Seychelles

GENERAL INFORMATION

Agency or institution primarily responsible for the preparation of this report:

Conservation Section
Department of Environment
Ministry of Environment Natural Resources and Transport (MENRT)

Other agencies, institutions, or NGOs that have provided input:

Government agencies: Ministry of Foreign Affairs, Seychelles Fishing Authority(SFA), Policy Planning and Services Division (MENRT), Solid Waste and Cleaning Agency (MENRT), Pollution Control and Environmental Impact Division (MENRT)

NGOs: Wildlife Clubs of Seychelles (WCS); Marine Conservation Society of Seychelles (MCSS); Island Conservation Society (ICS), Seychelles Island Foundation (SIF), Nature Seychelles, Turtle Action Group of Seychelles (TAGS), Nature Protection Trust of Seychelles (NPTS).

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OBJECTIVE I. REDUCE DIRECT AND INDIRECT CAUSES OF MARINE TURTLE MORTALITY

1.1 Introduction to marine turtle populations and habitats, challenges and conservation efforts. [INF]

Two turtle species, the Green and Hawksbill turtles, nest in the Seychelles (Salm 1967). The Seychelles is, globally, one of the five most important Hawksbill rookeries (Mortimer 2000a). The presence of Loggerheads was noted in the past by Frazier (1971), and more recently two injured/dead Olive ridley turtles were recorded for the first time in the Seychelles (Remie and Mortimer 2007). Small numbers of Leatherback turtles are reportedly sometimes caught by longliners operating in the Seychelles (Salm 1967; Domingue and Mortimer 2001).

From 1770, with settlement of the Seychelles islands, until the late 20th century, marine turtles were an important part of the local economy (Mortimer and Collie 1998). Raw Hawksbill shells and dried Green turtle calipee were exported to Europe, and more recently to Japan; while Green turtle meat was utilised as a staple by the local people (Mortimer 1998aa). During this time turtle populations declined drastically.

In 1989 the Seychelles Government developed a National Environmental Management Plan, followed by implementation of the Hawksbill Artisan Compensation and Retraining Programme in 1993, whereby turtle artisans

agreed to sell raw turtle shells to the Government and give up their turtle shell businesses in turn for compensation by the Government (Mortimer 2000b). In 1994, after turtle artisans had been assisted in finding alternative employment, the Government passed a law providing complete legal protection to turtles and banning all commercial trade in turtle products (Ministry of Foreign Affairs 1994; Mortimer and Balazs 2000). While trade in turtle products within the Seychelles has ceased, illegal exports might still exist (Mortimer 2005a). Poaching for local use/consumption was also reported to be a problem as recently as 2003, particularly on remote - islands, (Mortimer et al. 2003).

Conservation efforts appear to be paying off, with nesting populations showing increases in some areas (Mortimer and Bresson 1994; Mortimer and Balazs 2000; Mortimer 2005a). However, the number of (immature) foraging turtles appeared to be declining a decade ago (Mortimer 1999). Effective protection and public awareness campaigns have been crucial factors in the successful management of marine turtles in the Seychelles. More than 20 turtle conservation and monitoring programmes are operating throughout the Seychelles and new ones are being planned, especially for the outer islands. As new ecotourism projects are developed poaching is reduced, but threats to the habitat are increased. Unregulated coastal development has been identified as an important threat to turtles (Mortimer et al. 2003).

Non-fisheries-related threats include coastal erosion and coral degradation/bleaching, as a result of climate change (Mortimer 2005a). Introduced predators such feral cats, pigs and dogs are also important threats to turtles and their nests on some of the Southern Islands (Seabrook 1987; Mortimer 1984; Mortimer et al. 2003).

Turtles nest and forage in the vicinity of virtually every island in Seychelles. Seychelles comprises three main groups of islands:

1. Inner Islands (mostly granitic islands) include the islands of Cousin, Cousine, Silhouette, Mahe, La Hague, Praslin, Aride, Bird, Denis, Felicite and Fregate); 99% of the human population resides on Mahe, La Hague and Praslin (Mortimer and Collie 1998). The Granitic islands are significant nesting sites for Hawksbill turtles and, to a lesser extent, Green turtles, and also foraging habitats (Salm 1976; Garnett and Frazier 1979; Frazier 1984; Mortimer 1984; Mortimer and Bresson 1994; Hitchins et al. 2003). Green turtles used to frequent the waters of these islands in large numbers, but their numbers have since decreased drastically due to overexploitation (Honegger 1967).

Threats include poaching and rapid coastal development, but several well protected populations occur -- including those at Aride, Bird, Cousin, Cousine, Curieuse MP, Ile Anonyme, Denis, Ste. Anne Marine Park (Mortimer and Bresson 1994). Significant public awareness, sensitization, and ecotourism programmes are underway at many of the inner islands.

