



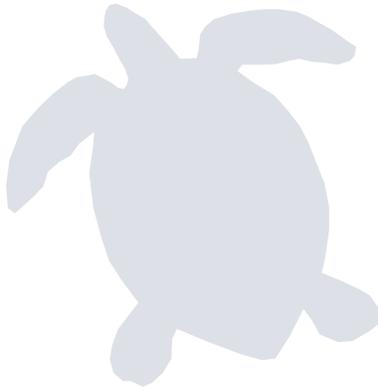
# An Assessment of the Status and Exploitation of Marine Turtles in Anguilla



Foreign & Commonwealth  
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Department for Environment  
Food and Rural Affairs



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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

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## 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
<b>Green Turtle</b> ( <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
<b>Hawksbill Turtle</b> ( <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
<b>Leatherback Turtle</b> ( <i>Dermochelys coriacea</i> )	Small numbers	Rarely encountered	No adult harvest reported since moratorium Low levels of illegal egg harvest
<b>Loggerhead Turtle</b> ( <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](http://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 1<sup>st</sup> of April to the 30<sup>th</sup> 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 17<sup>th</sup> Century and until the early 20<sup>th</sup> 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 85,500km<sup>2</sup>, 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.

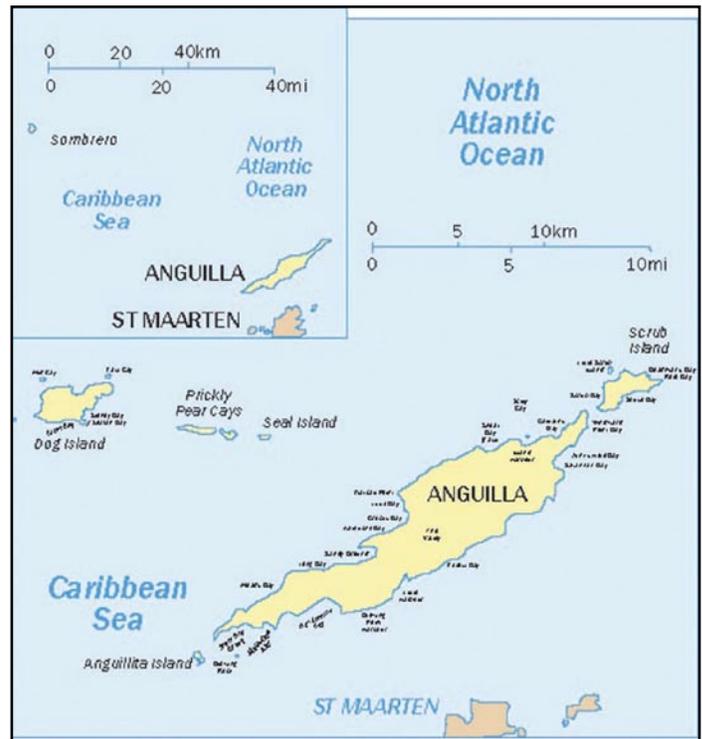


Figure 4.1. Map of Anguilla

#### 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 (WIDECAS) and the Bellairs Research Institute in Barbados. With WIDECAS, 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 WIDECAS 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.

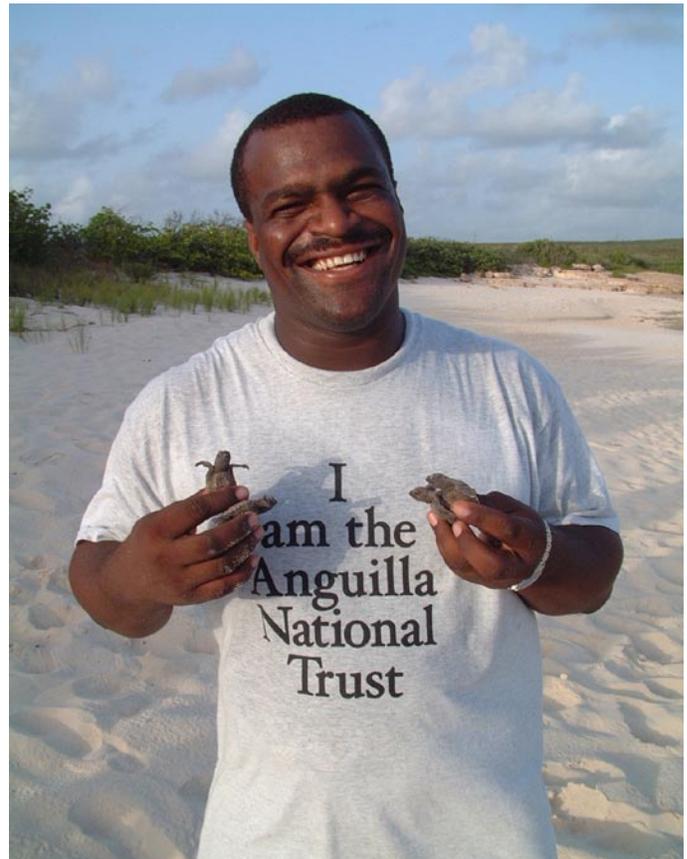
b) In order to make best use of available resources, ensure that every opportunity to carry out marine turtle research and monitoring in tandem with other essential fisheries research and monitoring is fully utilised.

