



General Introduction and Methods



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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.

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**

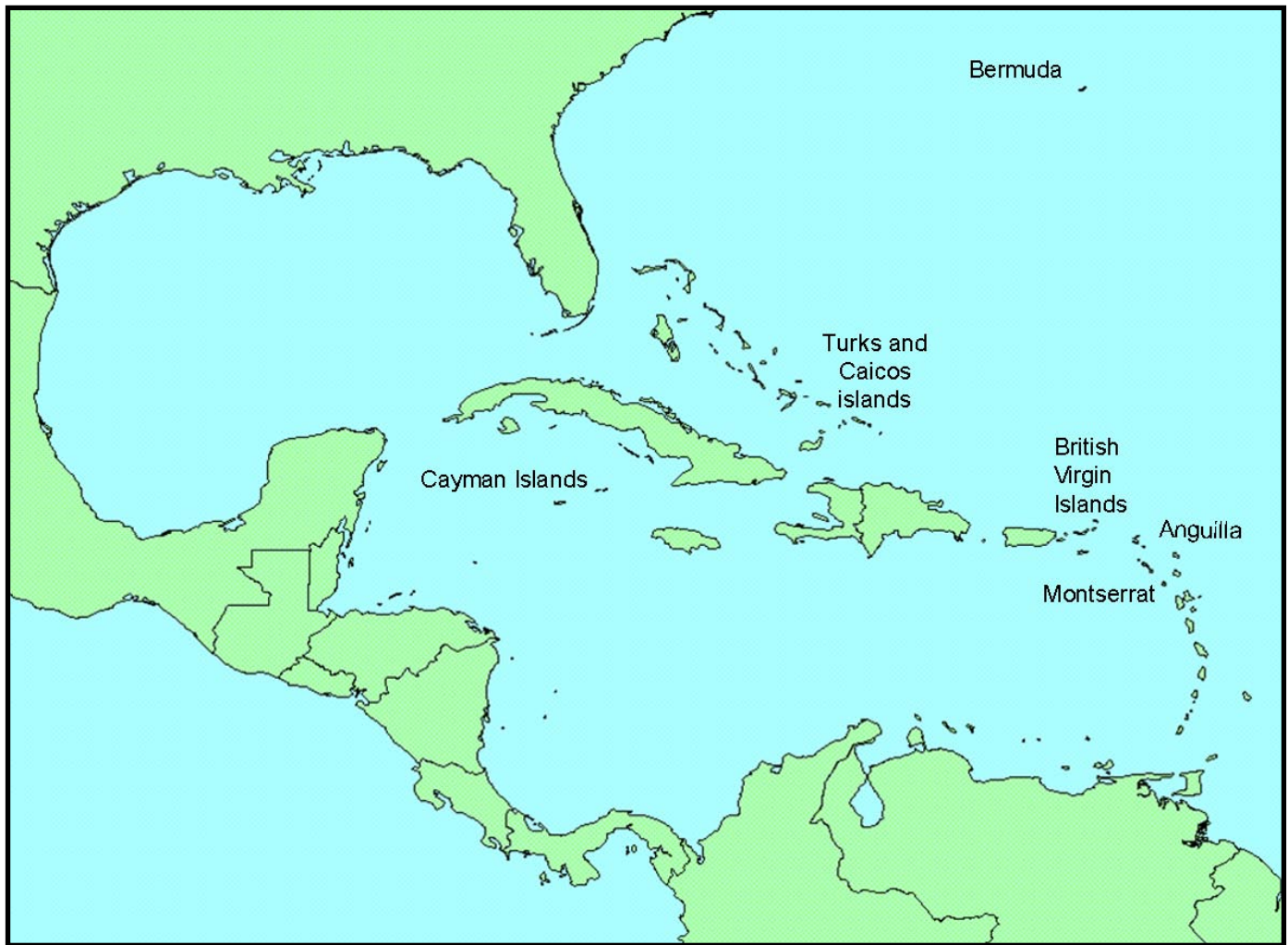


Figure 2.1. Geographic coverage of the TCOT project.

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).

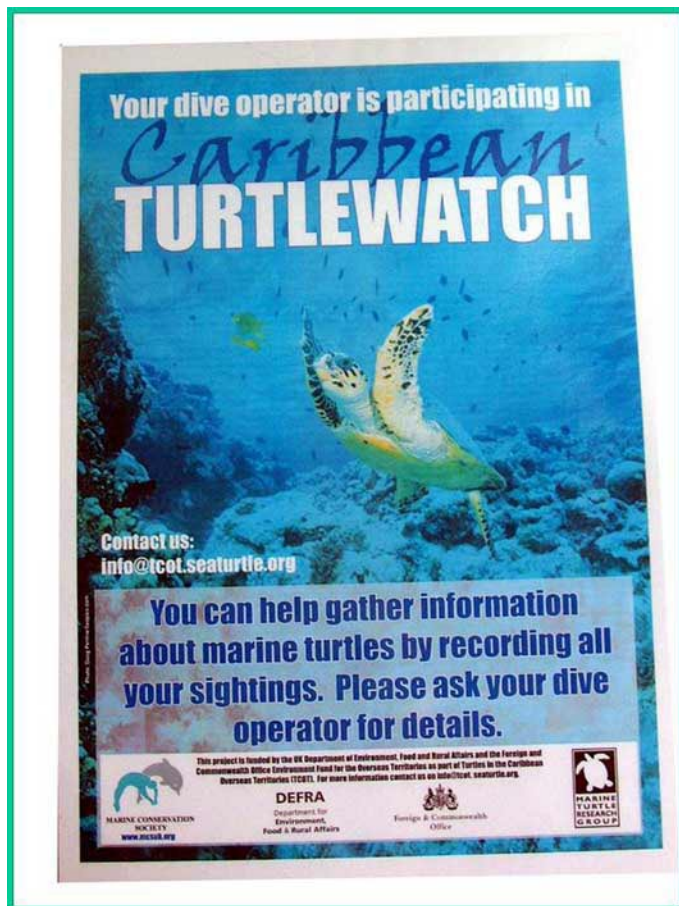


Photo 2.7. Caribbean Turtlewatch.

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:

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