2. The Amirantes Group, along with Platte and Coetivy islands comprise sand cays where significant Hawksbill and some Green turtle nesting occur, along with extensive foraging habitat for both species. While some atolls (i.e., Alphonse/St. Francois, and D'Arros/St. Joseph) are well protected, poaching still occurs elsewhere, especially at uninhabited islands.

3. The Southern Islands mostly comprise upraised limestone reefs and host the largest nesting populations of green turtles in Seychelles -- including the Aldabra Atoll World Heritage Site (Mortimer et al. 2006). While Aldabra is well protected and the site of long term nesting and in-water monitoring programmes (Mortimer 1998aa; Mortimer et al. 2006), a number of the outer islands suffer from poaching. Green turtles, Hawksbills and the occasional Loggerhead forage in shallow waters adjacent to these islands.

1.2.1 Describe any protocol or approaches practiced in your country, which you consider exemplary, for minimising threats to marine turtle populations and their habitats, which may be suitable for adaptation and adoption elsewhere. [BPR]

1. More than 20 turtle conservation and monitoring programmes occur throughout the Seychelles under the management of a wide variety of organisations including: Government, parastatal organisations, NGOs, private businesses, owners and lease holders of private islands, hotels, etc. In 2003 the BHC/MCSS Strategic Management of Turtles in Seychelles project brought most of these stakeholders together in a loose network for the purpose of data sharing and production of a turtle conservation strategy. In December 2007, the network was legally registered as an independent association called Turtle Action Group of Seychelles (TAGS).

2. The Ministry of Environment is moving its focus towards development of national policy leaving the private sector (including parastatals, NGOs, private business, etc.) implement activities on the ground.

3. The Ministry of Environment coordinates a turtle monitoring and stranding network through its "Green Line" 24hr-environmental hotline which enables members of the community to report incidents, and request information. Inputs and responses are followed up weekly by the Minister of Environment.

4. Legislation with strong penalties to deter killing of turtles and their eggs. (Wild Animals and Birds Protection Act,

Amendment of 2001).

5. The Department of Environment encourages coastal rehabilitation especially at turtle nesting sites. Several such activities have taken place jointly with other NGOs and the private sector respectively. In addition to that, recommendations or comments made for any new hotel development takes into account turtle nesting sites.

6. The National Beach Monitoring Programme is one of the most important coastal management tools which is being used by the Department of Environment and other NGOs such as MCSS. The data collected helps to make better predictions and comparisons for particular beaches. It is an important tool for turtle monitoring as it helps to understand the behaviour of beaches during specific seasons of the year.

1.3.1 Describe any socio-economic studies or activities that have been conducted among communities that interact with marine turtles and their habitats. [BPR, INF]

1. Surveys conducted prior to implementing the Artisan Compensation and Reinstallation Programme - in 1993-94. This programme, funded by the GEF and the Seychelles Government, was an effort to stop the domestic trade in and export of hawksbill shell whilst minimising hardship to local artisans who depended on crafting and sale of hawksbill shell products.

2. Surveys conducted during 2001-02 nesting season to evaluate public attitudes to turtles & turtle conservation among coastal residents of South Mahe (part of the GEF: Seychelles Marine Ecosystem Management Programme (Mortimer 2004). (see Annex 2: Aish 2002).

3. A study was carried out to evaluate the socio-economic importance of marine and coastal resources (including turtles) to local communities. This programme, funded by the GEF and the Seychelles Government, was part of the GEF SEYMEMP project.

1.3.2 Which of these adverse economic incentives are underlying threats to marine turtles in your country? [TSH]

☐ High prices earned from turtle products relative to other commodities

☐ Lack of affordable alternatives to turtle products

■ **Ease of access to the turtle resource (eg. by virtue of proximity or ease of land / water access)**

☐ Low cost of land near nesting beaches

■ **Low penalties against illegal harvesting**

■ Other1: The black market offers an economic incentive for people to poach turtles

■ Other2: Large scale coastal tourism development underway throughout the country

☐ Other3:

☐ None of the above or Not Applicable

Many fishermen and coastal residents have ready access to turtles and can poach if motivated to do so, especially at uninhabited islands.

Mortimer et al. (2003) suggested stronger penalties would help curb the problem of poaching; penalties under the Wild Animals and Birds Protection (Amendment) Act, 2001 have already been increased to some extent.

1.3.3 Has your country has taken any measures to try to correct these adverse economic incentives? [BPR]

■ YES ☐ NO ☐ NOT APPLICABLE (no adverse economic incentives exist)

1. Turtle tourism programmes are currently being developed in collaboration with hotels.

2. Ministry of Environment and Natural Resources (MENR) is showing strong interest in court cases that are pending, and also in making additional arrests and prosecution.