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 5<sup>th</sup> April to the 22<sup>nd</sup> September 2001 (K. Hodge (Government of Anguilla) pers. comm. 2003). No systematic nesting data was collected during 2002 and from 17<sup>th</sup> June to the 12<sup>th</sup> 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.

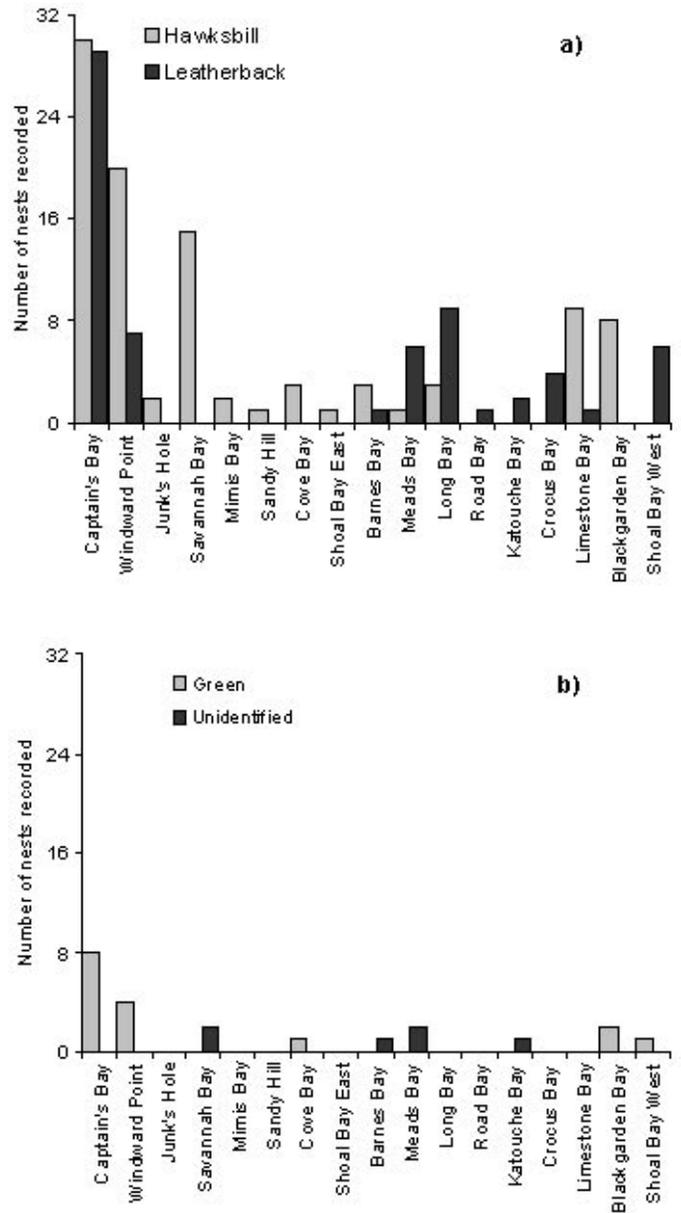
**4.5.1.2. Leatherback turtles**

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.

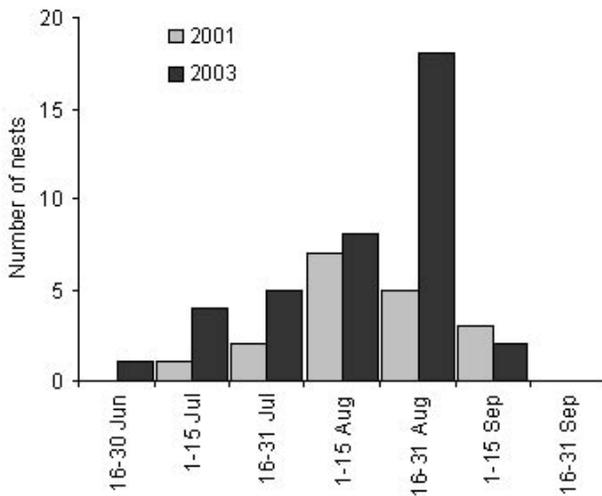


**Photo 4.2.** Leatherback turtle nesting on Maundays Bay, May 2004 (Photo P. Richardson).



**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 5<sup>th</sup> April. During the first TCOT field trip to Anguilla in 2002, TCOT staff recorded a fresh leatherback nest on Captain’s Bay on the 15<sup>th</sup> 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

