration status in the Turks & Caicos Islands and particulars of his Bank or a reference from a Bank which is established in the Islands]

2. Licence required

I hereby apply for the issue to me of a licence to operate a Dive/Charter vessel in the National Park in accordance with the provisions of the National Parks Regulations, for a period of SIX months / TWELVE months*

3. Particulars of vessel to be used

[Give full details and evidence of its being seaworthy and properly equipped; date and particulars of last marine survey to be given if the vessel is not ordinarily based in the Islands]

4. Particulars of crew

[Give name, qualification and address of master or other person in charge of vessel]

5. Security for payment of Fees

[Security offered for payment of fees becoming due in respect of operations by the Applicant under the licence]

6. Other Information

[Any information offered to enable the Director to satisfy himself as to the suitability of the Applicant]

7. Address for Service

If the Applicant is a body corporate, partnership or association of persons full details must be provided, including registered address in the Islands for service of documents or notices.

Signature or common seal of Applicant.

Dated the.....day of 19/20.....

** Delete as necessary*

Note: This application must be submitted in duplicate and delivered or sent by registered post to the Director at the Department of Environment, Heritage and Parks.

FORM NP 3

LICENCE TO OPERATE DIVE/CHARTER VESSEL

* of.....
 is hereby authorised to operate a DIVE/CHARTER vessel in the
 National Park Nature Reserve in accordance with the National Parks Regulations subject to the following:—

1. Particulars of vessel

(Name, number or other identification)

2. Period of licence

(Insert dates. Licences can be for six months or 12 months.)

3. Licence to be carried on vessel

The licence shall at all times be carried on the vessel to which it relates, and shall be produced for inspection by the Master or other person in charge on demand made by any person empowered to enforce the National Park Regulations.

4. Cancellation of licence

(a) The Director may cancel any licence if he is satisfied that the licensee has supplied any false information to procure the issue of the licence or has committed any material breach of the Regulations or used any vessel or equipment which is unsafe or unlawful.

(b) When a licence is cancelled no part of any fees paid for the licence shall be repayable.

5. Failure to pay fees

A licence shall lapse forthwith if the licensee fails to pay the fees due therefor on the due date or dates.

6. Inspection of licensee's records of operation

The licensee shall at all reasonable times provide facilities for any person authorised by the Director to inspect any records kept by the licensee as to his operations under the licence and in particular those records which are relevant to the calculation of the fees payable for the licence.

Given at Grand Turk this day of.....19/20.....

DIRECTOR OF ENVIRONMENT, HERITAGE & PARKS

* A licence may be issued to an individual, a partnership, a body corporate or an association of persons. The licence should state the capacity or status of any such and in the case of a body corporate should state the country in which it is incorporated.

FORM NP 4

NATIONAL PARKS REGULATIONS

**APPLICATION TO LEASE A SINGLE-USER BUOY
IN A NATIONAL PARK OR NATURE RESERVE**

1. Name, address in the Islands and telephone number of Applicant

[If the Applicant is not a “Belonger” within the meaning of the Immigration Ordinance, the Applicant must provide details of his passport, his immigration status in the Turks & Caicos Island, and particulars of his Bank or a reference from a Bank which is established in the Islands]

2. Name required

I hereby apply for the issue to me of a lease for the sole use of a mooring buoy within the National Park/Nature Reserve in accordance with the provisions of the National Parks Regulations, for a period of SIX/ TWELVE months

3. Particulars of mooring buoy required

[Give location and other details of buoy for which lease is required]

4. Particulars of vessel to be used

[Give full details of vessel including Name and Identification Number, length and displacement]

5. Particulars of crew

[Give name, qualification and address of Master or other person in charge of vessel]

NOTE: This application must be submitted in duplicate and delivered or sent by registered post to the Director at the Department of Environment, Heritage and Parks.

SCHEDULE II*(Section 6(2))***ZONES**

National park, nature reserve, sanctuary or area of historical interest	Zones
1. Princess Alexandra National Park	(1) Aquatic sports, swimming and training zones comprising the area between low water mark and a line situated 100 yards offshore from low water mark, running parallel to the shore and situated in:- (a) the Turtle Cove Area, from the western boundary of Babaloo Beach at Grid reference YV 862 115 to the Eastern boundary of the Provident/Turtle Cove Park (YV 867 118); (b) the Princess Sheraton Area, from the western boundary of the Sheraton Hotel site (YV 896 119) to the eastern boundary of the Island Princess Hotel site (YV 900 122); (c) the PDM Beach area from YV 906 127 to YV 908 129; (d) the Turquoise Area extending from the eastern boundary of the Ramada Hotel site (YV 920 130) to the eastern boundary marker of the Club Med Hotel site (YV 928 138). (2) Access Zones for the purpose of allowing entry and egress of boats (both power boats and sail and manually propelled boats). Each Access Zone will comprise an area 100 feet wide extending from the beach to a point 110 yards offshore from the low water mark. Access Zones will be situated at the following grid references:- YV 862 115, YV 872 116, YV 881 112N, YV 889 115, YV 900 122, YV 904 126, YV 907 128, YV 914 129, YV 919 130, YV 924 133, YV 927 138, YV 933 149.

- (3) A Swimming zone where swimming and snorkelling only are permitted. This zone will comprise the area between low water mark and a line situated 100 yards offshore from low water mark, running parallel to the shore. This zone will comprise the entire remaining coastal strip between Babaloo Beach (YV 862 115) and Leeward-Going-Through Point (YV 165 162).
- (4) A water-ski zone where water skiing, paragliding and similar activities using power-driven vessels will only be permitted. This zone will be bounded by a line perpendicular to the shore at the eastern boundary of the Ramada Hotel Site (YV 920 130) and a line perpendicular to the shore at the eastern boundary marker of the Club Med Hotel site (YV928 138) and comprising the entire area from a line situated 100 yards below low water mark and running parallel to the shore to a line situated 1000 yards below low water mark and running parallel to the shore.

Grid references are to sheet 3 series E8112 (DOS 309P) Edition 2-OSD 1985.

2. Columbus Landfall
Marine National
Park

A fishing zone situated between land parcel 10301/7 (Grid reference BP772 763) and land parcel 1 0 3 0 6 / 1 7 (Grid reference BP774 746). Grid references are to sheet 14 series E8112 (DOS 309P) Edition 2-OSD 1985.

A fishing zone situated between land parcel 10301/7 (Grid reference BP772 763) and land parcel 1 0 3 0 6 / 1 7 (Grid reference BP774 746). Grid references are to sheet 14 series E8112 (DOS 309P) Edition 2-OSD 1985.

DESIGNATION OF PUBLIC PARKS GRAND TURK*(Gazette Notice 198/1993)*

The Executive Council at its meeting held 17th March, 1993 approved the undermentioned areas in Grand Turk as areas which are designated for public purposes and for use by the general public as parks.

- (1) 10204/211 & 212 Columbus Park – An area adjacent to the South of the Guanahani Beach Hotel.
- (2) 10304/123 Front Street Park – An open space partly enclosed in front of the Churchill Building.
- (3) 10306/51 Gunners Terrace Park – A strip of land along the beach South Suburbs generally used by residents to secure their small boats.
- (4) 10307/22 Close Haul Road Park – An area of land containing a cedar Grove that was planted approximately fifteen years ago and is used by residents of Palm Grove.
- (5) 10308/202 &
10501/39 & 42 Palm Grove Park – Open space comprising land within the Palm Grove and Caution Curve area.
- (6) 10402/13 Overback Park – The area fenced and an additional area to the South for expansion frequently used by the children.
- (7) 10402/11 Island Park – An island within the town Salinas with an area of approximately 9.67 acres.
- (8) 10409/145 Osbourne Road Park – An area of approximately 3.5 acres adjacent to the Eliza Simons Primary School.
- (9) 10503/1, 65 (pt) Governors Beach Park – An area of approximately 0.80 acres adjacent to Waterloo and used for picnic outings.
- (10) 10505/43 Hawks Nest Park – An area of land to the Southern end of Grand Turk.

INDEX

	Page
Grand Turk	
Public parks defined	39
Historical	
Interest	
Areas	
Declared	19
Prohibited activities	26
National	
Parks	
Declared	9
Dive vessels in	28
Prohibited activities	23
Restricted activities	6
Usage of	4
Zones for aquatic use	37
Nature	
Reserves	
Declared	14
Prohibited activities	24
Sanctuaries	
Declared	18
Prohibited activities	25



Lights Out!

What's the Problem with Beach Lighting?

Sea turtle hatchlings find the water by orienting themselves to the brightest and most open horizon, which, under natural conditions, will be the Caribbean Sea and the Atlantic Ocean. In the presence of artificial light, hatchlings become confused and disoriented and wander away from the sea towards the artificial lighting. Lost and disoriented, the hatchlings soon die from dehydration, heat exhaustion, predation or from being crushed on nearby streets. Beach lights appear brighter to sea turtles than to humans. These lights attract the hatchlings when they emerge from their nests in the sand and making their way to the water quickly.



Why are hatchlings attracted to artificial lighting?

Hatchlings crawl toward artificial light sources, because they follow the same instincts that lead them seaward to beaches that are lit naturally. The hatchlings are usually led by the brightness and glare of the artificial lights.

How does artificial lighting affect nesting turtles?

Artificial lighting is a deterrent, but still many sea turtles do nest on lit beaches. The level of lighting necessary to deter nesting is higher than the level necessary to misdirect hatchlings. Even if no nesting occurred on lit beaches, hatchlings on adjacent beaches could be harmed.

Why should I modify the lights near my beachfront property?

Any lowering or reducing of lights around a nesting beach helps the turtles. As lighting is reduced, hatchlings emerging on moonlit nights and at locations far from lit beach property will have a better chance of surviving.



How can the needs of human beings and sea turtles be met?

Human safety and security can be ensured without endangering sea turtles. The aim is to manage light so that it doesn't reach the nesting beach. This helps to reduce sea turtle harassment and mortality. Since sea turtles are a valuable resource, the protection of them is in our best interest.



What should be done with misdirected hatchlings?

Hatchling sea turtles found moving away from the ocean should be directed to a dark spot on the beach and allowed to walk into the surf on their own. Sluggish hatchlings can be placed into the ocean and allowed to swim away. However, handling hatchlings should always be a last resort.

How you Can Help!

- Turn off all lights that shine directly across the beach or lights that are visible from the beach from 9 p.m. to 6 a.m. during the nesting season April 1st to November 30th.
- Do not place any lighting regardless to wavelength between turtle nests and the sea.
- Turn off lights in rooms if you see a female turtle crawling onto a beach or digging a nest, remain quietly in the dark at a distance. Allow her enough room to return safely to the sea.
- Please do not build fires on the beach from April 1st to November 30th.
- Turn off lights in rooms that are not in use. Reminder notices on switches can help this effort.
- Relocate moveable lamps away from windows that are visible from the beach.
- Tint or treat windows that are visible from the beach so that light passing from inside to outside is reduced.
- Close curtains or blinds after dark to cover windows visible from the beach.
- Use light sources that turtles see poorly. (See the list on the next flap.)
- Plant native plants on the dune, since the plants will grow and enhance the dune habitat for other animals, and provide natural cues for the orientation of hatchlings.



These are just some measures that can be taken to reduce the effects of lighting on hatchlings. The most important measure to take is to use natural or artificial structures rising above the ground to the maximum extent to prevent the lighting from directly lighting the beach/dune system and to buffer noise and conceal human activity from the beach.

Artificial Light Types and their Effects

White, broad based-spectrum, short arc lighting (**extremely disruptive**). Types: Xenon and mercury arc lamps.

White, broad-spectrum, electric-discharge lighting (**extremely disruptive**). Types: Mercury-vapour, metal-halide and fluorescent type lighting.

Colour-phosphor and tinted-fluorescent lighting "blacklight" ultraviolet, violet, blue, green and mixtures of these colours (**extremely disruptive**).

White, broad-spectrum, incandescent lighting (**extremely disruptive**). Types: The common light bulb, flashlights, lanterns.

Colour-tinted incandescent lighting (blue and green) (**extremely disruptive**).

White pressurized fuel, glowing element lanterns (**extremely disruptive**). Types: Portable lanterns used for outdoor nighttime activities.

High Pressure sodium vapour (HPS) lighting (**highly disruptive**). This category is most commonly used for our door lighting.

Open fires (**moderately to highly disruptive**). This is dependent on the size and temperature.

Yellow-phosphorous and amber-tinted fluorescent lighting and red tubes (**moderately disruptive**).

Lamps with yellow or orange dichroic long-pass filters (**minimally to moderately disruptive**).

Colour-tinted incandescent lighting (yellow and red) (**minimally to moderately disruptive**). The yellow type in this category consists of bug lights.

Low-pressure sodium vapour (LPS) lighting (**minimally disruptive**). This is by far the least disruptive light source among those commonly used.

Red light-emitting diode (LED) lighting (**minimally disruptive**). These lights are miniature lamps that are not commonly used outdoors. These lights come close to being ideal for use near sea turtle nesting beaches.

Neon Tubes (**minimally disruptive**). True neon tubes (not tinted tubes) are a source of pure red light.

Neon tubes are sometimes difficult to shield, but their colour makes them minimally disruptive.

Transient light source (flashlights, electric torches, flash photography) (**disruptive characteristics vary**). This lighting is placed in a separate category because it is only in use for short periods of time. However, this light source has white incandescent lights and can be expected to affect sea turtles as the other sources do.

The types of lighting and their effects listed above can be very attractive to hatchlings and cause disorientation and death. Artificial lighting in close proximity to nesting beaches interferes with the ability of sea turtles to nest and the ability of hatchlings to find their way from their nest to the sea. This is so, because hatchlings can be misguided by the brightness of artificial light.

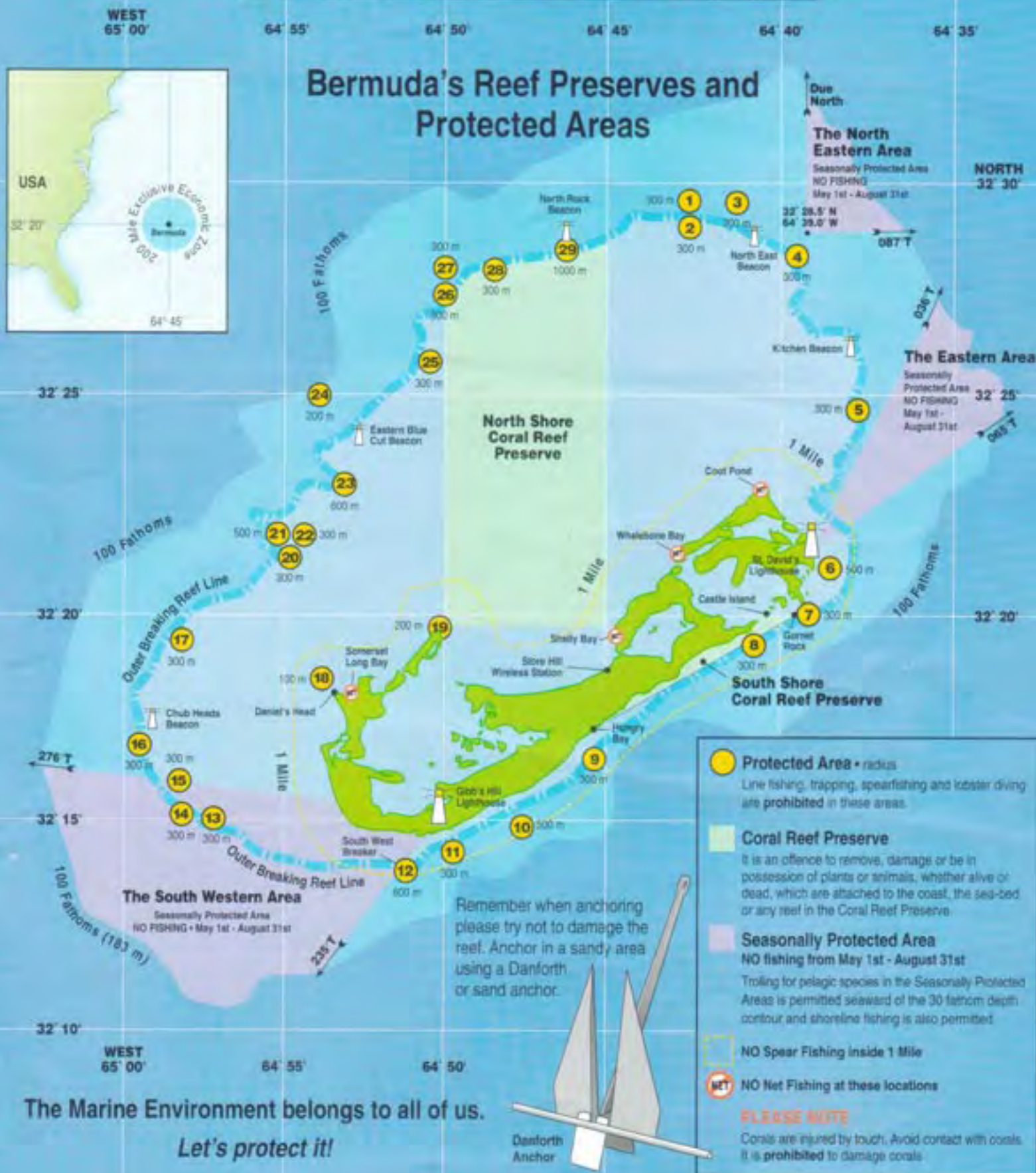
A good way to identify specific problem light sources is to conduct a series of nighttime beach surveys. The surveyor should walk the entire length of the beach at the tide line and recording artificial lighting sources. Any source that is visible from the beach should be recorded along with its location, appearance and methods for its correction. Since lighting problems may develop during the nesting season, a survey should also be conducted during this time. Surveys conducted prior to the nesting season will allow for the correction of the problem, and follow-up surveys during the season, to correct any problems that may be revealed.