3. Some of the new coastal developments incorporate Conservation Trust Funds to address environmental problems,

including those associated with turtles.

1.4.1 Indicate, and describe in more detail, the main fisheries occurring in the waters of your country, as well as any high seas fisheries in which flag vessels of your country participate, that could possibly interact with marine turtles. [INF]

a) Shrimp trawls: ☐ YES ■ NO

Trawling is not done in Seychelles (Domingue and Mortimer 2001), but this fishing gear affects "Seychelles" turtles in the Mozambique Channel. However, no data are currently available on the extent of interactions.

b) Set gill nets: ■ YES ☐ NO

Gill/Drift nets are among the gear known to be problematic for turtles in Seychelles waters. Fishing for sharks with nets (ie drift nets) is banned (Fisheries Amendment regulation S.I. 5 of 1998). However, enforcement is still a problem.

c) Anchored Fish Aggregating Devices (FADs): ☐ YES ■ NO

There are no anchored FADs at present. Trials were done in 2004-2005 with FADs designed so that they would not catch turtles (strap bands were used instead of a net under the float)

d) Purse seine (with or without FADs): ■ YES ☐ NO

Purse seining for tuna occurs in Seychelles' EEZ and on the high seas, and a lot of the catch is around drifting FADs. Data on turtle by-catch is not available, but there are some reports of purse seining being responsible for the incidental capture of large numbers of juvenile Hawksbills (Mortimer 1998a; Domingue and Mortimer 2001).

e) Longline (shallow or deepset): ■ YES ☐ NO

Large scale and semi-industrial longliners operate in Seychelles' EEZ and on the high seas. Turtle by-catch does not seem to be a problem with the local semi-industrial fleet. Data on by-catch is not available from the large-scale longliners, which usually do not tranship in Seychelles. Leatherbacks have been landed occasionally by tuna longliners, although most of these turtles were reportedly released alive (Mortimer 1998a; Domingue and Mortimer 2001). In addition, the switch to circle hooks has been successful in mitigating the few cases of by-catch previously reported. However, turtle by-catch might have been underestimated by these reports.

f) Driftnet: ☐ YES ■ NO

The use of drift nets (shark nets) is banned in Seychelles waters (Mortimer 1998a). Yet dormant gillnets associated with artisanal fishing could be a significant fisheries-related threat to marine turtles in the Seychelles (Domingue and Mortimer 2001). While appropriate legislation is in place, more effective enforcement is required (Mortimer et al. 2003).

g) Other1:

Hawksbill turtles are often caught by baited fishing lines by artisanal fisherman (Mortimer 1998b; Mortimer 2005a).

h) Other2:

Injury or mortality caused by boat strikes has been identified as a prevalent threat in the Seychelles (Mortimer et al. 2003).

☐ **None of the above**

1.4.2 Please indicate the relative level of fishing effort and perceived impact of each of the above fisheries on marine turtles (e.g. in terms of by-catch). [TSH]

a) Shrimp trawls

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ■ **NONE** ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ■ **NONE** ☐ UNKNOWN

Source: Demersal trawling is banned in Seychelles (Fisheries Act). However, trawling outside Seychelles EEZ, for example in the Mozambique Channel is likely to negatively impact turtle populations of Seychelles during their regional migrations.

Source: Seychelles Fishing Authority (SFA)

b) Set gill nets

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ■ **RELATIVELY LOW** ☐ NONE ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ■ **RELATIVELY LOW** ☐ NONE ☐ UNKNOWN

Source: Source: Seychelles Fishing Authority (SFA)

c) Anchored Fish Aggregating Devices (FADs)

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ■ **NONE** ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ■ **NONE** ☐ UNKNOWN

Source: There are no anchored FADs in Seychelles at present.

Source: Seychelles Fishing Authority(SFA)

d) Purse seine (with or without FADs)

Fishing effort:

■ **RELATIVELY HIGH** ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ■ **RELATIVELY LOW** ☐ NONE ☐ UNKNOWN

Source: Data from observer programmes on French and Spanish purse seiners will soon be available to assess the impact of this fishery on turtle by-catch.

Source: Seychelles Fishing Authority (SFA)

e) Longline (shallow or deepset)

Fishing effort:

■ **RELATIVELY HIGH** ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ■ **UNKNOWN**

Source: Longline fishing may be having a significant impact on leatherback turtles.