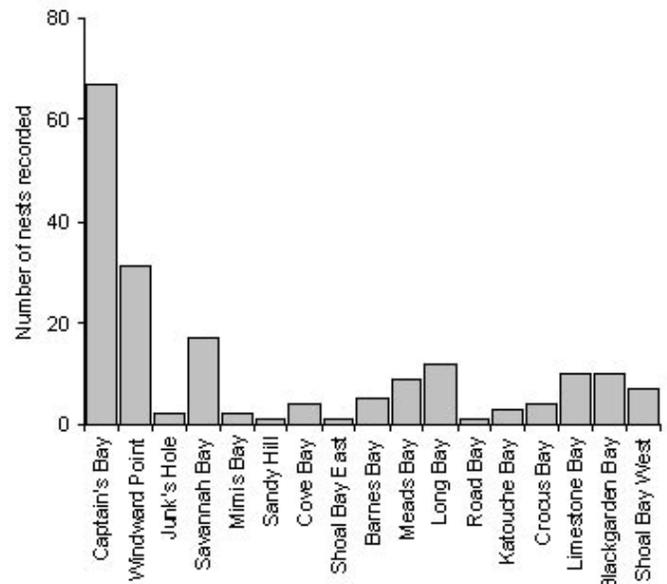
Table 4.2 suggests that there are very low numbers of green turtle nests on Anguilla. Nesting appears to be limited to August and September. These nests were laid in later stages of the regional nesting season, which occurs from about May to November, generally peaking in July and August (Hirth 1997). 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 4.5.** Limestone Bay being developed, May 2004 (Photo P. Richardson).



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



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

on the 15<sup>th</sup> 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><b>In the last 5 years...</b></i>					
	<b>Increasing</b>	<b>Decreasing</b>	<b>Same</b>	<b>Don't know</b>	<b>NR</b>
<b>Green</b>	5	1	2	3	1
<b>Leatherback</b>	4	0	2	3	1
<b>Loggerhead</b>	0	0	0	3	1
<b>Hawksbill</b>	4	1	2	3	1
<b>General</b>	16	4	3	5	1

<i><b>Since you can remember...</b></i>					
	<b>Increasing</b>	<b>Decreasing</b>	<b>Same</b>	<b>Don't know</b>	<b>NR</b>
<b>Green</b>	1	4	1	4	1
<b>Leatherback</b>	0	3	3	3	1
<b>Loggerhead</b>	0	0	0	6	1
<b>Hawksbill</b>	1	6	1	2	1
<b>General</b>	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](http://www.gov.ai/statistics)). There was a period of rapid construction and development that has slowed somewhat in recent years ([www.anguillahomepage.ai](http://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)								
<i>Moratorium</i> (18)	<i>No take of eggs and females</i> (4)		<i>Increased awareness</i> (2)	<i>Research presence on beaches</i> (2)	<i>Regional conservation initiatives</i> (1)			
Reasons cited for decrease in turtle nesting (n= 26)								
Harvest (18)				Development & related issues (15)				
<i>Fishing</i> (11)	<i>Nesting females</i> (3)	<i>Eggs</i> (3)	<i>Smuggling</i> (1)	<i>Development general</i> (7)	<i>Beach use</i> (3)	<i>Beach lighting</i> (3)	<i>Boat traffic</i> (1)	<i>Habitat destruction</i> (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 1<sup>st</sup> of April to the 30<sup>th</sup> 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: <sup>1</sup>Anguillita, <sup>2</sup>Osterdiep Wreck, <sup>3</sup>Sandy Deep, <sup>4</sup>Ooster Reef, <sup>5</sup>Cathley House, <sup>6</sup>Ida Maria, <sup>7</sup>Junk 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	
<b>TOTAL CAPTURE FOR ALL SPECIES: 72</b>				

**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
<b>Green</b>	24	0	0	0	1
<b>Leatherback</b>	2	0	3	14	1
<b>Loggerhead</b>	1	0	1	13	1
<b>Hawksbill</b>	22	0	1	0	1
<b>General</b>	26	3	0	1	1