Light management rather than light removal is the most realistic policy for developed nesting beaches. Property owners can rest assured that light management will allow them to direct light onto their property where it is needed as long as the light does not "leak" out onto the beach.



BERMUDA

ISLANDS





TURTLE ALERT

In the last few years the number of sea turtles killed through boat collisions has increased. Sea turtles must come to the surface every few minutes to breathe. This is when most collisions occur, as the turtles are unable to move out of the way of fast moving boats.

In order to prevent such accidents and protect these endangered animals, all boaters are encouraged to drive with extra care in the areas where the turtles live. The map overleaf should help you identify these areas.

Green Sea Turtles, which are the most common turtles found in Bermuda, feed on turtle grass. Turtle grass is found along much of the northern and western shores of the Island, where it extends out about 300 metres from the actual shoreline, as shown on the map. Where possible you are urged to travel outside these areas to avoid disturbing the turtles.

As a reminder to all boaters to keep a careful watch out for the sea turtles, the following sign is also being placed at various locations around the Island where sea turtles are most commonly found (see map overleaf).



Remember, if you slow down when travelling in these areas, you may well be rewarded with a close up look at one of these beautiful animals!

And, just a final reminder; turtle grass is not only important for sea turtles, but it is a very important nursery area for many of our reef fish, so please avoid anchoring in the turtle grass - find a sand hole nearby in which to drop your anchor!

There will be more information about safe anchoring in the Bermuda Moorings Initiative brochure, which will be mailed to you soon.

Closed Seasons for Marine Animals

(Strombus Gigas) Leaf Conch

1st December - 31st May



(Epinephelus Striatus) Nassau Grouper

30th November - 31st January



(Epinephelus Guttatus) Red Hind

1st January - 31st March



Marine Turtles

1st April - 30th November



Conclusion

Any one caught harvesting or practicing any of the methods mentioned on the previous page will be **PROSECUTED** in court at the maximum penalty.

Any one seen harvesting or practicing these **ILLEGAL** methods in the British Virgin Islands waters, should contact the Conservation and Fisheries Department immediately.



Contact Us:

Telephone

1-284-494-568/1-284-494-3429

Fax

1-284-494-2670

E-mail

cfd@bvlgovernment.org

VHF Channel 16

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Fishing Laws in the

British Virgin Islands

prepared by the
Conservation and Fisheries Department
Ministry of Natural Resources & Labour
Government of the British Virgin Islands



For further information on
Laws Regarding Fishing in the BVI,
visit the
Conservation & Fisheries Department
in the Quatsky Building
next to the Market Place
in Road Town.

In the

British Virgin Islands

it is **ILLEGAL** to:

- ⇒ Haul another person's fish traps/pots or fishing gear without permission from the owner.
- ⇒ Use **CAST NETS** with a mesh size of less than 3/16 inch.
- ⇒ Use a **BEACH SEINE** with a mesh size of less than 1.5 inches.
- ⇒ Use a **FLYING FISH NET** with a mesh size of less than 3/4 inch.
- ⇒ Use any fish trap/pot with a mesh size of less than 2 inches when measured across the narrow part.
- ⇒ Take any **LOBSTER** less than one pound in weight or which has a carapace or head of less than 3 inches. Neither should lobsters bearing eggs be harvested. Lobsters should immediately be returned to the sea. Lobsters should not be harvested with spear guns or hooks.
- ⇒ Harvest **CONCH** without a flared lip. Any conch without a flared lip is considered a juvenile. All harvested conch should be landed in the shell.

⇒ Use a fish trap or seine net to catch Currimole fish.

⇒ Use any **FISH TRAP/POT**, which does not have a biodegradable panel.

⇒ Use **SCUBA GEAR** to take any marine products (whether conch, fish, shells, lobster, coral, etc.)

⇒ Use **SPEAR GUNS** to harvest any marine products.

⇒ Harvest any type of **TURTLE** during the months of April to November.

⇒ Fish in British Virgin Islands waters without a valid fishing license or permit.

⇒ Fish in any Marine Protected Area.

Valid Fishing Licenses can be obtained from the

Ministry of Natural Resources & Labour.

Ministry of Natural Resources & Labour.

Ministry of Natural Resources & Labour.

Tel 284-468-3701 ext. 2147

Marine

Protected Areas

- ⇒ Horse Shoe Reef, Anegada
- ⇒ Hans Creek, Beef Island
- ⇒ South Sound, Taylor's Bay to Copper Mine, Virgin Gorda
- ⇒ The Sound, Salt Island
- ⇒ The Sound & Wedges Bay, Ginger Island
- ⇒ Big Reef, Peter Island
- ⇒ Green Cay, Jost Van Dyke
- ⇒ Money Bay, Santa Monica, Rock South West, and Norman Island
- ⇒ Dead Chest
- ⇒ Guana Island

TURTLES

There are two types of turtle found on planet Earth: land and sea. Here you can read all about the sea turtles that visit the BVI.



All turtles are reptiles, just like snakes and lizards. Of the eight different types of sea turtle found world-wide, three kinds are known to visit the B.V.I. annually - the Green, the Hawksbill, and the Leatherback.

Sea turtles don't come to the B.V.I. on vacation like people do, to bask in the sun on sandy beaches. They are aquatic animals that spend their entire lives in the ocean, feeding on things like sea grass, coral reef sponges or jellyfish; different turtle types have different dietary preferences. Only, the females make nightly visits to certain beaches to lay eggs in sandy nests, at specific times of the year.

A pregnant, adult female sea turtle will swim ashore and awkwardly pull herself up onto a beach that is wide, with few or no lights nearby. She will dig a hole in the sand that is several feet deep, deposit her fertilized eggs into the warm cavity and cover it over again. She will then re-enter the sea, knowing she will never see the babies hatch or help them grow up. The baby turtles will be independent from the moment they emerge from their shells, several weeks later, and head straight for the ocean as soon as they climb out of their nests.

Unfortunately, many baby hatchling turtles don't make it to the sea and adulthood, because of several factors. Turtle hatchlings are preyed upon by a myriad of animal predators like cats, dogs, mongooses, ghost crabs, snakes, and sea birds like gulls, who find the hatchlings make tasty treats. Another type of predator will assault the mother turtles, and even the babies in their nests before they hatch. That predator is man. Man has been known to 'harvest' adult turtles for their oil, shells, meat and blood, for food, medicine and decoration. People also believe that turtle eggs are good to eat as an aphrodisiac. The population is threatened, also, due to pollution and accidental drowning in deep sea fishing nets. Even garbage on the beach can trap the hatchlings, so they can't get to the sea before predators find them.



Rules for Cayman Islands Marine Parks

MARINE PARK ZONE

- No taking of any marine life alive or dead, except:
 - line fishing from shore is permitted (see FISHING LICENSES section over page);
 - line fishing at depths of 80 ft or greater is permitted;
 - taking fry and sprat with a fry or cast net is permitted.NOTE: fish traps, spear guns, pole spears and other nets are totally prohibited.
- No anchoring - use of fixed moorings only, except:
 - boats of 60 ft or less may anchor in sand, so long as no grappling hook is used, and neither the anchor nor the rope or chain will impact coral;
 - anchoring permitted in designated Port anchorage areas—contact Port Security VHF Channel 16;
 - anchoring prohibitions suspended during emergencies and by permission of Port Director.
- Bloody Bay, Little Cayman - Special restrictions have been placed on the use of the Bloody Bay Marine Park, no commercial operations may use the park without a licence from the Marine Conservation Board.

ENVIRONMENTAL ZONE

- No taking of any marine life, alive or dead with no exceptions;
 - No in-water activities;
 - Public may access only at speeds of 5 m.p.h. or less;
 - No anchoring of any boat.
- NOTE: Line fishing, fish traps, nets, spear guns and strikers are totally prohibited.

REPLENISHMENT ZONE

- No taking of conch or lobster by any means;
 - Line fishing (see FISHING LICENSES section over page) and anchoring permitted;
 - Anchor, chain or line must not touch coral;
 - Spear guns, pole spears, fish traps and nets prohibited, except that fry and sprat may be taken with a fry or cast net.
- NOTE: These zones include the outside edge of the reef to a depth of 20 feet.



DESIGNATED GROUPER SPAWNING AREAS

- East and West End of: Cayman Brac, Little Cayman and Twelve Mile Bank. Coxswain Bank and South West Point Grand Cayman.
- No fishing for Nassau Groupers in 2003 and during every alternate year after (ie 2005, 2007 etc);
- During open season only line fishing is permitted in these areas by Caymanians;
- No fish pots or spearfishing within one-mile radius of Designated Grouper Spawning Area from 1 November through 31 March.

ANIMAL SANCTUARIES/RAMSAR SITES

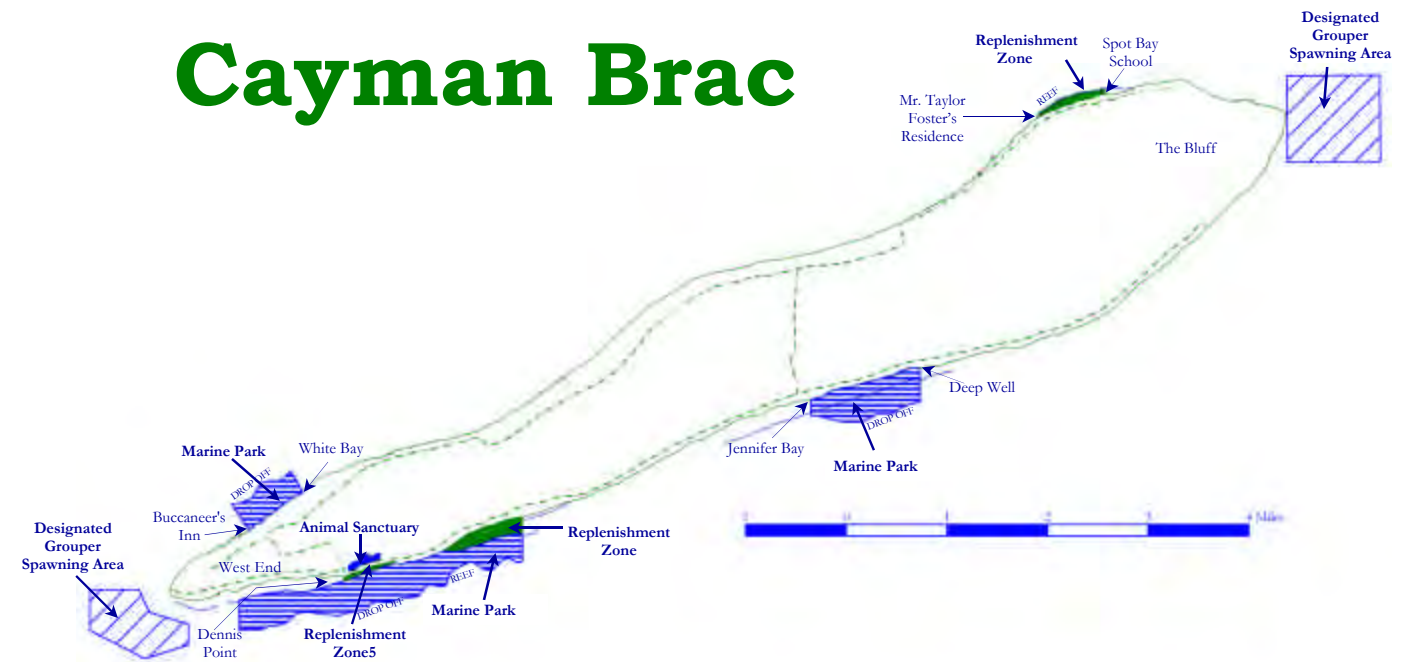
- No hunting,
- No collecting of any species,
- No littering.

 NO DIVING ZONE

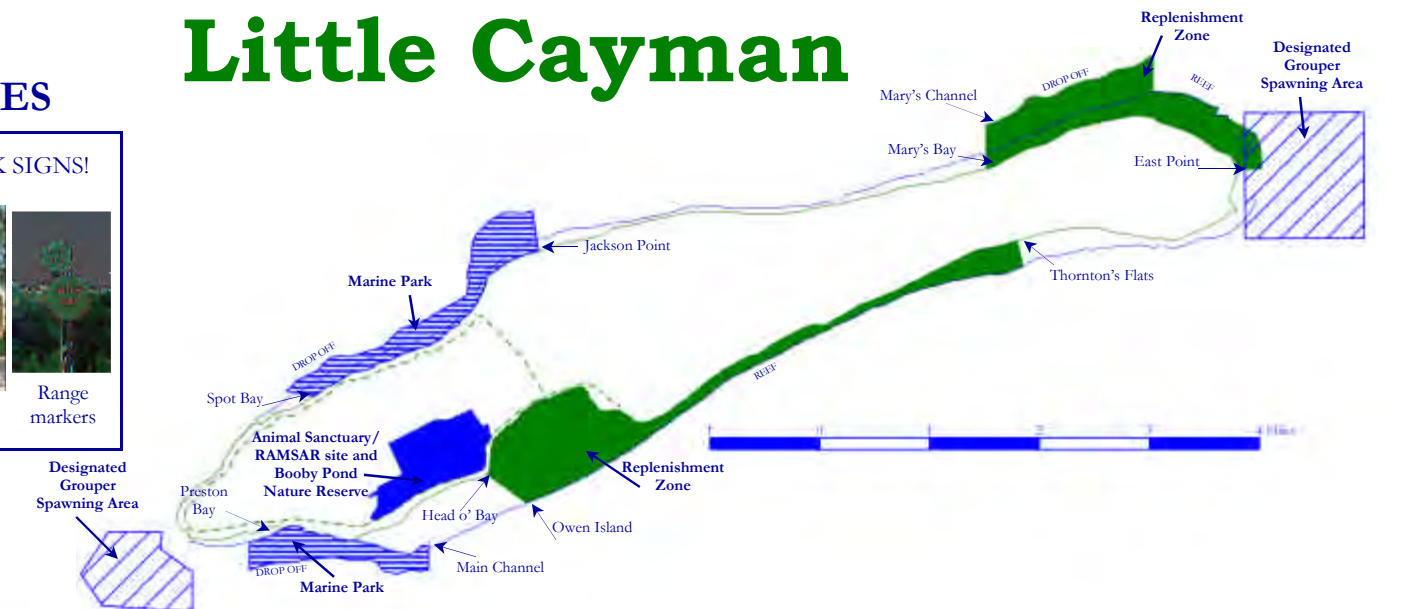
- No SCUBA diving.