Source: Seychelles Fishing Authority (SFA)

f) Driftnet

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ■ **NONE** ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ■ **UNKNOWN**

Source: Banned in Seychelles, but better enforcement is necessary (Mortimer et al. 2003).

g) Other1 (from 1.4.1):

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Source:

h) Other2 (from 1.4.1):

Fishing effort:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Perceived Impact:

☐ RELATIVELY HIGH ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Source:

1.4.3 Describe any illegal fishing that is known to occur in or around the waters of your country that may impact marine turtles. Describe the measures being taken to deal with this problem and any difficulties encountered in this regard. [TSH]

There are known incidents of illegal fishing of turtles at sea using some sort of harpoon, but nobody is ever caught in the act, so it is not possible to prosecute offenders. Most poaching incidents take place on nesting beaches. A few offenders have been arrested and prosecuted; there is however, an institutional gap to fully address those poaching incidents.

1.4.4 Which of the following methods are used by your country to minimise incidental capture/mortality of marine turtles in fishing activities? [IND]

a) **Appropriate handling** of incidentally caught turtles (e.g. resuscitation or release by fishers using equipment such as de-hooking, line cutting tools and scoop nets)

☐ YES ■ **NO** ☐ NOT APPLICABLE

b) **Devices that allow the escape of marine turtles** (e.g. turtle excluder devices (TEDs) or other measures that are comparable in effectiveness)

☐ YES ■ **NO** ☐ NOT APPLICABLE

c) **Measures to avoid encirclement** of marine turtles in purse seine fisheries

■ **YES** ☐ NO ☐ NOT APPLICABLE

d) **Appropriate combinations** of hook design, type of bait, depth, gear specifications and fishing practices

■ **YES** ☐ NO ☐ NOT APPLICABLE

Many local longliners are now using circular hooks instead of J-hooks, citing better CPUEs as the reason for the change.

e) **Monitoring and recovery of fish aggregating devices** (FADs)

☐ YES ■ **NO** ☐ NOT APPLICABLE

f) **Net retention and recycling schemes**

☐ YES ■ **NO** ☐ NOT APPLICABLE

g) **Spatial and temporal control of fishing** (e.g. seasonal closures of fishing activities)

☐ YES ■ **NO** ☐ NOT APPLICABLE

h) **Effort management control**

☐ YES ■ **NO** ☐ NOT APPLICABLE

☐ Other (list and explain):

☐ None of the above

1.4.5 Which of the following programmes has your country developed - in consultation with the fishing industry and fisheries management organisations - to promote implementation of measures to minimise incidental capture and mortality of turtles in national waters and in the high seas? [IND]

Onboard observer programmes

■ **YES** ☐ NO ☐ NOT APPLICABLE

An observer programme for the Seychelles-flagged purse seiners was established in 2008, will be fully operational in 2009.

Vessel monitoring systems

■ **YES** ☐ NO ☐ NOT APPLICABLE

Inspections (i.e. at sea, in port, at landing sites)

■ **YES** ☐ NO ☐ NOT APPLICABLE

Garbage: Ship-generated garbage is collected at the ports by licensed waste collection contractors (private companies) and stored in skips belonging to STAR (waste management agency) at the port. This is emptied regularly (almost daily) by STAR and dumped at the Providence Landfill waste dump site. Waste from yachts is collected by STAR whenever they enter the port. Contacts are made through local yacht charter agencies.

Private operators collect garbage and by-catch from fishing fleets.

Waste oil: Containers are made available by STAR on the port and waste oil is collected from ships stored in these containers. This is then sent to be treated at Reunion Island (France).

Fish scrap: This is collected from ships by the licensed contractors and bought by IOT (Indian Ocean Tuna Company) for production of animals feed.

Waste collection at the ports is monitored on site by SWAC Agency (Solid Waste And Cleaning) and the Pollution Control Section, both of which are within the Ministry of Environment and Natural Resources.

Training programmes / workshops to educate fishers

☐ YES ■ **NO** ☐ NOT APPLICABLE

Informative videos, brochures, printed guidelines etc.

☐ YES ■ **NO** ☐ NOT APPLICABLE

Other (list and explain): Banning of set gill nets

■ **YES** ☐ NO ☐ NOT APPLICABLE

Mortality due to fishing activities is reported to be low and therefore is probably not a high cause of concern. The SFA and the MENR are in constant contact to discuss any emerging issues. Verbal reporting is encouraged but is incomplete.

Set nets have been banned in Seychelles coastal waters, largely to minimize the possibility of turtle capture. When set nets / shark nets were banned this was done at the expiration of the licenses and so no compensation payment was paid - also the nets were not retained.

☐ **None of the above**

1.4.6 Are the mitigation measures described in 1.4.4 and 1.4.5, periodically reviewed and evaluated for their efficacy? [SAP]

■ **YES** ☐ NO ☐ UNSURE

The trial with circular hooks was evaluated in 2004, was proven successful, fishers are now advised to switch to the circular hooks.