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

<b>Reasons cited for increase in the number of turtles in Anguillian waters (n=47)</b>					
Moratorium (42)	Turtles tamer (7)	Cultural change (3)	Regional conservation initiatives (3)	Increased awareness (2)	No recent hurricanes (1)
<b>Reasons cited for decrease in the number of turtles in Anguillian waters (n=40)</b>					
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 15<sup>th</sup> 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 15<sup>th</sup> 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 1<sup>st</sup> of October and the 31<sup>st</sup> 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.*

<b>a There should be regulations for which species of turtle can be caught</b>					
	yes	no opinion	no	na	no answer
n	13	4	6	4	1
%	46	14	21	14	4
<b>b There should be regulations for the type of fishing gear and methods that can be used to catch turtles</b>					
	yes	no opinion	no	na	no answer
n	19	2	2	4	1
%	54	6	30	14	4
<b>c There should be regulations for the number of turtles that can be caught</b>					
	yes	no opinion	no	na	no answer
n	8	1	10	8	1
%	29	4	36	29	4
<b>d There should be size limits for turtles caught</b>					
	yes	no opinion	no	na	no answer
n	23	0	0	4	1
%	82	0	0	14	4
<b>e Open and closed zones should be set for turtle fishing</b>					
	yes	no opinion	no	na	no answer
n	9	3	9	6	1
%	32	11	32	21	4
<b>f Open and closed seasons should be set for turtle fishing</b>					
	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 1<sup>st</sup> of April to the 30<sup>th</sup> 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). WIDECAS 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' (WIDECAS 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
<b>By life stage</b>				
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	?	-	-
<b>By product</b>				
<b>Meat</b>				
Fishers who sell meat	28	0	-	-
Meat vendors	9	0	-	-
Meat consumers	62	1	8	1
<b>Eggs</b>				
Collectors who sell eggs	0	0	-	-
Egg vendors consumers	0	0	-	-
Egg consumers	33	0	37	2
<b>Non-edible</b>				
Fishers who sell shells	11( <i>whole shells</i> ) 11( <i>scutes</i> )	0	-	-
Shell vendors	3( <i>whole shells</i> ) 1( <i>scutes</i> )	0	-	-
Shell consumers	34( <i>whole shells</i> ) 17( <i>scutes</i> )	0	35( <i>whole shells</i> ) 51( <i>scutes</i> )	-
<b>Measures of indirect exploitation</b>				
Turtles indirectly used in business	6 advertising	12 attraction	9 feature of professional activities	
<b>Total interviews</b>	<b>72</b>			

**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

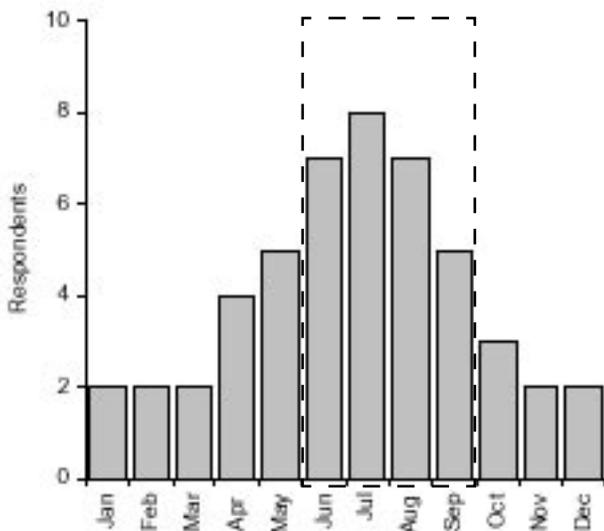
that the use of turtle eggs decreased in line with the decline of the nesting population rather than as a result of legislation, but egg consumption continued into the 1990s.

#### 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. WIDECAS estimated that approximately 20 full and part-time fishers were harvesting turtles prior to 1995 (WIDECAS 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).

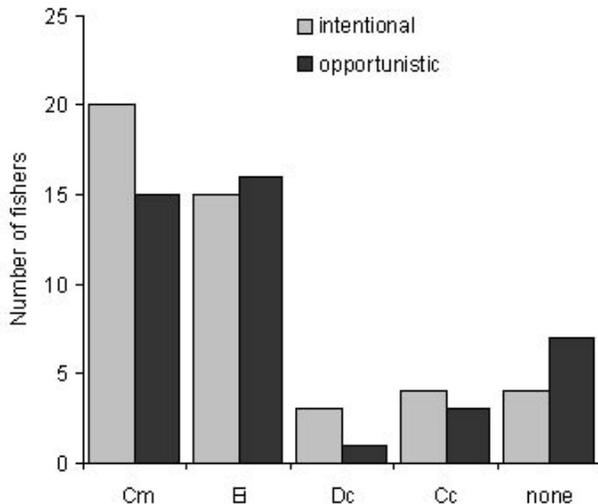
**Butchered turtles:** Twenty (71%) of the turtle fishers interviewed reported that they butchered turtles and sold the meat. They reported a total annual sale of 3,222 turtles (median (IQ range) = 24 (10.5 –202.5)). Once again, the data suggest that there were a small number of individuals with a high 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)
<b>Whole turtles</b>	9	1,801 turtles	1,637	36	128
<b>Butchered turtles</b>	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 backyard 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.*