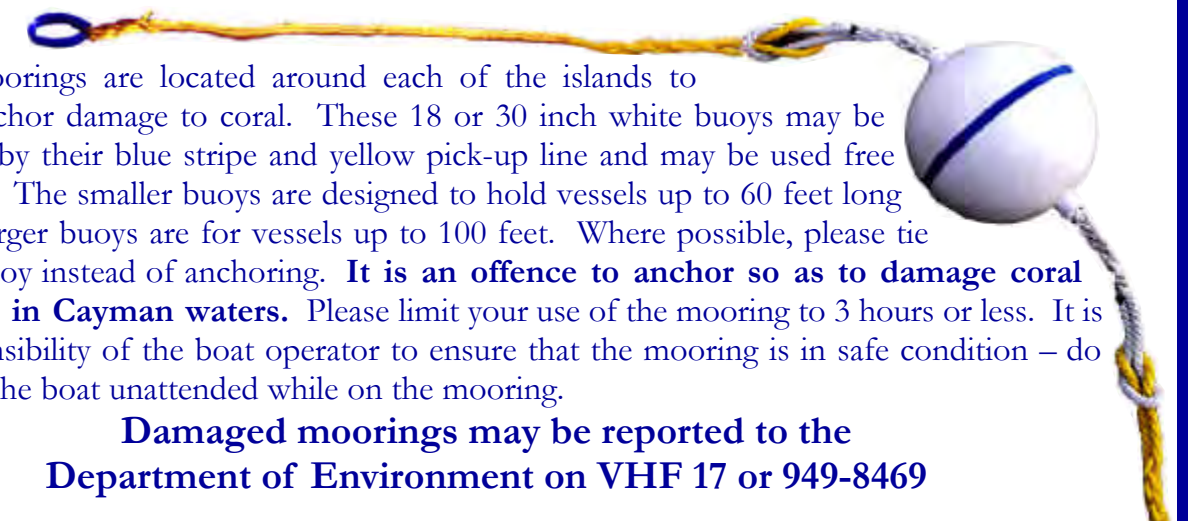
Cayman Brac



Little Cayman



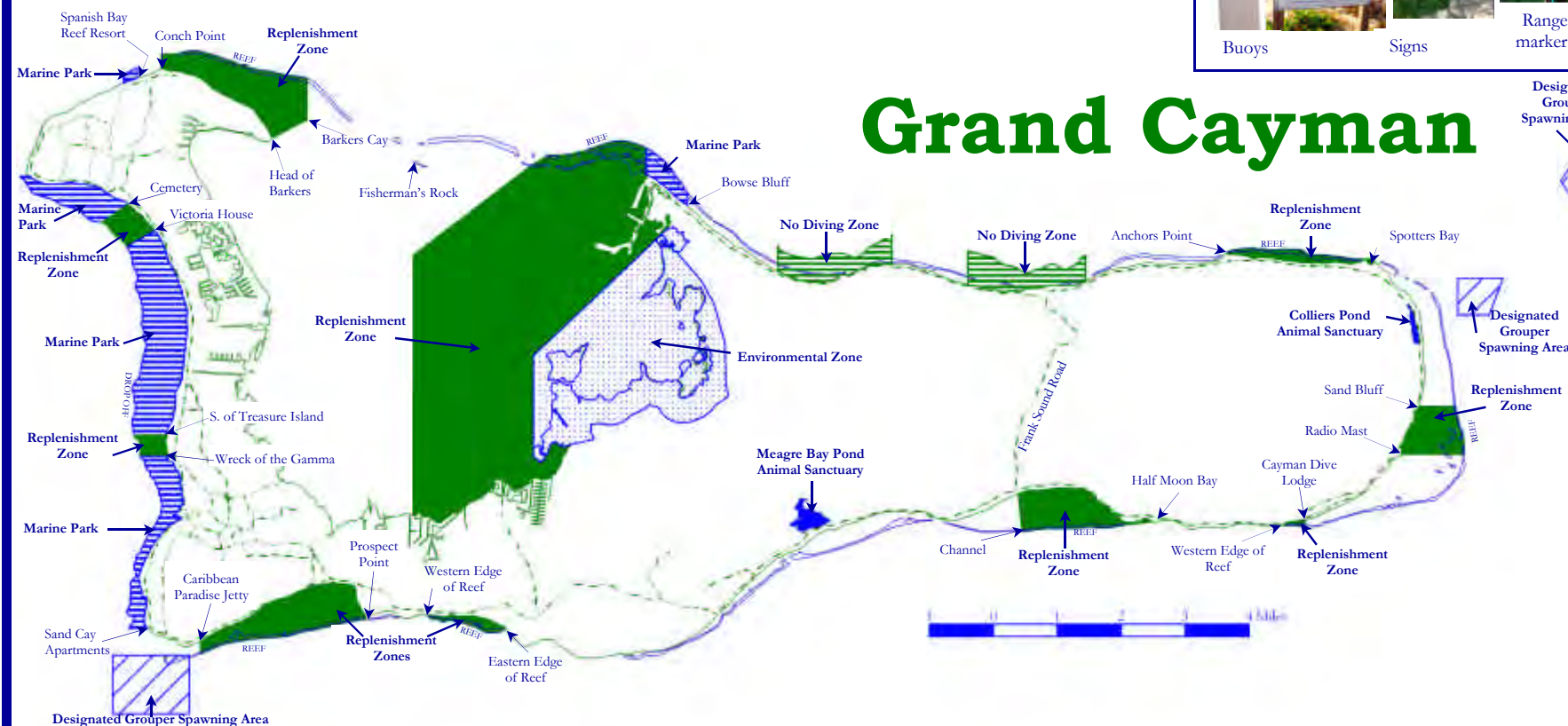
PUBLIC MOORINGS



Public moorings are located around each of the islands to reduce anchor damage to coral. These 18 or 30 inch white buoys may be identified by their blue stripe and yellow pick-up line and may be used free of charge. The smaller buoys are designed to hold vessels up to 60 feet long and the larger buoys are for vessels up to 100 feet. Where possible, please tie up to a buoy instead of anchoring. **It is an offence to anchor so as to damage coral anywhere in Cayman waters.** Please limit your use of the mooring to 3 hours or less. It is the responsibility of the boat operator to ensure that the mooring is in safe condition – do not leave the boat unattended while on the mooring.

**Damaged moorings may be reported to the
Department of Environment on VHF 17 or 949-8469**

Grand Cayman



SUMMARY OF CAYMAN ISLANDS MARINE CONSERVATION LAWS

LOBSTERS

- **Closed season:** 1 March through 30 November. No one may take lobster from Cayman waters during these months. No one may purchase, receive or possess lobster taken from Cayman waters during these months.
- **Open season catch limit:** Three per person or six per boat per day, whichever is less.
- **Size limit:** Six inch tail minimum size.
- Only spiny lobster (*P. argus*) may be taken.

CONCH

- **Closed season:** 1 May through 31 October. No one may take conch from Cayman waters during these months. No one may purchase, receive or possess conch taken from Cayman waters during these months.
- **Open season catch limit:** Five per person or ten per boat per day, whichever is less.
- No one may purchase or receive more than five conch from Cayman waters in any one day.

WHELKS

- **Closed season:** 1 May through 31 October. No one may take whelk from Cayman waters during these months. No one may purchase, receive or possess whelk taken from Cayman waters during these months
- **Open season catch limit:** Two-and-a-half gallons in the shell or two-and-a-half pounds of processed whelks per person per day.
- No one may purchase or receive more than two-and-a-half gallons in the shell or two-and-a-half pounds processed whelks from Cayman waters in any one day.
- Chitons, periwinkles and bleeding teeth may not be taken from Cayman waters at any time.

ECHINODERMS

- Echinoderms (includes starfish, sea eggs/urchins, sea cucumber, sand dollars etc) may not be taken from Cayman waters at any time.

TURTLES

- No one may disturb, molest or take turtles in Cayman waters without a licence from the Marine Conservation Board.
- Possession of turtle eggs is prohibited.
- For licensed fishermen, closed season runs from 1 May through 31 October.

SHARKS

- No one may feed, attempt to feed or provide or use food to attract any shark in Cayman waters.

NASSAU GROUPERS

- **Designated Grouper Spawning Areas are protected.**
- **Closed season:** 1 January through 31 December 2003 and every alternate year thereafter (i.e. 2005,2007,2009 etc.).
- **Open season catch limit :** (2004, 2006, 2008 etc.) twelve grouper per person or per boat per day applies in these areas.
- During open season, only line fishing is permitted in these areas by Caymanians.
- **Size limit:** Twelve inch minimum size limit applies throughout Cayman waters year round.

OTHER FISH

- **Protected fish:** Jew fish, tilefish (whities), filefish (pipers) and angelfish, including Grey, French and Queen angels (old monks), may not be taken from Cayman waters at any time.
- **Size limit:** Eight-inch minimum size on all other fish except goggle eyes, herrings (including sprats), anchovies and silversides (including loggerhead and fine fry).

FISH POTS

- Must be licensed by the Marine Conservation Board
- Only Caymanians over 18 may be granted licences.
- Only two pots per family and pots must be identified with a DOE tag.
- No fish pot may be set within a one–mile radius of any Designated Grouper Spawning Area from 1 November through 31 March.

SPEAR GUNS & SEINE NETS

- No one may use a speargun (includes Hawaiian sling, polespear, harpoon, hookstick or any device with a pointed end which may be used to impale, stab or pierce any marine life but does not include a striker) or seine net without a licence from the Marine Conservation Board. NOTE: A striker is defined as a wooden pole, no shorter than 10 feet, with a maximum of 2 barb-less prongs attached to one end.
- No one may possess a speargun without a licence.
- No one may import a speargun or any parts for a speargun.
- Only Caymanians over 18 may be granted licences.
- **Speargun catch limit:** Three fish per licensed person per day.
- No one may possess more than six fish that have been caught by a speargun.
- No one may spearfish within a one–mile radius of any Designated Grouper Spawning Area from 1 November through 31 March.

FISHING LICENSES

- Unless licensed by the Marine Conservation Board, residents who do NOT possess Caymanian Status may not take or attempt to take, by any means, any marine life while he is on shore or in any part of Cayman waters in which he can stand.
- No licence is required for catch and release fishing.

GENERAL RULES

- Damaging coral by anchor, chains or any other means **ANYWHERE** in Cayman waters is prohibited.
- No taking of **ANY** marine life alive or dead while on SCUBA.
- No taking of any coral, sponges, etc. from Cayman waters.
- Wearing gloves while diving or snorkelling in Cayman waters is prohibited.
- Export of live fish or other marine life is prohibited.
- Fishing with gill nets, poison or other noxious substances is prohibited.
- Dumping **ANYTHING** in Cayman waters is prohibited.
- The export of conch shells and or black coral requires a CITES permit, issued through the DOE.

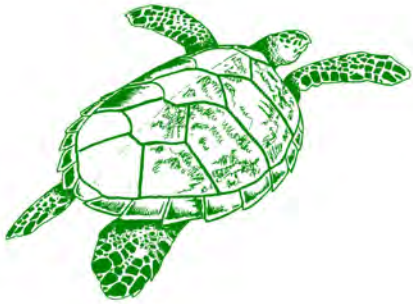
PENALTIES

Violation of any of these laws is an offence carrying a maximum penalty of CI\$500,000 fine and one year in jail. Upon conviction, forfeiture of the vessel or other equipment may also be ordered.

Call for further information
Department of Environment
580 North Sound Way, Grand Cayman.

Phone: 949-8469 Fax: 949-4020
Cayman Brac: 926-0136
Little Cayman: 926-0135
VHF: Channel 17

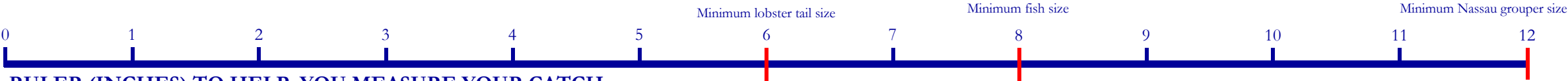
Report offences to VHF 17, 948-6002 or 911
Report oil spills or other marine
pollution to the DOE 949-8469 or 911
WEBSITE: www.gov.ky/doe
EMAIL: doe@gov.ky



Marine Park
Regulations
& Marine
Conservation
Laws
Cayman Islands



Department
of Environment



RULER (INCHES) TO HELP YOU MEASURE YOUR CATCH

TCOT GENETIC SAMPLING DATA SHEET

Please complete this data sheet whenever taking a genetic sample. Give the sample a unique code and write the sample code ***in pencil*** on a slip of paper. Insert the slip into the vial with the sample and mark the vial with sample code. Please store this master and send a copy of this sheet with the sample. While tissue samples in TCOT vials can be stored at room temperature, please store samples in a refrigerator when possible.

SAMPLING PROTOCOL - Sample only from fresh specimens when the location and approximate date of capture is known.

Live turtles - the biopsy punches should only be used on live turtles. Take skin samples from the soft skin around the limbs. Cut a shallow, circular incision with the punch and slice off the circular sample of the surface of the skin using a scalpel. Immediately place the sample in a vial. Safely discard the scalpel after use. Thoroughly boil and re-use the biopsy punch.

Dead turtles - take muscle or skin samples of at least 1cm² using a sterile scalpel. Immediately place the sample in a vial. Safely discard the scalpel after use.

For more information on genetic sampling and measuring, refer to FitzSimmons et al and Bolton in *Eckert, K. L., K. A. Bjorndal, F. A. Abreu-Grobois & M. Donnelly (Editors) 1999. Research and Management Techniques for the Conservation of Sea Turtles. IUCN/SSC Marine Turtle Specialist Group Publication No.4.*

SAMPLE CODE:

Name: Address Telephone: E-mail:	Date sampled: Specimen Alive ☐ or Dead ☐ Species (if known) Sex ☐ Male ☐ Female ☐ Unknown If known, how was sex determined?

BIOMETRIC MEASUREMENTS

(Please record as much information as possible. See diagram on reverse for CCLn-t/ SCLn-t measurement points)

Curved carapace length CCLn-t (cm)	Curved carapace width CCW (cm)	Straight carapace length SCLn-t (cm)	Straight carapace width SCW (cm)	Front flipper length (cm-wrist to flipper tip along leading edge)	Straight plastron length PL (cm)	Head width (cm-measure at the widest point)

GENETIC SAMPLING DETAILS

Location sampled (give coordinates for released turtles)	Body part sampled (also indicate on diagram on reverse)

TAGGING DETAILS

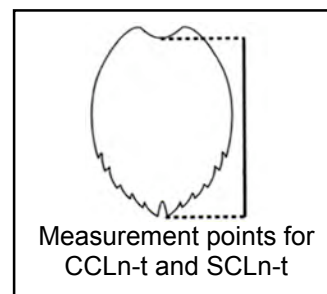
Had the turtle previously been...	Tag location	Tag number and type	On sampling, was the turtle...	Tag location	Tag number and type
... flipper tagged? Yes ☐ No ☐			... flipper tagged? Yes ☐ No ☐		
...PIT tagged? Yes ☐ No ☐			...PIT tagged? Yes ☐ No ☐		

TURTLE CAPTURE DETAILS

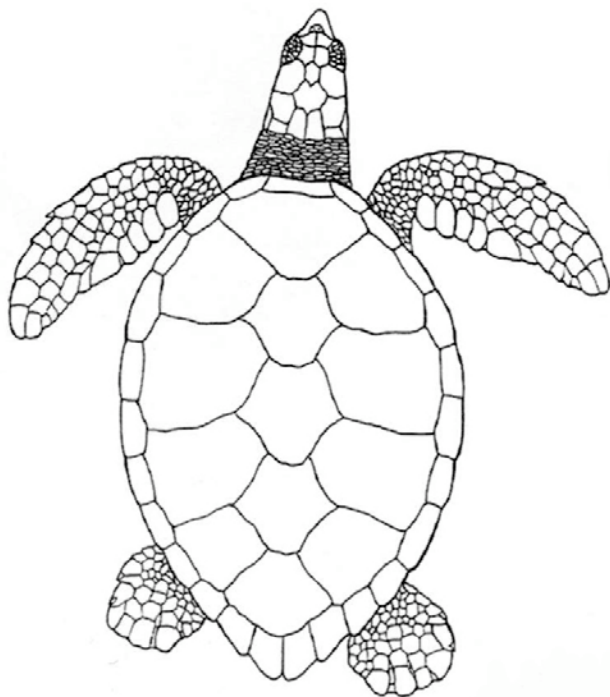
Date of capture:	Method of capture:
Who captured the turtle?	Habitat type where turtle was captured:
Location where turtle was captured (include coordinates if known)	Fate of turtle (if harvested for consumption, include details of final destination)

Write any extra notes on reverse side

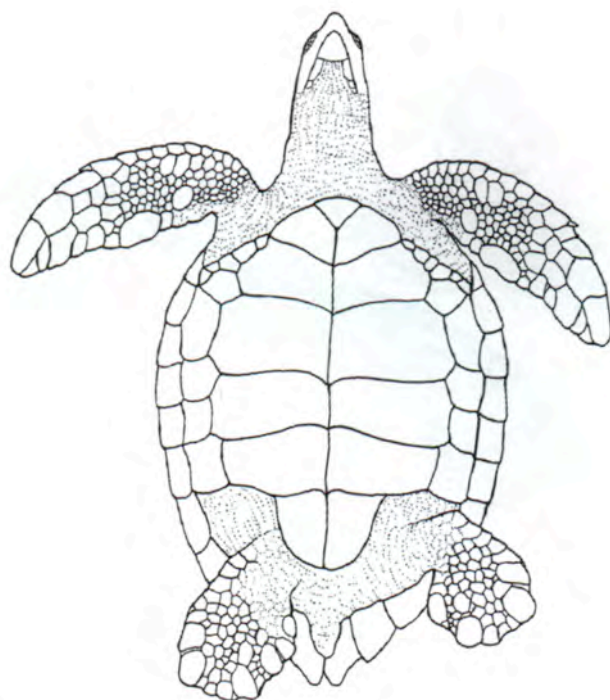
Please indicate genetic sample site on turtle diagram as well as sites of tags/ evidence of disease or damage/ presence of epibionts and record other relevant notes.