1.4.7 In your country, what types of data collection, research and development have been undertaken to support the reduction of marine turtle incidental catch (while taking into consideration the impact of various mitigation measures on other species)? [SAP]

None in the last year except development of observer programme for Seychelles-flagged purse seiners. Circle hooks continue to be used by longline fleet but are not subjected to specific legislation or reasearch at present.

The purse seine fleet (French and Spanish) has started modifying the design of their drifting FADs to reduce the number of turtles getting caught on the floating parts (usually a bamboo raft covered with netting). A new design with a submerged float is replacing some of the floating rafts.

1.4.8 Has your country exchanged information and provided technical assistance (formally or informally) to other Signatory States to promote the activities described in 1.4.4, 1.4.5 and 1.4.7 above? [SAP]

☐ YES ■ **NO** ☐ UNSURE

1.4.9 What legislative and practical measures has your country taken in support of UN General Assembly Resolution 46/215 concerning the moratorium on the use of large-scale driftnets? [SAP]

Seychelles has traditionally supported the content and spirit of the resolution. Large-scale drift nets are prohibited in Seychelles waters (by the Fisheries Act).

1.5.1 Does your country have legislation to prohibit direct harvest and domestic trade in marine turtles, their eggs, parts and products; and to protect important turtle habitats? [IND]

■ **YES** ☐ NO ☐ UNSURE

Under the Wild Animals and Birds Protection Act, of which the Wild Animals (Turtles) Regulations enacted in 1994 completely banned all disturbances, harvest, sale, possession of turtles, turtle products or eggs.

The Wild Animals (Turtles) Protection (Amendment) Regulations 1998 made it illegal for anyone to possess raw hawksbill shell, thus invalidating permits granted in 1994 that had allowed possession of stockpiles of raw shell that were declared to the government in 1994. This new regulation closed loopholes that facilitated illegal trade in hawksbill shell between local suppliers and foreign importers.

The Wild Animals and Birds Protection (Amendment) Act, 2001 increased penalties for offences. Prison time was doubled (from one year to two years); and maximum fines were increased by 500 times (from Rs1000 to Rs 500,000). Provisions for confiscation of vessels, vehicles, aircraft, and gear was also enabled.

1.5.2 Which, among the following list, are economic uses and cultural values of marine turtles in your country? Please rate the relative prevalence / importance of each consumptive or non-consumptive use. [INF]

USES / VALUES	**RELATIVE PREVALENCE / IMPORTANCE**
Meat consumption	
■ **YES** ☐ NO	☐ HIGH ■ **MODERATE** ☐ LOW ☐ UNKNOWN

Meat consumption (now illegal, but some poaching occurs) Traditionally, green turtles have been harvested for meat and sold on the local market. Green turtle calipee was exported in large quantities to Europe prior to 1968. An alarming trend of switching to Hawsbill meat consumption was reported in 1998 (Mortimer and Collie 1998).

Egg consumption

■ **YES** ☐ NO ☐ HIGH ☐ MODERATE ■ **LOW** ☐ UNKNOWN

Egg consumption is minor.

Shell products

■ **YES** ☐ NO ■ **HIGH** ☐ MODERATE ☐ LOW ☐ UNKNOWN

Historically (1700s to 1994) important revenues were provided by export of raw shell from hawksbill turtles (Hirth and Carr 1970; Mortimer and Collie 1998; Mortimer 2000). Local curio industry also worked the carapaces into bracelets and various types of ornaments (picture frames, butterflies etc) for local sale to tourists. Large numbers of hawksbill turtles were stuffed and sold to tourists and local residents as wall hangings. A few cases of attempted international trade have however been reported since enactment of legislation in 1994. Currently, virtually all domestic trade in hawksbill has ceased.

Fat consumption

■ **YES** ☐ NO ☐ HIGH ☐ MODERATE ■ **LOW** ☐ UNKNOWN

Historically, fat was burned into oil and drank as medicine.

Traditional medicine

■ **YES** ☐ NO ☐ HIGH ☐ MODERATE ■ **LOW** ☐ UNKNOWN

According to tradition people diagnosed with tuberculosis were sent to outer islands where they drank turtles blood for cure.