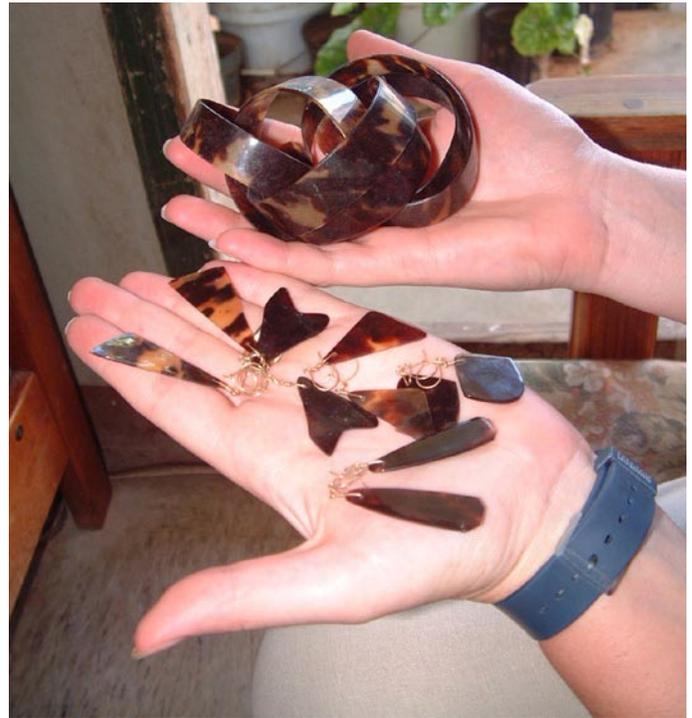
#### 4.7.7. Incidental catch in marine fisheries

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). Anguillan 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 Anguillan 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](http://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.

<b>Advertising</b>	<b>Attraction</b>	<b>Professional</b>
<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

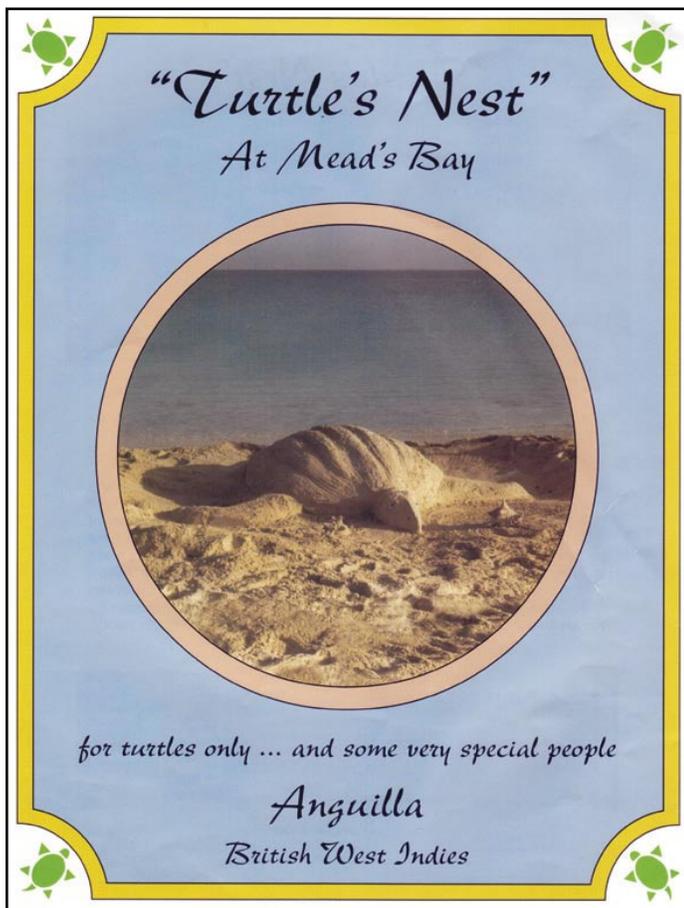


**Photo 4.26.** Anguillian stamps featuring marine turtles.

- 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).



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

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

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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