Dorsal view



Ventral view



Diagrams from Eckert, K. L., K. A. Bjorndal, F. A. Abreu-Grobois & M. Donnelly (Editors) 1999. *Research and Management Techniques for the Conservation of Sea Turtles*. IUCN/SSC Marine Turtle Specialist Group Publication No.4.

NOTES FROM THE REGIONAL TRAINING WORKSHOP: MARINE TURTLE RESEARCH AND MONITORING

27th August – 2nd September 2002, Grand Cayman



An Initiative of Turtles in the Caribbean Overseas Territories (TCOT), a project funded by the Department for Environment, Food & Rural Affairs (Defra) and the Foreign and Commonwealth Office Environment Fund for the Overseas Territories

Hosted by the Cayman Islands Department of Environment and the Cayman Turtle Farm.

PARTICIPANTS

Name	Affiliation/Country
Amber Thomas	Department of Environment & Coastal Resources, Turks & Caicos
Arlington Pickering	Department of Conservation and Fisheries, British Virgin Islands
Brendan Godley	University of Wales, Swansea, UK (TCOT Project Co-ordinator)
Catherine Bell	Cayman Islands Department of Environment
Gina Ebanks-Petrie	Cayman Islands Department of Environment
James Gumbs	Department of Fisheries & Marine Resources, Anguilla
Janice Blumenthal	Cayman Islands Department of Environment
Jasmine Parker	Department of Environment & Coastal Resources, Turks & Caicos
Jennifer Gray	Bermuda Turtle Project
Joe Parsons	Cayman Turtle Farm
John Bothwell	Cayman Islands Department of Environment
John Jeffers	Government of Montserrat
Jon Clamp	Cayman Islands Department of Environment
Joni Solomon	Cayman Islands Department of Environment
Jose Bodden	Cayman Turtle Farm
Karen Eckert	Wider Caribbean Sea Turtle Conservation Network (WIDECAST)
Ken Hydes	Cayman Turtle Farm
Lisa Campbell	University of Western Ontario, Canada (TCOT Team)
Matt Cottam	Cayman Islands National Trust
Mervin Hastings	Department of Conservation and Fisheries, British Virgin Islands
Michael Finelli	Cayman Turtle Farm
Nell Beaumont	Volunteer – Cayman Islands Department of Environment
Peter Richardson	Marine Conservation Society, UK (TCOT Team)
Sue Ranger	Marine Conservation Society, UK (TCOT Team)
Timothy Austin	Cayman Islands Department of Environment



Bruce Dinwiddy, Governor of the Cayman Islands, pictured here with (from right) Dr Brendan Godley, TCOT Project Coordinator, Gina Ebanks-Petrie, Director of the Cayman Islands Department of Environment, and Peter Richardson, Marine Conservation Society (far left).

SCHEDULE

Wednesday 28 th August	Opening – <i>Bruce Dinwiddy, Governor of the Cayman Islands</i> Introduction to Turtles in the Caribbean Overseas Territories – <i>Peter Richardson</i> Country reports • <i>Cayman Islands – Catherine Bell</i> • <i>Anguilla – James Gumbs</i> • <i>Bermuda – Jennifer Gray</i> • <i>British Virgin islands – Mervin Hastings</i> • <i>Cayman Turtle Farm – Ken Hydes</i> • <i>Montserrat – John Jeffers</i> • <i>Turks & Caicos Islands – Amber Thomas & Jasmine Parker</i> Turtle biology and research protocols – <i>Dr Brendan Godley with contributions from Jennifer Gray, Catherine Bell & Janice Blumenthal</i> Introduction to Socio-economic component of TCOT and draft questionnaires – <i>Dr Lisa Campbell</i>
Thursday 29 th August 2002	Early morning rookery visit (6.00am) with nest excavation– <i>Catherine Bell & Joni Solomon CIDoE</i> Socio-economic questionnaire planning/group discussion – <i>Dr Lisa Campbell & Sue Ranger</i> Revision of questionnaire – <i>Dr Lisa Campbell & Sue Ranger</i> Questionnaire field testing – <i>All participants</i> Public talks organised by CIDoE and hosted by the Holiday Inn. Presentations by Joni Solomon (CIDoE), Dr Brendan Godley and Peter Richardson
Friday 30 th August	Questionnaire discussion of field testing and finalisation – <i>Dr Lisa Campbell</i> WIDECAST tagging programme – <i>Dr Karen Eckert</i> Tour of Cayman Turtle Farm – <i>Joe Parsons</i> Practical session: handling, tagging, genetic sampling protocols – <i>Staff of CTF, CIDoE & TCOT</i>
Saturday 31 st August	In-water sampling: search and capture techniques, practice protocols learnt on day 4 – <i>CIDoE</i> Review of foraging site transect methodology – <i>Dr Brendan Godley & Peter Richardson</i>
Sunday 1 st September	Further discussion and revision of questionnaire – <i>Dr Lisa Campbell & Sue Ranger</i> TCOT Tourism leaflet & Diver Survey – <i>Sue Ranger</i> Fundraising – <i>Peter Richardson</i> Turtles in Japan and Costa Rica- <i>Nel Beaumont</i> Workshop close – <i>Dr Brendan Godley</i>

NOTES FROM THE REGIONAL TRAINING WORKSHOP: MARINE TURTLE RESEARCH AND MONITORING

1 WORKSHOP COMPONENTS

1.1 Presentations *(All participants)*

Copies of the presentations made during the workshop are included on the TCOT workshop participants CD (Annex 1), distributed to all participants. The aim of these notes is to record additional activities and key points from discussion.

1.2 Early morning rookery visit and nest excavation *(CIDoE)*

Delegates accompanied CIDoE staff on their routine morning rookery visits and assisted with the excavation of emerged nests. Delegates were shown how to locate and excavate contents from a hatched nest. They then assisted CIDoE staff in retrieving and recording shells from successfully hatched eggs, un-hatched eggs, including those that showed no sign of development and those that had stopped developing at various stages, dead hatchlings and live hatchlings that had not emerged with the rest of the clutch. Delegates were also shown how to take tissue samples for genetic analysis.

Collecting this information in the OT's will, over time, increase knowledge of clutch sizes and hatching success as well as providing samples to genetically profile the nesting turtle population.

1.3 Questionnaire field testing *(All participants)*

Following an exhaustive introduction to the socio-economic questionnaire and the opportunity to trial sections on fellow delegates, the CIDoE arranged for everyone to have the opportunity to put their interview techniques into practice with fishermen, restaurant owners, dive operators and members of the public. The experience brought home to everyone involved in TCOT what is involved in conducting a comprehensive survey of this kind and proved invaluable in highlighting areas of the questionnaire that needed to be reworked, removed or added.

Delegates were able to identify and discuss the challenges that lie ahead in administering the survey. Among their concerns was the fact that many of them are enforcement officers and they acknowledged that conducting this survey might prove difficult as they are, in some cases, asking individuals to reveal details about activities that contravene existing legislation.

With lively discussion and enthusiastic input from all delegates the questionnaire underwent significant changes during the workshop. It was originally planned that the questionnaire would be finalised at the workshop, but as all delegates wanted the opportunity to comment on the final version, it was decided that all changes would be made and the questionnaire would be circulated

to all delegates for comment following the workshop. It will then be finalised and will be administered in the OT's in 2003.

1.4 Cayman Turtle Farm: handling, tagging, genetic sampling protocols (CTF, CDoE and TCOT staff)

The delegates were made very welcome at the CTF and enjoyed an informative guided tour of the facilities. Though some delegates have been involved in marine turtle research and conservation for some time, others had never tagged a turtle or taken a genetic sample. At the Farm, delegates had the unique opportunity of receiving hands-on training in inserting PIT tags and flipper tags in some of CTF's future green turtle (*Chelonia mydas*) breeding stock. In addition they were shown how to take genetic samples from large turtles and practised taking standard carapace measurements.

1.5 In-water sampling: search and capture techniques (CDoE)

The CDoE arranged for delegates to spend a morning participating in their established in-water sampling project. All delegates had the opportunity of searching for turtles using the "man-on-tow" method and capturing them while free diving. Captured turtles were brought to a research boat where CDoE staff demonstrated standard biometric data collection, tagging, tissue and blood sampling. Delegates and CDoE staff had a successful day and 4 foraging juvenile hawksbill turtles (*Eretmochelys imbricata*) were captured and sampled.

1.6 TCOT tourism leaflet & Caribbean Turtlewatch diver survey (Sue Ranger)

In addition to the socio-economic questionnaire, two self-selective surveys have been designed to fulfil a suite of functions. The TCOT tourism leaflet was developed with input from all OT partners and aims to engage the general public. The reply slip included in the leaflet not only allows interested individuals to report on their turtle encounters in that OT, but also encourages them to support conservation work by supporting the local organisation involved. The other initiative, Caribbean TURTLEWATCH, arose from an interest expressed by dive operators in the OT's. The scheme allows recreational dive operators to keep records of their dives and record whether or not they see turtles, which species they see and where they see them. As dive operators regularly visit the same dive sites, this will allow for consistent recording of the presence or absence of turtles at certain sites as well as elucidating trends in abundance over time.

2 KEY ISSUES RAISED IN DISCUSSION

2.1 Legislation, penalties and enforcement

- Some delegates were keen to know which legislation, penalties and levels of enforcement are in place in the various OT's.
- Though there is legislation regarding marine turtles in place in all 6 OT's and, in some instances, significant penalties exist; delegates expressed scepticism about the efficacy of

existing measures. For example, cases were reported where individuals had been found in breach of legislation designed to protect marine turtles, but no action had been taken against them.

- Delegates also identified inappropriate legislation, for example minimum size limits which protect juvenile turtles, but allow the harvest of breeding adults. It was reported that fishermen are unlikely to take small turtles in any event, and are more likely to target larger animals that yield more meat.
- Challenges to effective enforcement of legislation, like size limits, species restrictions or closed seasons, were identified by delegates included the difficulty of achieving effective coverage of vast territorial waters with limited budgets, equipment and staff.
- It was reported by some delegates that the turtle fishery was experiencing a decline as few young fishermen were taking it up. Enforcement authorities in some OT's felt that legislation banning harvest is inappropriate at this time as the fishery is likely to disappear naturally. It was, however made clear that there is still an active fishery in some OT's, where a proactive approach to changing practices may be necessary.
- Some delegates felt that there was pressure from the UK to terminate the utilisation of turtles in the OT's. The TCOT team pointed out that this project was not instigated with any particular outcome in mind, but that the aim was to assess the particular situation in each OT and make recommendations based on findings over 3 years.
- As alternatives to legislation and enforcement, some success was reported in working towards engaging turtle fishers in research and conservation work. It was felt that this might be a more effective way of changing practices than legislating against the use of turtles. In addition to a decline in demand it was also reported that turtle meat is disappearing off the menu in some places as a result of opposition from the tourists and the tourist industry, which is the mainstay of most OT economies.

There are currently significant reviews of legislation underway in some of the OT's and delegates identified the shortcomings of existing legislation. It was felt that this would be an opportune time to look towards harmonisation of legislation relating to marine turtles throughout the UK OT's. Dr Karen Eckert of WIDECASST agreed to circulate a document containing details of support for harmonised legislation including recommendations from OECS, SPAW and the Regional Sea Turtle meeting held in the Dominican Republic. In addition this document will include draft recommendations for harmonised legislation proposed by WIDECASST.

2.2 Constraints to carrying out marine turtle monitoring and research

- Delegates identified a lack of resources and time as a major constraint to carrying out consistent monitoring.

- Vast territorial waters and accessibility of nesting and foraging habitat on uninhabited or remote cays were identified as constraints to consistent monitoring.
- For all delegates, marine turtles represent only one component of their work and do not always take priority.
- It was suggested that one way to overcome this obstacle is to limit efforts to certain times of year and carry out intensive monitoring which can be replicated from one season to the next

The TCOT team reminded delegates that part of their remit is to assist OT partners in securing funding and acquiring skills to ensure that baseline research and monitoring can get underway and continue. It was recommended that delegates identify vital skills or resources that they are lacking so that progress can be made towards meeting their needs. As an outcome of this workshop, delegates will be provided with details of potential sources of funding.

2.3 Capacity building initiatives

- Delegates recognised the value of being able to attend this workshop and gain hands on experience of research and monitoring techniques.
- Those delegates who were fortunate enough to receive support to attend the Bermuda Turtle Project in-water training workshop in 2002 stressed the benefits of this extended period of exposure to field research.
- It was reported that researchers at a well-established nesting beach monitoring site in Antigua had already expressed willingness to host and train representatives from the UKOT's. Karen Eckert of WIDECASST indicated that her organisation would fully support this kind of skills transfer.
- Delegates indicated that it would be highly beneficial to their ongoing research and monitoring efforts to ensure that individuals within each OT were equipped with the skills necessary to conduct effective, standardised research.

It was agreed that efforts be made to try and ensure that representatives from all OT's be given the opportunity to attend the Bermuda Turtle Project in-water sampling training course.

2.4 Ownership of information

- Delegates agreed that ownership of all data gathered during the TCOT project should be overtly established. Delegates expressed concerns about previous experience of foreign researchers conducting research and not passing information on to the relevant OT government

The TCOT team will draw up a document overtly establishing ownership of information, which will be circulated to all OT partners for comment.

2.5 Reporting and networking

Delegates recognised the benefits of meeting and establishing a loose network of colleagues in the region. Following from this they expressed a desire to meet again at the end of the TCOT project to report on progress, identify outstanding issues that need to be addressed and plan for the future.

With this in mind, it was felt that the TCOT Team should work towards securing funding to hold a closing meeting for TCOT partners in 2004/05. Delegates also felt that representatives from UK OT's should be offered support to attend the annual International Sea Turtle Symposium to present findings of their work, but also to network with the international marine turtle community.

3 TCOT WORKSHOP CDs

As an output of this workshop, TCOT has produced 2 resource CDs for the participants in order to aid their TCOT research and conservation work. The contents of these CDs are outlined in Annex 1, and include the presentations from the workshop, monitoring protocols, datasheets, scientific papers, downloads from the NOAA Electronic Reading Room as well as a small photograph library.

These photographs may be used for audio-visual purposes only and may not be used for publication without prior permission from the photographers. If you would like to use these pictures for publication, please contact TCOT.

ACKNOWLEDGEMENTS

TCOT would like to thank the Department of Environment Food and Rural Affairs, the Foreign and Commonwealth Office and Cheltenham & Gloucester plc for their support of this project. TCOT would also like to thank the Cayman Island Department of Environment, the Cayman Turtle Farm, the University of Western Ontario and WIDECASST for their valuable input and support of this workshop.

Annex 1

TCOT REGIONAL TRAINING WORKSHOP CD

Compiled by TCOT, with assistance from WIDECAST and the Cayman Island Department of Environment

CONTENTS

TCOT Workshop CD

1 GENERAL

Contents

TCOT Workshop briefing document

TCOT Workshop Proceedings Notes (incl. contact details of all participants)

TCOT Participants contact list

DEFRA TCOT leaflet for CITES CoP12

WIDECAST recommendations for a regulatory framework for marine turtle management.

2 TCOT PARTNER COUNTRY REPORTS

Microsoft PowerPoint presentations given at the TCOT workshop by Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and Turks and Caicos Islands.