Eco-tourism programmes

■ **YES** ☐ NO ■ **HIGH** ☐ MODERATE ☐ LOW ☐ UNKNOWN

Eco-tourism programmes centred on marine turtles (on Private islands and nature reserves, sea turtles are amongst the tourist attractions e.g. at Aldabra, Aride, Bird, Cousin, Cousine, Denis). Elsewhere on beaches adjacent to hotels turtles feature as a tourist attraction (e.g. Banyan Tree (Mahe), Lemuria (Praslin), Anse Forban Chalets (Mahe)). Turtles are regularly encountered and are used as an incentive to encourage snorkelers and SCUBA Divers. Yacht charter companies organize trips for tourists to see and feed sea turtles around the islands of Grand Soeur, Felicite, and Ile Coco.) In general, turtles are considered to be among the natural assets that Seychelles has to offer tourists who visit the country.

Cultural / traditional significance

■ **YES** ☐ NO ■ **HIGH** ☐ MODERATE ☐ LOW ☐ UNKNOWN

Marine turtles are culturally/traditionally significant. Seychellois value marine turtles as a symbol of their culture (Mortimer and Collie 1998). For decades, they have featured as a symbol of the Central Bank of Seychelles, on bank notes, coins, on postage stamps, etc.)

Other

1.5.3 Please indicate the relative level and impact of traditional harvest on marine turtles and their eggs. [IND, TSH]

Level of harvest:

■ **RELATIVELY HIGH** ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Impact of harvest:

■ **RELATIVELY HIGH** ☐ MODERATE ☐ RELATIVELY LOW ☐ NONE ☐ UNKNOWN

Source of information:

1.5.4 Have any domestic management programmes been established to limit the levels of intentional harvest? [SAP]

■ **YES** ☐ NO ☐ UNKNOWN

The history of turtle legislation in Seychelles provides a very interesting case study and perhaps an example for other countries. Over the years, various types of management programmes have been implemented that include limits on levels of intentional harvest.

In the end, however, the Seychelles authorities decided there was a need to provide complete legal protection of all sea turtles through the Wild Animals (Turtles) Regulations (1994).

The history of previous legislation is described below:
The Turtle Act of 1925 set minimum size limits (hawksbill of not less than 24 inches in length and green turtles of not less than 30 inches were allowed to be taken), laid down ownership rights to turtles coming to land, provided for the manner in which they could be treated, and banned certain capture techniques. In 1962, a law (S.I. No. 29 of 1962) was passed protecting all female hawksbills. But, it was repealed exactly two months later (S.I. No. 42 of 1962) in response to protests from shell traders and artisans. The shell of females tends to be thicker than that of the males and thus more appropriate for the manufacture of worked tortoiseshell articles. The same law (S.I. No. 29 of 1962) made it illegal to kill female Green turtles on some islands and established a closed season for their slaughter on others. At Aldabra the closed season was of four months duration from December to March.

In 1968, nature reserves were established at: Aldabra (managed by Royal Society); Cousin (managed by International Council for Bird Preservations (ICBP)); Aride (managed by Royal Society for Nature Protection (RSNP)). In 1976, The Green Turtles Protection Regulations, 1976 (S.I. No. 43 of 1976 of THE TURTLES ORDINANCE (Chapter 141)) was passed protecting females and prohibiting the take of male green turtles during the months of November though February. They also prohibited export of Green turtle products or their sale in restaurants. In 1977, The Green Turtles Protection (Amendment) Regulations, 1977 (S.I. No. 51 of 1977 of THE TURTLES ACT (Chapter 141)) was passed making it necessary to have a butcher's license to sell Green turtle meat and making it illegal to sell more than 2 kg of meat to any customer, and for anyone to possess more than 2 kg of either dry or salted turtle meat.

In 1977, The Hawksbill Turtle (Protection) Regulations, 1977 (S.I. No. 95 of 1977 of THE TURTLES ACT (Chapter 141)) made it illegal for any person to buy or sell stuffed Hawksbill turtles. Existing stocks of stuffed turtles were recorded and no further permits were to be issued upon exhaustion of the stocks. In 1978, The Hawksbill Turtles (Protection) (Amendment) Regulations, 1978 (S.I. No. 106 of 1978 of THE TURTLES ACT (Chapter 141)) made it illegal to kill female turtles in scheduled areas that included Aride, Cousin, Cousine, Curieuse, and South East Island. In 1979, Turtles (Protection) Regulations, 1979 (S.I. No. 115 of 1979 of THE TURTLES ACT (Chapter 141)) made it illegal to kill any turtles in demarcated areas. These areas, which included Aride, Cousin, Cousine, Curieuse, and South East Island, were extended to also include the islands that now comprise the Ste. Anne Marine Park (Ste. Anne, Moyenne, Round, Cerf, Long, and Cache), and Aldabra Atoll and its lagoon.

In 1981, policy made the parastatal company, Seycom the sole exporter of raw Hawksbill shell. It had been suggested that Seycom could discourage people from killing Hawksbills by offering them a low price for shell. Capture statistics indicate otherwise (Mortimer, 1984).