3 TCOT INTRODUCTION, METHODOLOGY AND CONSERVATION ISSUES

Microsoft PowerPoint presentations given at the TCOT workshop including:

Bermuda Turtle Project Net Sampling Methodology

Cayman Genetic Analysis Overview

Cayman In-water Hand Capture Methodology

Introduction to Socio-Economic Assessment

Introduction to TCOT

Marine Turtle Biology and TCOT Methodology

Questionnaire Explanation

Sea Turtle Project Data Management

Sea Turtles and Light Pollution

Turtle Conservation in Japan

Why Tag a Sea Turtle

4 FUNDRAISING

Guidance notes, application forms and contact details for over 20 sources of funding relevant to marine turtle conservation and research in the Overseas Territories including:

BP Conservation

British Airways

British Chelonia Group

Chelonia Research Foundation

Conservation, Food and Health Foundation

Darwin Initiative

Department of Food and Rural Affairs/ Flora & Fauna International

Foreign and Commonwealth Office

Global Greengrants Fund

MCS Turtle Conservation Fund

National Wildlife Federation

National Fish and Wildlife Service

PADI

People's Trust For Endangered Species

Other sources of funding

5 PHOTOGRAPHS

Over 200 photographs, mostly from the MCS marine turtle photo library along with contributions from the CIDoE, arranged into categories including:

Conservation, Research and Awareness
Harvest
TCOT Workshop
Threats
Tiger Shark
Turtle Pictures

These photographs are not to be used for publication without prior permission from the photographers. If you would like to use these photographs for publication, please contact TCOT.

6 EXAMPLES OF PRESS COVERAGE

Press releases, newspaper and internet articles about the TCOT Workshop

7 TCOT BIBLIOGRAPHY, MTRG SCIENTIFIC PAPERS AND OTHER TECHNICAL REPORTS

The TCOT Bibliography, a www.seaturtle.org ID key, as well as 35 .pdf format papers from the Marine Turtle Research Group, University of Wales Swansea, arranged into categories including:

Diving Behaviour
Hatchling Development
Nesting
Pollution
Research Methods
Satellite Telemetry
Status Estimates

8 TCOT MONITORING PROTOCOLS AND SAMPLE DATASHEETS

The TCOT research protocols as well as 6 different sample datasheets from TCOT, the CIDoE and the Bermuda Turtle Project.

9 CARIBBEAN TURTLEWATCH

The publicity poster, instructions for dive operators and datasheets in .pdf format and Access database for entry of dive data.

NOAA 'Electronic Reading Room' Downloads CD

RECOVERY PLANS: NOAA US Atlantic Recovery Plans and US Pacific Recovery Plans for six species of marine turtle.

SYMPOSIA: 14 separate and full .pdf format copies of Proceedings from all sea turtle symposia from the 8th Annual Workshop on Sea Turtle Conservation and Biology (1988) to the 20th Annual Symposium on Sea Turtle Biology and Conservation (2000) inclusive.

TURTLES: 5 additional marine turtle papers and proceedings from the NOAA Electronic Reading Room, dealing with issues such as the Cuban hawksbill harvest, Long-lining, TED's and status assessments.

Annex 2

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TCOT Advice Note 2:

Monitoring of Marine Turtle Populations in Foraging Grounds

NB TCOT advice notes will be updated periodically. Please contact us if you have any comments/queries or you would like to receive the most up-to-date version:

<info@tcot.seaturtle.org>

Nesting beach monitoring is important but data generated may not be a very sensitive index of the health of the whole population as they only give an index of the numbers of one sex (female) and one life stage (adult). To really find out how turtle populations are doing we need to get into and above the water. We can then start to determine their relative abundance and gain insights into population trends when they are in the foraging grounds. After all, this is where they spend the vast majority of their lives and often when they are most under threat. One of the TCOT aims is to have a minimum of two index foraging sites subject to regular monitoring in each OT by the end of the project.

A tremendously good review of relevant methodologies and their relative strengths and weaknesses has been produced in a multi-author publication edited by Bjorndal and Bolten (2000). **Anyone who does not have a copy of this key publication should contact the TCOT team and we will endeavour to make sure a copy reaches you.**

Three main groups of methodologies are outlined in this publication:

A. *NON-TRANSECT METHODS* that generate “Catch Per Unit Effort (CPUE)” Statistics:

- Netting techniques
- Standard swim snorkelling techniques
- Standard boat-based searching
- Bycatch recording techniques

B. *TRANSECT-BASED METHODS* that generate “Catch Per Unit Effort (CPUE)” Statistics

- Aerial surveying techniques
- Boat-based surveying techniques

C. *CAPTURE-MARK-RECAPTURE METHODS*

For definitions of all these terms you are referred to Bjorndal and Bolten (2000).

NB: Transect Methods: Transect methodologies are unlikely to be of wide utility within TCOT. They assume that one can monitor a narrow strip of a habitat and extrapolate to generate wider estimates. Most of the habitats we are dealing with are created of many small patches of different substrata types and variable depths.

NB: Capture-Mark-Recapture Studies: The generation of estimates by these methods are not possible during the time-span of TCOT. Through tagging initiatives supported by WIDECASST flipper tags and TCOT PIT tags, the foundation will be set for long-term mark and recapture studies. There is a wide range of issues regarding tag types, tagging locations and databases which were touched upon during the TCOT workshop. These will be explored more fully within the WIDECASST tagging programme, which is open to all TCOT project partners.

The habitats that TCOT partners in the Caribbean are working within are usually not expansive or homogeneous and the human and material resources for such work are limited. Thus, in choosing methods to assess the relative abundance in our foraging grounds, we must be cautious and choose the correct methodology that will give worthy results within the many methodological and logistical constraints that exist (e.g. availability of personnel, availability of equipment and the suitability of each method to the habitat in question). TCOT staff will discuss the various methodologies available and help project partners decide on a methodology that is best suited on a case by case basis. This note is designed to be the first step in contribution to this process.

Before exploring specific methods that could be used as part of TCOT it is worth exploring a few cautionary notes:

Caution: Over-interpretation

Although rigorously collected data can give an index of abundance at a given site we must always be careful not to over-interpret these data and put too much stock in comparisons with other sites in the same OT or similar sites in other countries. What we can aspire to is to gather our data at one site in a manner that can be replicated in subsequent years allowing comparisons in the “relative abundance” at the same site to be made over time.

Caution: Choice of study site

We must not only choose areas with high density of turtles as our study sites. What if these are already full to carrying capacity? If the wider population increased the change might not be detected at these sites. Additionally, if population decreased, a decline may not be detected if these sites were re-colonised by individuals from less suitable areas. It may be ideal to tie in with concurrent monitoring programmes and use the same sites in turtle monitoring as used in pre-existing efforts such as seagrass and/or coral reef monitoring. It is unlikely that surveying can be carried out at the same time for both turtles and coral/seagrasses but at least any changes in habitat quality can be linked with changes in turtle numbers.

Caution: Setting achievable goals

Given personnel and resource constraints, we should not be choosing index sites that are logistically difficult to monitor. It is likely that monitoring of these sites will be accomplished so intermittently that meaningful data sets cannot be gathered. It is impossible to give an a priori definition of how often to survey a site. In general, the more often the better. If data are highly variable in the short term then it means that it will take longer to detect any trends in relative abundance. Variability may be lowered by increasing the survey effort i.e. net soak time, length of transects or by combining several separate sites which are likely to be linked e.g. sections of the same reef or seagrass complex. Once the TCOT surveys are up and running it will be possible to look at data and evaluate the likely “statistical power” of the methods, allowing methodologies to be refined for best long-term benefits.

Caution: Choosing timing of surveys

Timing: When in the year should we do our surveys?

Superimposed on the availability of personnel and resources, there are likely to be seasonal patterns in abundance of turtles, (e.g. more near a nesting beach in the breeding season, certain foraging areas being preferred at certain times of the year)

and seasonal patterns in detectability (resulting from e.g. sea state, underwater visibility). These factors need to be borne in mind. It is suggested that a concerted effort be made at the same time annually. The timing of this will depend on logistics and sea state etc. Where possible, useful insights will be gained from, at least in the first few years, carrying out additional limited surveying throughout the year.

Timing: When in the day should we do our surveys?

Sea turtles have been shown to have marked patterns in behaviour and there may be greatly varying patterns of detectability at different times of day/tidal states. It is recommended that in initial stages of survey work, intensive studies are undertaken to find out if there are patterns that need to be taken into consideration whether they be tide state or time of day. Input from local fisherman may be invaluable in that regard. Obviously the time of day/state of tide when individuals are detected is the preferable time to be designated as the target study period. Once these conditions are set, wherever possible surveys should be carried out at similar times of day/tidal state. Where tidal differences are small, it may be more practicable to select a standard time of day. The angle of reflection on the sea surface can obscure visibility in otherwise-clear waters from above. It is recommended that aerial and boat surveys take place as close to midday as possible, when the angle of incidence of rays from the sun is nearly perpendicular to the sea surface. The exact time and tidal state should be recorded for each survey.

Timing: What about the weather?

The proportion of cloud cover/sea state/in water visibility are all factors that are likely to have considerable effect on the detectability of turtles by most methods. At minimum, these conditions should be recorded as part of the routine data collection. This can allow the assessment of bias in the future.

METHODS: RECORD THEM FOR OTHERS

Before we elaborate specific methodologies, it is worthy of noting the extreme importance of recording methodologies in detail. Biological monitoring is a field in which there is often a high turnover of staff. To ensure your efforts achieve maximum possible legacy, it is important to record your overall methodologies in great detail (location, timings, effort) and store these in central files back at your office. All these data should be recorded for each survey at each site. A useful exercise would be to draft a within-house monitoring protocol. Assistance can be given during TCOT field visits or by e-mail.

RESULTS: RECORD THEM WITH CLARITY

Regardless of the methodology used it is important to clearly record data to make sure efforts are best spent. Undoubtedly, the design of a datasheet for each monitoring site will be useful. The data being recorded will be different for different methods. On the TCOT Workshop CD we include the form used by the Bermuda Turtle Project and the one used by Cayman Islands Department of Environment. It is important to record all the data for turtles observed/captured as well as environmental and methodological data. TCOT staff will help design customised forms with partners during field visits if needed.

WHAT METHODS FOR TCOT?

The methods that are most likely of use for TCOT are those in group A that generate CPUE data.

Method 1: Snorkelling observations generating CPUE data

EXAMPLE 1 - along the face of a reef, along the edge of a seagrass bed, across coral gardens or possibly even across seagrass beds in deeper water. The snorkeller then records number of turtles, species and size. Attributes of this methodology that must be kept constant are:

- The number of observers on a swim
- The route, direction and speed of a swim
- The time of day/tidal state

The power of this technique is that it is cheap and means many replicates of the survey can be carried out throughout the year. An important note should be made that swimming for assessment of abundance should be kept separate from efforts to capture turtles for genetic sampling i.e. this can be at the same site but not on the same days. This will allow observers to keep as many factors as possible constant.

EXAMPLE 2 - The TCOT diver participation initiative, *Caribbean Turtlewatch* aims to use a modified version of this technique to obtain indices of abundance at dive sites around the OT's.

Method 2: Boat-based observations generating CPUE data

EXAMPLE 1 - across the middle of a seagrass bed or through a set of inshore lagoonal habitats. The observer(s), preferably not the skipper, record number of turtles and where possible species and size. Attributes of this methodology that must be kept as constant as possible are:

- The type of boat/engine
- The number of observer (s)
- The position of observer (s)
- The route, direction and speed
- Time of day

EXAMPLE 2 - A modification of the swimming method involves towing swimmers behind a boat on a rope to allow them to observe turtles across large swathes of habitat. This can be modified into a transect based methodology if careful logging of distance all turtles are observed from the transect line is recorded.

Method 3: Netting generating CPUE data

EXAMPLE 1 - Floating turtle nets or large turtle seine. There are a number of advantages of these methods as turtles are captured, can be measured and sampled for genetics. This method gives also a very good opportunity of involving turtle fishermen in the TCOT process. Factors to be kept constant where possible:

- Location of set and depth of water
- Timing and tidal state of set
- Length, depth and type of net used
- Soak time
- Sea state/underwater visibility

Obviously, not all of these factors can be kept constant at all times but they should, at minimum, be recorded.

Method 4: Fishery CPUE statistics

Useful ideas regarding the abundance of turtles can be obtained from fishing records and from accounts of fishermen themselves regarding captures have been accidental or directed. The TCOT socio-economic questionnaire-based survey will allow insights in this regard.

References

Bjorndal KA & Bolten, AB (Editors) 2000. Proceedings of A Workshop on Assessing Abundance and Trends for In-Water Sea Turtle Populations. U.S. Dep. Commer. NOAA Tech. Memo. NMFS-SEFSC-445, 83pp. Available on-line as A Pdf From: <http://www.sefsc.noaa.gov/PDFdocs/Pop_Assess_Workshop_report.pdf>

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TCOT Advice Note 1:

Monitoring of Marine Turtle Nesting Populations

NB TCOT advice notes will be updated periodically. Please contact us if you have any comments/queries or you would like to receive the most up-to-date version:

<info@tcot.seaturtle.org>

Nesting beach monitoring is one of the important components of an integrated approach to assessing marine turtle population status. One of the TCOT aims is to have at least two index nesting sites subject to comprehensive monitoring in each OT by the end of the project. It should be noted that as an outcome of recent Caribbean Range State Dialogue Meetings, discussions have been undertaken towards the development of monitoring protocols for index nesting beaches for hawksbill turtles in the wider Caribbean. Where possible, we seek to harmonise our advice with the outcomes of this process

Many useful reviews of relevant methodologies are included in Eckert *et al.* (1999). **Anyone who does not have a copy of this key publication should contact the TCOT team and we will endeavour to make sure a copy reaches you.**

Should we monitor by night or day?

Although at first, it might seem that the ideal plan for nesting beach monitoring would be to patrol the beach by night in an attempt to observe each turtle, one should think very carefully before embarking on such work, weighing up the relative advantages and disadvantages:

Advantages:

- 1) Confirms species identification
- 2) Allows identification of individual females and estimation of parameters such as:
 - Clutch frequency
 - Remigration intervals
 - Inter-nesting intervals
 - Nest-site fidelity
- 3) Allows sampling for:
 - Genetics
 - Epibionts
 - Morphometrics
- 4) Allows accurate marking of nests
- 5) Allows for a definitive assessment of whether a clutch has actually been laid.
- 6) Allows prompt nest relocation in the cool of the night.
- 7) May reduce predation/poaching threats & identify light problems.
- 8) Can be important in raising public awareness and funds.

Disadvantages:

- 1) It is very time and labour intensive.
- 2) It involved work during unsociable hours.

Although these are the only real disadvantages, they are major ones! Nesting seasons can last for many months. To carry out rigorous night-time monitoring one really needs to be out all night, every night and if beaches are long and/or turtles are few, motivation is quickly lost by even the keenest staff and volunteers. In addition, most experienced turtle researchers will tell you that daytime surveys will still be needed to ensure that all data were collected and collated. Thus, daytime surveys are

the keystone of all nesting beach monitoring operations. However, should you carry out night-time surveys, it is important to structure your data collection for best effect. We include a specimen Night-Time Nesting Data Sheet on the TCOT workshop CD that you are free to modify and use. TCOT personnel can run through using these datasheets during subsequent field visits.

For the purposes of TCOT, the status of nesting populations should be assessed using daytime surveys, at least in the first few seasons. This allows us to take advantage of the main benefits of daytime monitoring, i.e. there is much less work involved than in night-time monitoring, the work can be undertaken more intermittently and large stretches of beach can be comprehensively surveyed by a few personnel. Nocturnal monitoring of key, high density nesting beaches can be carried out in future, should resources be available. There are, however, great benefits to be gained from occasional night patrols **in addition** to a daytime assessment of nest numbers. Occasional night patrols, preferably at the peak of the nesting season on the beaches with the highest density of nesting will help provide workers/volunteers with enthusiasm and knowledge of the nesting process which improves track identification/interpretation capabilities.

This advice note includes an overview of daytime monitoring and a basic assessment of nest success. Given that many of the nesting turtle populations in the UK Overseas Territories in the Caribbean are likely to be small, (relative, for example, to the nesting populations in Costa Rica or Mexico), it is extremely useful to assess the success of at least a portion of nests to ensure fertility and evaluate hatching success. Additional benefits include obtaining genetics samples as well as confirming species ID.

Monitoring By Daytime Surveys

The underlying basis of daytime monitoring is that turtles leave tracks in the sand when they emerge to nest. These tracks can help us assess the species and whether or not egg-laying occurred. The basic principles of species and track identification are detailed in the Powerpoint presentation '*Marine Turtle Biology and TCOT Methodology*' on the TCOT workshop CD and in the Florida Fish and Wildlife Conservation Commission (FFWCC) video, "*A Beachcomber's Guide to Turtle Tracks*" (provided at the TCOT workshop with permission from FFWCC).

It is vitally important to record data clearly, even during surveys when no nesting activity is recorded. We recommend that field data is recorded on at least two forms of backup datasheets/databooks. Many useful data have been lost over the years as a result of poor backup protocols. We include a specimen Daytime Nesting Data Sheet on the TCOT workshop CD that you are free to modify and use. Additional models are included in Schroeder and Murphy (1999). TCOT personnel can run through customising/using these datasheets during subsequent field visits.

Why undertake daytime monitoring?

The basic information which can be gathered includes: which species are nesting, how many nesting activities there are, the proportion of activities which result in egg laying, nest location, nesting season, nesting success and threats. Threats include categories such as nest depredation, inundation, adult female harvest. All of these allow the assessment of the nesting population status and help define priority areas and times for monitoring and protection.

How do I set up my monitoring operation?

There are a number of key criteria that need be considered. These include:

- **Method of transport**
- **Geographical scope of monitoring operation**
- **Location and accessibility of monitored beaches**
- **Frequency of survey**
- **When in the year to survey**
- **Timing of survey on monitoring days**
- **What to record**

We look at each of these in turn and provide additional tips from experience that will help you set up monitoring efforts that yield data of the best possible quality.

Method of transport

Daytime surveys can be conducted by aerial, vehicle based and foot survey. Aerial surveys are expensive, need ground truthing and in small island situations, as experienced by many TCOT partners, probably only have utility in the location of previously undocumented nesting areas e.g. on remote cays. Obviously, land vehicles or boats will be needed to move between monitoring areas and field teams usually evolve efficient methods of making best use of vehicles with multiple drop-off and pick up points. In some parts of the world the actual survey effort is undertaken on vehicles e.g. motor bike, quad bike, 4 wheel drive vehicle. This necessitates capital investment and can lead to prohibitively high maintenance costs. In addition, the environmental impacts of using vehicles on nesting beaches should be considered (e.g. beach impaction, dune degradation and encouragement of others to use vehicles on the beach by example). It is hard to imagine that vehicle-based surveys will be of great utility within TCOT as most beaches are relatively short. Surveying on foot may be hard work but it is the most reliable and is likely to be method of choice in most cases.

Geographical scope of monitoring operation

Various levels of monitoring may be appropriate for TCOT data collection. Any of the following strategies, or some combination, may be used:

- 1) Monitor all the beaches throughout the coastline
- 2) Monitor the main nesting beaches only
- 3) Monitor a few selected key index sites

It is unlikely that all nesting beaches in each OT will be surveyed for TCOT. We are confident that enough is known about turtle nesting in each OT to allow the identification of several index sites, that can be monitored from 2003 onwards so that all nesting is recorded on those sites. However, it may be that other important sites and/or diffuse nesting are found elsewhere, that can be included in further, less intensive surveys. Such surveys will highlight other areas of conservation concern and may highlight other suitable index sites. It should be noted that an index site can be made up of several smaller coves or cays in the same location.

Location and accessibility of monitored beaches

Accessibility is an important component to be considered in any monitoring effort. It may be that very remote beaches, although very good for nesting are monitored less intensively. However, one over-riding principle is important regardless of the monitoring regime undertake. It is vitally important to meticulously detail the boundaries of all study sites so that fair comparisons are possible with data collected in the future. As well as defining the boundaries of the index site, careful mapping of the site and the nest locations will yield important management data. GPS has utility in this

regard but orientation to immovable markers is more valuable as it facilitates the relocation of nests at a later date (e.g. for excavation after emergence to assess nest success). On beaches with few permanent markers, manmade markers e.g. PVC pipe can be driven into the sand at regular intervals.

Frequency of surveys

Ultimately the more often the better, but monitoring can be undertaken according to either of three main strategies:

- 1) **Daily monitoring** results in less confusion, error and records all activities but is relatively expensive in time and effort.
- 2) **Monitoring every 2-3 days** records most if not all activities, but erosion of tracks due to weather and beach use may lead to some confusion. This is most suitable for low density nesting sites and is economical with respect to human and vehicular resources.
- 3) **Regular and sporadic monitoring** of major nesting beaches (e.g. every 7-21 days) for two consecutive days in each survey bout. This will allow recording of all nesting activities that occur during the two-day period. Although only a small proportion of activities is actually recorded, the pronounced seasonal distribution of nesting allows missing data to be interpolated. This is the technique used at high-density nesting beaches (e.g. Ascension Island in Godley *et al.* 2001) and is very economical with respect to manpower resources. It is, however, unlikely to be of great utility within TCOT for index nesting sites. One role for this survey technique would be in the assessment of the relative importance of the nesting levels and seasonality at inaccessible sites proposed as for more detailed work in the future (e.g. a remote cay known for high levels of nesting activity).

Your choice is very dependent on the density of nesting and the duration of the nesting season and the resources available to you. For the purposes of TCOT, we anticipate that monitoring frequencies of between every 1-3 days will provide the optimum efficiency and coverage.

When in the year to survey

It is important, wherever possible to ensure that your survey efforts encompass the whole nesting season and to remember that each Territory hosts nesting populations of different species that have different nesting seasons. In the initial 2 years of beach monitoring we would suggest the following:

Index beaches

- 6 weeks prior to expected commencement of the nesting season, index beaches should be monitored **once per week**.
- Commencing on the date of the first recorded nesting activity of the season on the index nesting beaches (or through opportunistic reports from other beaches), **full scale monitoring** begins. Survey effort is kept constant until 7-10 days have elapsed of no activity.
- After 7-10 days of no activity monitoring continues occasionally about **once per week** for an additional 4 weeks.

Extensive monitoring

- Monitoring begins at the same time as that on index beaches.
- Survey effort kept constant until cessation of main efforts on index beaches.
- Surveying can be less often than that of index nesting sites but when the survey interval exceeds 3 days, the quality of information is likely to decline.

It is advisable to stratify efforts so that the more important areas receive higher effort and areas thought to be of minimal importance are only monitored occasionally to ensure that no important pockets of nesting are being missed. An example of a possible schedule:

- Index nesting sites monitored every 1-2 days
- Beaches of moderate importance are monitored every 2-3 days
- Beaches thought to be of minor importance are monitored every 3-4 days in the first season. These can either be promoted to the status of moderately important beaches or considered of minimal importance and either discarded from the monitoring schedule or subject to occasional monitoring to ensure that they are not being used for nesting.

Timing of surveys on monitoring days

Undoubtedly, the earlier in the day the survey is undertaken the better. Dawn is without doubt the best time to survey. The tracks are fresher at dawn and are clearer, due to the angle of sunlight creating strong shadows that provide more contrast and allow a more accurate assessment of nesting activity and species ID. In addition, the ambient temperature is more comfortable to work in, particularly work which involves walking any distance along beaches.

What to record

The key information being recorded in all daytime surveys is:

For each survey:

- Location
- Date
- Notes on threats

For each track

- Species
- Type of activity (nest, false crawl)
- Position to known markers

Tips to help improve quality of data

Recording data. Before you collect any data, reflect on why you are recording the information and how it will be analysed. Remember, the information you write down on the beach will ultimately be used in analyses and possibly for management decisions. Therefore, be as accurate and clear as possible. If your data sheet has boxes or columns that are to be filled in, remember never to leave any blank. If you did not find anything on your survey or there was no information to report, remember to put a "n/a" in the space. This will help you or someone else in the future interpret the datasheet.

Consistency. One of the objectives of nesting beach surveys is to look for trends in the nesting population. Analyses and interpretation of data from nesting beaches are greatly facilitated by consistent monitoring efforts. It is important to choose your survey protocols carefully and to stick to them, both across the nesting season and across years. Otherwise, it becomes difficult to fully use the data collected

Night work: If you plan to monitor nesting beaches by day it is still important to watch turtles nesting at night in order to understand the nesting process. Regular observation of nesting behaviour will provide the researcher with more accurate interpretation skills when deciphering the tracks and indentations left by the turtle in the sand when undertaking daytime surveys.

Adequate Training: It is important that all personnel receive adequate training and mentorship. It is preferable that all individuals have seen all key species nesting and that a period of working in tandem with an experienced fieldworker is undertaken before data recorders are left to undertake monitoring on their own.

Raking of Tracks: To avoid confusion and double counting it is highly recommended that all tracks are raked over and disguised after recording. A suitable, light-weight rake is an essential element of the monitor's beach surveillance equipment. NB: Researchers in the Cayman Islands rake tracks with the back of the rake because egg collectors (illegal in Cayman) recognise the patterns left by the prongs and use them to locate and excavate a nest!

Clutch finding: Even the most experienced beach monitors cannot tell whether or not a turtle has successfully laid a clutch from tracks in every case. If in doubt, attempts can be made at locating a clutch by clearing away some of the surface sand from the nesting site and probing the sand column for eggs. While this can be accomplished using a stick, inexperienced use can result in the top layer of eggs being punctured. Careful digging with the hands and probing with an extended index finger to feel for soft, recently excavated sand and eggs is less likely to result in egg damage. Unless the eggs are located, it is not possible to say with 100% certainty that a suspected nest contains eggs, especially on beaches with stones or debris in

the sand column. In such cases of uncertainty it is best to err on the side of caution and record the nesting attempt as unsuccessful. This verdict may be reversed if a clutch subsequently hatches or is predated at that site.

Assessing the success of turtle nests

Why monitor the nests?

There are a number of reasons why it is important to monitor and assess the fate of at least a portion of nests (see Miller 1999):

1. To confirm species ID
2. To obtain genetic samples
3. To assess fertility and hatching success
4. To assess the likely level of recruitment from the beach
5. To assess threats such as predation, poaching, inundation etc
6. To identify “good” and “bad” sites
7. To evaluate and amend conservation measures

In some projects the fate of almost every nest is attained by detailed marking of nests with an internal “nest tag”, external markers, and mapping of their locations in relation to visible beach markers, planted at equal distances along the back of the beach. The use of these types of markers may not always be possible for TCOT research as a result of manpower constraints or the potential of signalling nest location to potential poachers. However, some form of nest location should be recorded and existing land marks along the back of the beach, such as rocks, buildings, trees and other sturdy and permanent vegetation can be used to relocate nests, as long as the position of the nest was accurately recorded in relation to these landmarks when it was first recorded. This method can be discussed with TCOT personnel during subsequent field visits.

It is important to record data clearly. We include a specimen Fate of Nests Sheet on the TCOT workshop CD that you are free to modify and use. TCOT personnel can run through customising and using these sheets during field visits.

How to Excavate hatched nests

With a full excavation of nest contents it is possible to estimate the clutch size and hatching success of the nest. See Miller (1999) for details. Where possible nest excavation should be carried out after 48 h has elapsed since the last hatchling emergence or after 70 days of incubation. Always wear gloves and adhere to strict hygiene standards when excavating nests. Decaying turtle tissue is extremely smelly and may contain pathogens harmful to humans. Once you have put on some rubber gloves, dig down directly above the slight depression in the sand from where the hatchling tracks emerge. Take care as there may be live hatchlings in sand column.

Remove any live hatchlings to a bucket for closer examination and species ID. Dead hatchlings and embryos should be kept for genetic sampling. If live hatchlings are found at night then they should be released immediately to facilitate maximum chances of survival. However, if the excavation is carried out during daylight,, the hatchlings should be retained in an escape proof container (e.g. a bucket) containing some moist sand, which should be placed in a cool, dark and secure building until night fall, when they should be released, preferably on the beach from which they were collected. Daytime release will increase the chances of hatchlings being predated by diurnal fish and birds (e.g. frigate birds). It is important to vary the location of hatchling release sites along a beach so as not to encourage predator build up at certain areas. After excavation and data collection, return all leftover eggshells and other nest contents to the nest cavity and cover with sand. This material provides nutrients and energy for the beach ecosystem. If you are unsure about this methodology, refer to Miller (1999)

and ask TCOT personnel to demonstrate a nest excavation during subsequent field visits.

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You're on holiday.
You're relaxed.
You've left your cares behind.

While you're on holiday, don't forget that people aren't the only animals that need clean seas and sunny beaches. Marine turtles also depend on these places and there are a few very simple things you can do to be sure you are not making their survival any harder than it already is.



Marine turtles under threat

Marine turtles have been swimming the world's oceans for millions of years. Over the last century they have been subject to massive over-exploitation and sadly, marine turtles are now threatened with extinction.



© Matthew Godfrey

tourism

Turtles and tourism can coexist, but sensitive planning is essential. Uncontrolled coastal development can destroy turtle nesting beaches. Artificial light at night can disturb nesting turtles and lead hatchlings away from the sea.

If marine turtles vanish, many coastal communities will have lost a way of life, as well as a valuable natural resource, and we will all have lost a treasured symbol of grace, longevity, fertility and endurance.

trade

It is illegal to take turtle products across international borders without prior permission from relevant government authorities. Trade in marine turtle eggs, meat and shells has left many populations of turtles in serious trouble.



© Peter Richardson



© Peter Richardson/MCS

litter

Litter, particularly plastic, can float in the ocean for years. Turtles and other marine creatures can be killed if they get entangled in litter or mistake it for their prey.

fishing

Each year marine turtles accidentally get entangled and drown in fishing gear. Worldwide, this accounts for tens of thousands of turtle deaths.



© Jennifer Gray/ Bermuda Turtle Project

We would like to hear from you. If you have seen a turtle or if you have seen turtle products for sale, please complete and detach this form and return it to the address shown overleaf.

Name

Home contact address

Postcode

Telephone

e-mail

☐ We would like to use the information you provide us with to enhance our knowledge of marine turtles. Please tick this box only if you do not want us to use this information.

What did you see? (Please tick the appropriate boxes below)

live turtle

☐

dead turtle

☐

turtle product for sale

☐

meat

☐

shell

☐

eggs

☐

other

☐

green turtle

☐

leatherback turtle

☐

loggerhead turtle

☐

hawksbill turtle

☐

Kemp's ridley turtle

☐

unsure

☐

Where did you see the turtle/turtle products on sale? (Please give the name of the place, including the country, and the name of the nearest town or known landmark or co-ordinates at sea).

Date and time:

What were you doing?

fishing

☐

snorkelling

☐

sailing

☐

other

☐

shopping

☐

walking on the beach

☐

scuba diving

☐

Would you be happy for us to contact you to find out more about what you have seen?

yes☐

no☐

IF YOU WOULD LIKE TO SUPPORT MARINE TURTLE CONSERVATION, PLEASE MAKE A DONATION TO THE ORGANISATION WHOSE ADDRESS IS SHOWN ON THE REVERSE OF THIS FORM.

Turtles in the Caribbean Overseas Territories (TCOT) marine turtle survey

Please
affix a
stamp.
Thank you.

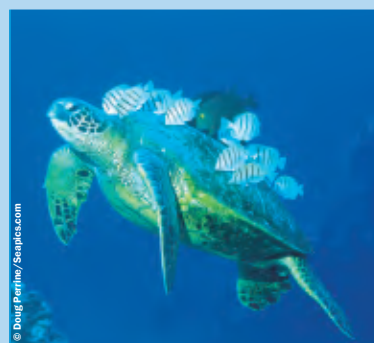
Thanks for your help!



HAWKSBILL TURTLE
(*Eretmochelys imbricata*)
LENGTH: up to 1.2 metres
COLOUR: brown, amber and black tortoiseshell pattern
DISTINCTIVE FEATURES: shell scales overlapping, narrow tapered head with bird-like beak, back edge of shell serrated.



LOGGERHEAD TURTLE
(*Caretta caretta*)
LENGTH: adults up to 1.5 metres
COLOUR: reddish brown
DISTINCTIVE FEATURES: large head, markedly thick shell and non-overlapping scales.



GREEN TURTLE
(*Chelonia mydas*)
LENGTH: up to 1.5 metres
COLOUR: adults dark olive or grey with dark blotches, juveniles have chestnut coloured shell
DISTINCTIVE FEATURES: smooth shell, rounded (not angular) facial profile, non-overlapping scales.

LEATHERBACK TURTLE
(*Dermochelys coriacea*)
LENGTH: up to 2 metres
COLOUR: black, often spotted with white
DISTINCTIVE FEATURES: large, up to 500kg, pronounced longitudinal ridges on shell, which tapers to a blunt point.



KEMP'S RIDLEY TURTLE
(*Lepidochelys kempi*)
RARELY RECORDED IN THE CARIBBEAN UK OVERSEAS TERRITORIES
LENGTH: up to 80cm COLOUR: olive green above and yellowish below
DISTINCTIVE FEATURES: colouration pale, carapace relatively short and wide, non-overlapping scales.