In 1989 the Seychelles Government developed a National Environmental Management Plan, followed by the implementation of the Hawksbill Artisan Compensation and Retraining Programme in 1993, whereby turtle artisans agreed to sell raw turtle shells to the Government and give up their turtle shell businesses in turn for compensation by the Government (Mortimer 2000b). In 1994, after turtle artisans had been assisted in finding alternative employment, the Government passed the Wild Animals (Turtles) Protection Regulations of the Wild Animals and Birds Protection Act, providing complete legal protection to turtles and banning all commercial trade in turtle products (Ministry of Foreign Affairs 1994; Mortimer and Balazs 2000). While trade in turtle products within the Seychelles has ceased, illegal exports might still exist (Mortimer 2005a). Poaching for local use/consumption was also reported to be a problem as recently as

2003, particularly on remote islands, (Mortimer et al. 2003).

Regarding the Effectiveness of these Programmes:
The most effective programmes have been the establishment of protected areas where turtles could not be hunted. On the other hand "selective" legislation that prohibited capture of females, or mandated seasonal restrictions, or provided preferential protection to one species or another were relatively ineffective. This is because it was usually impossible to provide definitive evidence in regard to those restrictions that could be upheld in court.

1.5.5 Describe any management agreements negotiated between your country and other States in relation to sustainable levels of traditional harvest, to ensure that such harvest does not undermine conservation efforts. [BPR]

None so far. But, Seychelles would like to use this IOSEA MoU as the starting platform.

1.6.1 First, select one of the options at left to indicate whether or not your country has any of the following measures in place to minimise the mortality of eggs, hatchlings and nesting females. If yes, then estimate the relative effectiveness of these measures. [IND, SAP]

MEASURES	RELATIVE EFFECTIVENESS
Monitoring / protection programmes	
■ **YES** ☐ NO ☐ N/A	☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

The Wild Animals and Birds Protection Act of which The Wild Animals (Turtles) Protection Regulations (1994) make it illegal to disturb, injure, catch, fish for, kill, sell, purchase, receive or possess any turtle, turtle eggs or parts. It is recognised, however, that there is a lack of capacity to properly enforce the law. Monitoring entails a presence that discourages poaching.

Some domesticated and feral animals, particularly dogs, are regarded as a problem to nesting turtles. This is addressed by inserts in the media.

Sand Mining is illegal according to the Sand and Gravel Removal Act.

Coastal rehabiltation programmes aim to protect beaches for nesting turtles and preventing erosion, loss of nests etc. More work needs to be done, however, to educate the public and foreign workers on their behaviour regarding necessity to protect dune vegetation, illegal removal of sand and disturbance of nesting females.

The first protection programmes were initiated as early as 1968 (see also sections 1.1. and 1.5.4.; Mortimer et al. 2006), while monitoring started in the early 1980's on some islands (Mortimer et al. 2003). On many of these islands, nesting turtle populations are increasing. Mortimer (2005a) demonstrated a trend of increasing Hawksbill populations with good protection programmes. The decreasing nesting populations on (human) populated islands (e.g. Mahe), is thought to be the result of coastal development (Mortimer et al. 2003; Mortimer 2005).

Education / awareness programmes	
■ **YES** ☐ NO ☐ N/A	☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Public awareness campaigns during hawksbill nesting season:

Inserts on SBC (Seychelles Broadcasting Corporation) inform people about general threats to turtles, including dogs.

Reporting on national TV, radio, and newspapers about poaching incidents, with commentary from law enforcement and MENR personnel about seriousness of offence.

Distribution of information through the Education, Information, and Communication (EIC) section of MENR. (e.g. seminars, Turtle March, Public Service Awards Presentation/Competition, production of information materials).

Egg relocation / hatcheries

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Egg clutches are relocated where beaches are eroded by tidal waves .

Predator control

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Feral dog eradication campaigns have been conducted in South Mahe with good results.

Vehicle / access restrictions

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN

At several locations protective barriers have been installed so as to prevent vehicles from going on the beaches. The Department is now extending such campaign so that more beaches are protected.

Removal of debris / clean-up

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Re-vegetation of frontal dunes

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

The "My Tree our Seychelles Campaign" which started in 2008 is an excellent example whereby re-vegetation of frontal dunes at several places is taking place.

Coastal rehabilitation projects (conducted by the Forestry Section of the MENR) have been in place since 1995. They involve the planting of coastal indigenous trees near beaches as well as the placement of wooden barriers/posts to prevent access of vehicles on the beach. The main purpose of the re-vegetation projects is to prevent erosion of beaches and to conserve beach dunes.