This leaflet was produced by



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SOCIETY
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C&G Cheltenham & Gloucester



Turtles in the Caribbean Overseas Territories (TCOT) is a 3-year project coordinated by the Marine Turtle Research Group (University of Wales, Swansea) and the Marine Conservation Society/UK. TCOT is funded by the UK Department of Environment, Food and Rural Affairs (DEFRA) and the UK Foreign and Commonwealth Office Environment Fund for the Overseas Territories (FCO-EFOT). For more information e-mail info@tcot.seaturtle.org or visit www.seaturtle.org/mtrg/projects/tcot/

YOU CAN HELP

- Always dispose of your litter responsibly. Plastic bags and other marine litter can kill turtles.
- Never drive on turtle nesting beaches as this can crush nests.
- Avoid using flashlights at night on turtle nesting beaches as this can disturb nesting females and disorientate hatchlings.
- To avoid boat strike, always pilot boats with care near marine turtle habitat such as coral reefs and seagrass beds.

Use the attached coupon to let us know about your turtle encounters. Copies of any photographs taken of turtles or turtle products on sale would also be of use to us.

TURTLE WATCHING

Turtle watching is always a magical experience and you will remember it for the rest of your life. Do make the effort to go and see turtles if you can, but remember...

If you are visiting a nesting beach, ALWAYS go with an experienced guide and follow their instructions. Support local projects whenever you can, this way you can make a direct contribution to conservation.

Keep your distance. Whether nesting, swimming or at rest, turtles don't like you to get too close. Underwater a calm turtle will be quite happy for you to watch from a comfortable distance - but if you try to touch a turtle it will swim away.

TCOT IS WORKING IN PARTNERSHIP WITH: The University of Western Ontario, The University of Wales, Cardiff, as well as the Anguilla Department of Fisheries and Marine Resources, the Anguilla National Trust, the Bermuda Turtle Project, the British Virgin Islands Conservation and Fisheries Department, the BVI National Parks Trust, the Cayman Islands Department of Environment, the Cayman Turtle Farm, the Government of Montserrat, the Montserrat National Trust and the Turks & Caicos Islands Department of Environment and Coastal Resources. TCOT also acknowledges the support of WIDECAST and seaturtle.org.

© Front cover photographs: Turtle hatchling - Ben Osborn. Tourists watching nesting leatherback - Mathew Godfrey. Hawksbill turtle - Jeremy Stafford Deitsch. Leaflet design by: Sue Ranger/MCS

marine turtles and tourism



how you can help



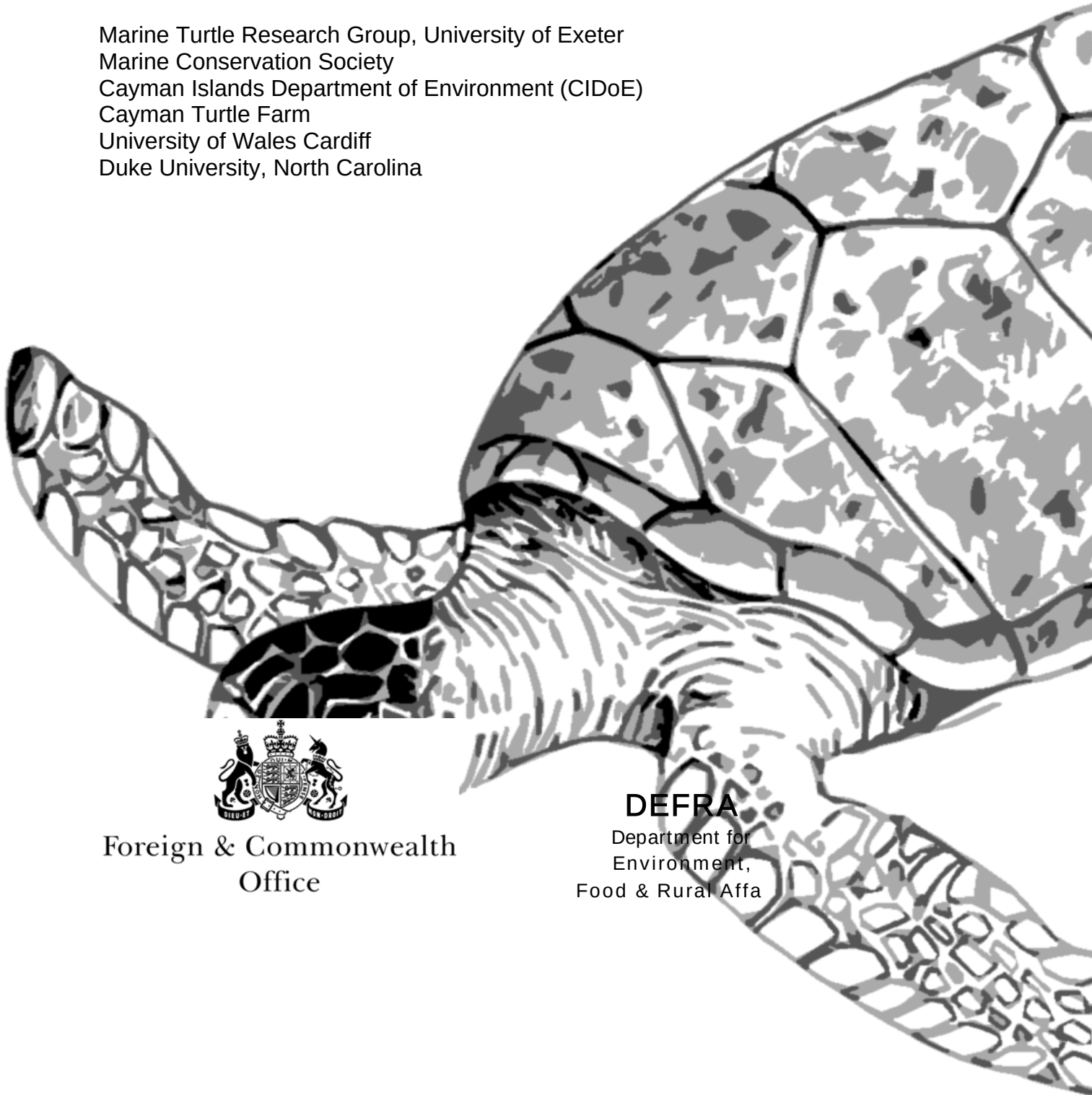
Bibliography of Marine Turtles in the UK Overseas Territories.

Marine Turtle Research Group, University of Exeter
Marine Conservation Society
Cayman Islands Department of Environment (CIdoE)
Cayman Turtle Farm
University of Wales Cardiff
Duke University, North Carolina



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CONTENTS

	Page Number
Foreword	2
Important General References	3-5
Anguilla	6-7
Ascension Island	8-11
Bermuda	12-16
British Indian Ocean Territory	17
British Virgin Islands	18-24
<i>US Virgin Islands</i>	20-24
Cayman Islands	25-32
Gibraltar	33
Montserrat	34
The Pitcairn Islands	35
St Helena	36
Turks & Caicos Islands	37
Selected references relating to the Caribbean	38-42

FOREWORD

This publication is an output of the DEFRA (Department for Environment, Food and Rural Affairs) and FCO (Foreign and Commonwealth Office) sponsored initiative, "Turtles in the Caribbean Overseas Territories (TCOT)" project. It will be sequentially updated and circulated freely in an electronic form. For the most recent version, please contact **Marine Turtle Research Group, Centre for Ecology and Conservation, University of Exeter in Cornwall, Tremough Campus, Penryn TR10 9EZ, UK, or email: mtrg@seaturtle.org**

The bibliography has been assembled from a diversity of sources, including the personal libraries of project members and from the On-Line Bibliography of the Archie Carr Center for Sea Turtle Research <<http://accstr.ufl.edu/biblio.html>>. Additional citations and assistance was provided by Andrew Kesteloot, Dave Owens and Jennifer Gray.

No relevant literature are as yet available for the British Antarctic Territory, Falkland Islands, Tristan da Cunha or South Georgia/Sandwich Islands and thus these Overseas Territories are not listed in this bibliography. For comparative purposes, a sub-section for the US Virgin Islands has been included under the heading of the British Virgin Islands owing to their geographic proximity and the wealth of information available from USVI.

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The Way Ahead



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Hawksbill turtle (*Eretmochelys imbricata*) hatchlings - Turks & Caicos islands

The UK Government is committed to contributing to regional management of marine turtles in the Caribbean by addressing critical gaps in the knowledge of marine turtles in the UK Overseas Territories and reviewing turtle management policies to assess their conservation impacts and relative benefits. This is in line with the recommendations made at the CITES Caribbean Hawksbill Turtle Range State Dialogue meetings. TCOT will assist in meeting these objectives with the current research initiatives including:

- Nesting beach surveys in Anguilla, British Virgin Islands (BVI), Cayman, Montserrat and Turks & Caicos Islands (TCI)
- Foraging site surveys in Anguilla, BVI, Cayman Islands, Montserrat and TCI
- Genetic sampling and tagging in Anguilla, BVI, Cayman Islands, Montserrat and TCI
- Socio-economic surveys in each Territory
- 'Caribbean TURTLEWATCH', a voluntary recreational diver survey of turtle foraging habitat in each Territory
- 'Turtles and Tourism' awareness programme and voluntary survey in each Territory



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Examining a green turtle (*Chelonia mydas*) hatchling - Montserrat Department of Fisheries

TCOT is coordinated by the Marine Turtle Research Group, University of Wales, Swansea and the Marine Conservation Society (MCS), in association with the University of Wales, Cardiff, The University of Western Ontario, Canada, the Cayman Islands Department of Environment and the Cayman Turtle Farm. TCOT also acknowledges the support of WIDECAST and Seaturtle.org.

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FOR MORE INFORMATION VISIT www.seaturtle.org/mtrg/projects/tcot



**The Marine Turtle Research Group,
University of Wales, Swansea**

The Group carries out marine turtle research and conservation projects in Brazil, Cyprus, Guinea Bissau, the UK and the UK Overseas Territories including Ascension Island.

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The Marine Conservation Society

MCS is the UK charity dedicated to the protection of the marine environment and its wildlife and is joint lead partner in the UK Marine Turtles Grouped Species Action Plan. The MCS Marine Turtle Conservation Programme is supported by Cheltenham & Gloucester plc.

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TURTLES

*in the Caribbean UK
Overseas Territories*



Background

The exploitation of marine turtles in the Caribbean has generated an extraordinary level of international concern in recent years. The CITES Caribbean Hawksbill Turtle Range State Dialogue process has led to a general agreement among Range States to work towards a regional management strategy for the hawksbill turtle in the Caribbean.

Green, hawksbill, leatherback and loggerhead turtles occur in the six UK Overseas Territories in the Caribbean region. While legal turtle harvests continue in four of these Territories, there is currently little understanding of the impact of these harvests on Caribbean marine turtle populations. In recognition of the need for a regional management approach, the Turtles in the Caribbean Overseas Territories (TCOT) research project is the United Kingdom's contribution to furthering the understanding of marine turtle ecology and exploitation in the Caribbean.

TCOT was launched in November 2001 and is now carrying out a programme of habitat monitoring, genetic stock analysis and socio-economic surveys, in order to assess the status and evaluate the use of marine turtles in the UK Overseas Territories in the Caribbean.

Based on the data from this research, TCOT will produce a series of recommendations in 2004, which will be provided to the Governments of Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos Islands and the UK. These recommendations will be used to shape the future conservation, monitoring and management of marine turtle populations in these Territories.

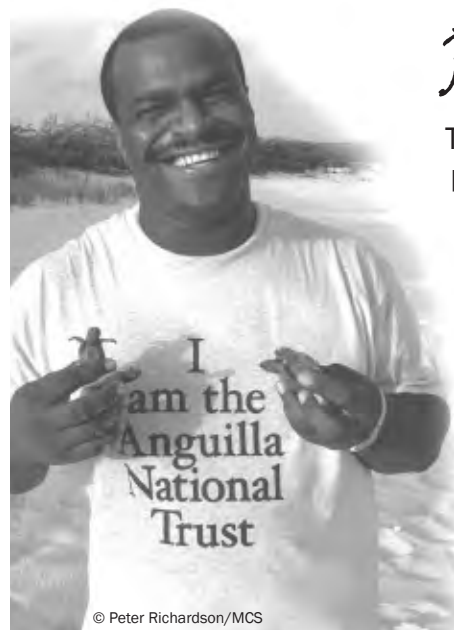


© Peter Richardson/MCS

An adult female green turtle (*Chelonia mydas*) taken in the legal harvest in the Turks & Caicos Islands

Partnerships

The TCOT team works with local project partners in each UK Overseas Territory, who are integral to TCOT data collection, analysis and assessment. These project partners came together in Grand Cayman in August 2002 to take part in the first TCOT workshop. Twenty-five participants shared their skills at the workshop and were further trained in nesting beach surveying, in-water capture, turtle tagging and genetic sampling, as well as socio-economic survey administration.



© Peter Richardson/MCS

British Virgin Islands

Project partners: Conservation and Fisheries Department and British Virgin Islands National Trust.

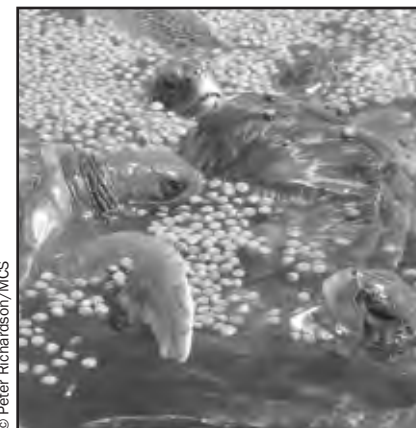
There is a legal harvest of green, hawksbill and loggerhead turtles and a voluntary moratorium on leatherbacks. The Conservation and Fisheries Department have been monitoring leatherback nesting beaches on Tortola for over a decade. Recent TCOT surveys suggest that there may be regionally important nesting and foraging hawksbill and green turtle populations at Anegada.



© Brendan Godley/MTRG

A turtle fisherman helping with In-water sampling (*Chelonia mydas*) British Virgin Islands

Cayman Islands



© Peter Richardson/MCS

Feeding time - Cayman Turtle Farm

The CIDoE have been monitoring marine turtle populations in recent years. TCOT will analyse the market for turtle products in the Cayman Islands and assess the impact of the Cayman Turtle Farm 'head-start' programme on local green turtle populations. Recent surveys confirm that head-started green turtles released from the Cayman Turtle Farm in the 1980's are returning to the Cayman Islands to breed.



© Peter Richardson/MCS

In-water sampling of foraging hawksbill turtles (*Eretmohelys imbricata*) - Cayman islands

Project partners: Cayman Islands Department of Environment (CIDoE), Cayman Turtle Farm

There is a legal harvest of green, hawksbill and loggerhead turtles as well as legal trade in green turtle meat produced at the Cayman Turtle Farm.

Bermuda

Project partners: The Ministry of Environment and the Bermuda Turtle Project (BTP)

All turtles are afforded absolute protection. The BTP runs one of the longest in-water marine turtle studies in the world and will be sharing their findings and expertise with TCOT. Their genetic analyses link Bermuda's foraging hawksbill population with populations in Costa Rica, Cuba, Mexico and the US Virgin Islands. The BTP contribute to regional capacity building through an annual training course.



© Christopher Scott Boykin/Bermuda Turtle Project

A student on the Bermuda Turtle Project course.

Montserrat

Project partners: Department of Fisheries and the Montserrat National Trust

There is a legal harvest of marine turtles in Montserrat. Green, hawksbill and leatherback turtles are known to nest in Montserrat and surveys have revealed that turtles are beginning to nest on beaches created by the volcanic eruption in 1995.

Anguilla

Project partners: Department of Fisheries (DFMR) and Marine Resources and the Anguilla National Trust

Anguilla has imposed a 10-year moratorium on marine turtle harvest. Former turtle fishermen are calling for changes in the management of the turtle fishery and are suggesting a limited and highly regulated harvest.

Turks and Caicos Islands

Project partners: Department of Environment and Coastal Resources (DECR)

There is a legal harvest of green, hawksbill and loggerhead turtles. Preliminary TCOT appraisals suggest turtle exploitation is more extensive than anticipated. Initial DECR in-water sampling has been catalysed by cooperation with turtle fishermen and indicates that resident juvenile green turtle populations may be afflicted by fibropapilloma, a potentially lethal disease.



© Peter Richardson/MCS

In water sampling (*Chelonia mydas*) Turks & Caicos Islands



Marine Conservation Society

The UK Charity dedicated to the protection of the marine environment and its wildlife
Registered Charity No. 1004005

PRESS RELEASE

PRESS RELEASE: Embargoed 00:00 hrs, Thursday 15th November 2001.

UK TO INVESTIGATE MARINE TURTLE EXPLOITATION IN THE OVERSEAS TERRITORIES

London, 15th November 2001. A ground-breaking project to investigate the exploitation of endangered¹ marine turtle populations in the Caribbean UK Overseas Territories is launched today by the Department for Environment, Food and Rural Affairs (DEFRA), the University of Wales and the Marine Conservation Society (MCS).

The 3-year, DEFRA-funded project is spearheaded by the University's Marine Turtle Research Group² in association with the MCS³. The project will involve a coalition of organisations⁴ and will focus on turtles found in the UK Overseas Territories of Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands.

"This is the first time that significant funding has been made available to research the marine turtle populations found in the Caribbean UK Overseas Territories" said Environment Minister Michael Meacher, *"This initiative shows the Government's commitment to fulfill its responsibility towards the global conservation of critically endangered species"*.

Four species of marine turtle regularly nest on the beaches or feed in the waters of the Caribbean UK Overseas Territories, including the critically endangered hawksbill turtle and the endangered green turtle. For centuries the hawksbill has been hunted in the Caribbean for its beautiful shell, used to make 'tortoiseshell', while Caribbean populations of the green turtle were decimated to supply Europe's insatiable appetite for turtle soup.

Despite a ban on all international trade in marine turtle products under the Convention on International Trade in Endangered Species (CITES) in 1977, tortoiseshell items continue to be illegally traded in the Caribbean, where unsuspecting tourists provide the main market while four Territories still allow legal, subsistence-level turtle harvests⁵.

The project team aim to work with local expertise and help establish long-term research programmes in each Territory. Through exhaustive field research and genetic stock analysis the team will assess the status of the marine turtle populations at nesting beaches and foraging grounds while evaluating legal and illegal turtle harvests through socio-economic surveys.

“Through this project we aim to understand the local, cultural and economic importance of turtle harvests in the Overseas Territories and begin to assess their impact on regional turtle populations” said Dr Brendan Godley of the Marine Turtle Research Group, “In three years time we hope to be in a position to make recommendations for the conservation and management of the Caribbean turtle populations”.

DEFRA allocated funding for this research in recognition of the need for regional, cooperative management of Caribbean hawksbill populations after Cuba’s proposal to reopen international trade in hawksbills turtles was rejected at a CITES meeting last year.

“Little is known about the marine turtle populations inhabiting the UK Overseas Territories, but we do know that some populations are close to extinction” said Peter Richardson, MCS Species Policy Officer “These populations won’t recover overnight, in fact it takes years to implement effective, long-term recovery programmes. But this UK initiative is a very welcome first step towards a brighter future for turtles in the Caribbean UK Overseas Territories”. Ends

Editor’s notes:

- 1) The World Conservation Union (IUCN) recognizes seven species of marine turtle. The four species regularly found in Caribbean UK Overseas Territories are the hawksbill, green, leatherback and loggerhead turtles. IUCN list the hawksbill and leatherback turtles as critically endangered, whereas the green and loggerhead turtles are listed as endangered.
- 2) **The Marine Turtle Research Group (MTRG)**<www.seaturtle.org/mtrg>, University of Wales Swansea carries out research and conservation projects regarding turtles in UK waters, Mediterranean and the British Overseas Territories including Cayman Islands and Ascension Island. MTRG staff edit the international Marine Turtle Newsletter <www.seaturtle.org/mtn>.
- 3) The Marine Conservation Society (MCS) is the UK Charity dedicated to the protection of the marine environment and its wildlife. Since its formation in 1983 MCS has become a recognised authority on marine and coastal conservation and is regularly consulted by Government for its views on a range of marine issues including fishing. MCS provides information and guidance on many aspects of marine conservation and produces the annual *Good Beach Guide*, as well as promoting public participation in volunteer projects and surveys such as *Adopt-a-Beach*, *Seasearch* and *Basking Shark Watch*. MCS is currently joint lead partner on the Marine Turtle Grouped Species Action Plan for UK waters and the UK Overseas Territories.
- 4) This DEFRA-funded project will be led by the Marine Turtle Research Group and Marine Conservation Society and will involve collaborative work with the Cayman Island Department of Environment, the Cayman Turtle Farm, the University of Western Ontario, the University of Wales, Cardiff and US leatherback turtle expert Dr. Peter Dutton.
- 5) Regulated turtle fisheries are currently allowed in the British Virgin Islands, the Cayman Islands, Montserrat and the Turks and Caicos Islands, while Anguilla has declared a five-year moratorium on turtle hunting. Marine turtles are completely protected in Bermuda.

For further information and photographs please contact:

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Marine Conservation Society

The UK charity dedicated to the protection of the marine environment and its wildlife
Registered Charity No. 1004005

PRESS RELEASE

PRESS RELEASE: Embargoed 00:01 hrs, Wednesday 21st August 2002.

RESEARCH INTO ENDANGERED CARIBBEAN TURTLES GETS BOOST FROM UK SUPPORT

London, 22nd August 2002. This weekend UK marine turtle specialists from the University of Wales, Swansea and the Marine Conservation Society (MCS) will initiate a 7-day research workshop in the Cayman Islands, which aims to give biologists in the UK Overseas Territories new research skills allowing them to further investigate the status of their endangered marine turtle populations.

Researchers from Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands will attend the workshop, which is funded by the Foreign and Commonwealth Office's Environment Fund for the Overseas Territories, and is part of a 3-year UK Government sponsored project called *Turtles in the Caribbean Overseas Territories* (TCOT).

FCO Minister Dr Denis MacShane said: *'This is the first workshop of its kind to be held in the Caribbean UK Overseas Territories. The Foreign Office funding is proof of this Government's commitment to the conservation of endangered marine turtle populations in the region'.*

The workshop will be coordinated by the TCOT team of specialists from the Marine Turtle Research Group of the University of Wales Swansea, the Marine Conservation Society and the University of Western Ontario, and will be hosted by the Cayman Island Department of Environment and the Cayman Turtle Farm. Participants will bring their existing skills to the workshop and will be trained in nesting beach surveying, reef surveying, turtle tagging, genetic sampling and analysis, as well as how to conduct socio-economic surveys of turtle fishermen, turtle meat sellers and tourists.

Since its launch in October last year, the TCOT project has been working with local partners to assess the status of endangered marine turtles and their exploitation in the six Overseas Territories. After 3 years and through a comprehensive programme of scientific research and social surveys, the TCOT team aims to collect and analyse enough data in order to provide the UK and Overseas Territory Governments with specific recommendations to improve the conservation management of the endangered turtle populations found in each Territory.

'We are very pleased that biologists from all Overseas Territories in the region are coming to the workshop' said Dr Brendan Godley, TCOT coordinator from the University of Wales *'Only through these long-term capacity building exercises can we hope to ensure that the Overseas Territories will be able to carry out the research needed to understand how to successfully conserve their endangered marine turtle populations for generations to come'* **Ends**

For further information, photographs and video please contact:

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Editor's notes:

1. **Turtles in the Caribbean Overseas Territories (TCOT)** is a 3-year project funded by the UK Department of Environment, Food and Rural Affairs (DEFRA), with additional funding for training and capacity building initiatives from the UK Foreign and Commonwealth Office Environment Fund for the Overseas Territories (FCO-EFOT). TCOT is coordinated by the University of Wales and the Marine Conservation Society, in association with the University of Western Ontario and the University of Cardiff. Overseas Territories partners include: **Anguilla** - Department of Fisheries and the Anguilla National Trust; **Bermuda** – The Ministry of the Environment; **British Virgin Islands** – Conservation and Fisheries Department, BVI National Trust; **Cayman Islands** – Department of Environment, Cayman Turtle Farm; **Montserrat** – Government of Montserrat, Montserrat National Trust; **Turks & Caicos Islands** – Department of Environment and Coastal Resources.
2. The World Conservation Union (IUCN) recognizes seven species of marine turtle. Four species are known to nest and forage within the UK Overseas Territories in the Caribbean, including the leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*) and green (*Chelonia mydas*) turtles. There are unconfirmed reports of Kemp's ridley turtles (*Lepidochelys kempii*) having been spotted in the waters of some Territories. The IUCN lists the hawksbill, leatherback and Kemp's ridley turtles as critically endangered, whereas the green and loggerhead turtles are listed as endangered.
3. **The Marine Turtle Research Group**, University of Wales Swansea carries out research and conservation projects regarding turtles in UK waters, Mediterranean and the UK Overseas Territories including Cayman Islands and Ascension Island. Staff edit the international Marine Turtle Newsletter (www.seaturtle.org/mtn). Contacts: *Dr Brendan Godley & Dr Annette Broderick* 01792 554139
4. The **Marine Conservation Society (MCS)** is the UK Charity dedicated to the protection of the marine environment and its wildlife. The MCS Marine Turtle Conservation Programme is supported by Cheltenham & Gloucester plc. Contact: *Peter Richardson* 01989 566017
5. FCO-EFOT provided £31,180 for the workshop. It has also contributed an additional £62,659 over a four year period for the training and capacity building elements of the £145,000 DEFRA-funded TCOT project. The £500,000 per annum FCO-EFOT was established in 1999 following the White Paper 'Partnership for Progress and Prosperity'. Its aims are: to support the sustainable management of the environment of the Overseas Territories and to ensure that their rich biodiversity remains an asset for present and future generations; to increase public participation in, and enjoyment of, the economic, social and spiritual benefits of a healthy environment with a flourishing variety of natural habitats and species; and to extend the participation of the Overseas Territories in regional and international environmental activities. Further information on FCO-EFOT can be found at www.fco.gov.uk/environment or from Trish O'Donnell in the FCO Press Office on 020 7270 3114.
6. Details of the TCOT project can be found at www.seaturtle.org/mtrg/projects/tcot/index.shtml



Marine Conservation Society

The UK Charity dedicated to the protection of the marine environment and its wildlife
Registered Charity No. 1004005

PRESS RELEASE

PRESS RELEASE: Embargoed 00:01hrs, Friday 15th August 2003

CONSERVATION OFFICERS FROM THE UK'S CARIBBEAN OVERSEAS TERRITORIES LEARN HOW TO SAVE ENDANGERED TURTLES

15.08.03 - This week the Foreign and Commonwealth Office (FCO) increased its support for the conservation of endangered marine turtles in the Caribbean by funding the participation of government conservation officers from the region's UK Overseas Territories¹ in a groundbreaking workshop on the island of Bermuda.

The workshop is coordinated by the Bermuda Turtle Project (BTP)², a joint research initiative of the Bermuda Aquarium (BAMZ) and the Caribbean Conservation Corporation (CCC). Participants take part in the BTP's annual research, when each day for two weeks, turtles are captured in a 2,000 foot-long net, studied and then released back into the wild. The participants develop skills, from catching, measuring and tagging turtles, to taking blood samples for genetic analysis. The participants also discuss relevant scientific papers on marine turtle biology and debate contemporary conservation issues. This year's course also included an added bonus when the participants fitted one of the captured turtles with a state-of-the-art satellite transmitter to help understand marine turtle migration³. The combination of hands-on science and literature discussion gives participants an understanding of crucial scientific and conservation issues.

"This course is exciting for me because I have learned things I never knew before" said Carlos Sasso, Fisheries Officer with Anguilla's Department of Fisheries and Coastal Resources, "It's good that someone like me can learn these skills, take them home and pass them on to the others in the Department. It's good for the staff and it's good for the turtles too!"

Participants from Anguilla, British Virgin Islands, Cayman Islands, Grenada, St Lucia, Turks and Caicos Islands and the USA arrived in Bermuda last week to kick off the workshop, which is run by BTP Coordinator, Jennifer Gray, and CCC research associates Drs Peter and Anne Meylan. UK Overseas Territory Government departments are partners in the Turtles in the Caribbean Overseas Territories (TCOT)⁴ project. TCOT is a UK Government funded project coordinated by the Marine

Turtle Research Group⁵ and the Marine Conservation Society (MCS)⁶. The FCO Environment Fund's⁷ support of the Bermuda workshop is a contribution to TCOT's efforts to build turtle conservation and research capacity in the UK Overseas Territories.

"The workshop is highly intensive and the participants always go home with a huge amount of information, but each year we find we also learn from them, it's a two-way learning process!" said Jennifer Gray, BTP Coordinator, *"We hope that the workshop inspires the participants to set up marine turtle conservation and research projects back home and help the struggle to save the Caribbean's endangered turtle populations⁸".* **Ends**

Stunning photographs and video of the participants catching and tagging turtles in Bermuda's azure seas are available for media use. The participants will also be available for interviews during the workshop on the 13th, 14th & 15th August 2003. For more information contact:

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Editor's notes:

1. Anguilla, Cayman Islands, Bermuda, British Virgin Islands, Montserrat and the Turks and Caicos Islands are all UK Overseas Territories.
2. The Bermuda Turtle Project (BTP) www.cccturtle.org/bermuda, a collaborative research initiative of the Bermuda Aquarium Museum and Zoo (BAMZ) and the Caribbean Conservation Corporation (CCC), has as its mission to "promote the conservation of marine turtles through research and education". Founded in 1926, the Bermuda Aquarium, Museum & Zoo (BAMZ) www.BAMZ.org is committed to inspire appreciation and care of island environments. It is supported by the Bermuda Zoological Society (BZS) and U.S.-registered Friends of the Bermuda Aquarium (FOBA). The BAMZ fulfils its mission through animal habitat exhibits, which focus on species from oceanic islands, as well as related conservation, education and research programmes. The Caribbean Conservation Corporation (CCC) www.cccturtle.org is a non-profit organization concerned solely with the conservation of marine turtles. It is based in Gainesville, Florida.
3. In recent years marine turtle researchers have been using satellite telemetry to track turtle migrations. Satellite transmitter tags are attached to the shell of the turtle so that every time the turtle surfaces to breathe, the tag transmits the turtle's position, as well as other information (e.g. depth of turtle's last dives), to satellites orbiting above, which then relay the data by e-mail to the computer of the scientist who attached the tag.
4. Turtles in the Caribbean Overseas Territories (TCOT) was launched in 2001 and is a 3-year project funded by the Foreign and Commonwealth Office and the Department of Environment, Food and Rural Affairs (Defra). TCOT aims to assess the status of marine turtles and their exploitation in the UK Overseas Territories in the Caribbean.
5. The Marine Turtle Research Group (MTRG) www.seaturtle.org/mtrg, University of Wales Swansea carries out research and conservation projects regarding turtles in UK waters, Mediterranean and the UK Overseas Territories including Cayman Islands and Ascension Island. MTRG staff edit the international Marine Turtle Newsletter www.seaturtle.org/mtn.
6. The Marine Conservation Society (MCS) is the UK Charity dedicated to the protection of the marine environment and its wildlife. Since its formation in 1983, MCS has become a recognised authority on marine and coastal conservation and is regularly consulted by Government on a range of marine issues. MCS produces the annual *Good Beach Guide*, as well as promoting public participation in volunteer projects and surveys such as *Adopt-a-Beach*, *Seasearch* and *Basking Shark Watch*. With support from the Cheltenham & Gloucester, MCS is joint lead partner of the Marine Turtle Grouped Species Action Plan for UK waters and the UK Overseas Territories.
7. The FCO has a global network of missions, and the Environment Fund (now brought under the umbrella of the Global Opportunities Fund) utilises this network in association with NGOs, governments and institutions to support a range of focused, high quality environment projects that will contribute to the UK's international environment policy objectives.
8. The World Conservation Union (IUCN) recognizes seven species of marine turtle. The leatherback turtle (*Dermochelys coriacea*) is the largest and is listed as *critically endangered*, as are the Kemp's ridley turtle (*Lepidochelys kempi*) and the hawksbill turtle (*Eretmochelys imbricata*). The loggerhead turtle (*Caretta caretta*), green (*Chelonia mydas*) and olive ridley (*Lepidochelys olivacea*) turtles are listed as *endangered* and Australia's flatback turtle (*Natator depressus*) is listed as *Data deficient*. Green, hawksbill, leatherback and loggerhead turtles forage and nest throughout the Caribbean, whereas Kemp's and olive ridley turtles are occasional visitors. The flatback turtle nests only on the coast of Australia.





The person who sent this card is supporting Turtles in the Caribbean Overseas Territories (TCOT), an international collaborative initiative funded by the UK Government. TCOT aims to assess the status and exploitation of marine turtles in the UK Overseas Territories in the Caribbean and assist research and conservation initiatives.

For more information visit <http://seaturtle.org/mtrg/projects/tcot> or contact info@tcot.seaturtle.org

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