Projects are being conducted in the following areas:
Mahe:
-- Grand Anse, Mahe since 1995
-- Anse a La Mouche, Mahe : since 1997
-- Elsewhere on Mahe at Val Mer, Port Launay, Cap Ternay, Beau Vallon, Bougainville, and Intendance the MENRT has recently initiated new projects. These projects have proved to be very effective in maintaining beach dunes and regular continuous monitoring is being done to assess effectiveness.
-- Similar projects are underway by various groups at many other sites on the inner islands Seychelles.

Praslin:
-- Anse Kerlan -- Anse Madge -- Cote d - Or -- Anse Lazio

La Digue:
-- Grand Anse (replanting of dune vegetation and barriers to keep off vehicles)

Coastal rehabilitation projects done by other organisations at locations for which they are responsible include: Fregate Island Resort, Fregate; Nature Seychelles at Cousin Island; A. Royale School Wildlife Club at Anse Royale beach.

Building location/design regulations

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Environment Impact Assessment (EIA) Regulations have applied to any development near nesting beaches, since 1996 (Mortimer et al. 2003). However, stricter national regulations (Mortimer et al. 2003), and better follow-up and enforcement is needed particularly with regards to major tourism development. Any development along the coast has to respect the 25 metres setback line. This required distance is important as it acts as a protective measure for the beach in question.

Light pollution reduction

■ **YES** ☐ NO ☐ N/A ☐ EXCELLENT ■ **GOOD** ☐ LOW ☐ UNKNOWN

Advice is given during the planning stage of development projects. New developments on the coast are increasingly taking the issue into account. See Mortimer (2004; Appendix 2) for guidelines on how to reduce the impact of artificial light on turtles.

Other (list and rate them)

☐ YES ☐ NO ☐ N/A

1.6.2 Has your country undertaken any evaluation of its nest and beach management programmes? [SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

Selected references for publications and reports on this topic:

Mortimer, J.A. 1998. Turtle and Tortoise Conservation. Project J1: Environmental Management Plan of the Seychelles. Final report to the Ministry of Environment Republic of Seychelles and the Global Environment Facility (GEF). January 1998. Volume 1 (82 pages) and Volume 2 (Appendices 1-50).

Mortimer, J.A. 2000. Sea turtle conservation programmes: factors determining success or failure. Pp. 327-333 in Salm, R.V., Clark, J.R., and Siirila, E. Marine and Coastal Protected Areas: A guide for planners and managers. IUCN, Washington D.C. xxi+371 pp.

Mortimer, J.A., T. Jupiter, J. Collie, R. Chapman, A. Liljevik, B. Betsy, J. Stevenson, V. Laboudallon, M. Assary, D. Augeri, & S. Pierce. in press. Pp. 00-00. Trends in the Green Turtle (Chelonia mydas) Nesting Population at Aldabra Atoll, Seychelles (WIO) and their Implications for the Region. Proceedings of the 23rd Annual Symposium on Sea Turtle Biology and Conservation, held 17-21 March 2003, Kuala Lumpur, Malaysia.

Mortimer, J.A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP) - Turtle component. Dec 2000 to March 2004: Final report.

More work currently underway:
The National Beach Monitoring programme involves taking beach profile measurements at regular intervals which are compiled in a national database. The programme aims to provide information on the seasonal trends of erosion and accretion of all the beaches in Seychelles to give an overview of the state of the beaches. This is relevant to the turtle nesting activities since many of the beaches in Seychelles provide nesting habitat for turtles. Project executed by Policy Planning and Services (PPS) of MENR.

OBJECTIVE II. PROTECT, CONSERVE AND REHABILITATE MARINE TURTLE HABITATS

2.1.1 What is being done to protect critical habitats *outside* of established protected areas? (NB: It is assumed that legislation relating to established protected areas will have been described in Section 1.5.1) [BPR, SAP]

The Ministry of Environment has initiated the "Environmental Awards Day" whereby private citizens and companies are recognised for efforts that contribute to enhancing the environment. But, awards are not necessarily specific to enhancing turtle habitat.

True incentive programmes need to be developed. Increased efforts by the authorities to curb poaching and to ensure

protection of turtles are producing tangible results in terms of increased turtle numbers at protected sites. This is visible to the general public, and serves as an incentive for people to support conservation programmes.

Coastal areas in granitic islands are monitored by the Environment Engineering Section (MENRT) whereby in degraded areas, coastal rehabilitation is carried out.

2.1.2 Are assessments routinely made of the environmental impact of marine and coastal development on marine turtles and their habitats? [IND, SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

Assessments are made at many beaches, which include but are not specific to, turtles. These record and report any threats to turtles, including habitat destruction, poaching, etc.

Prior to most development projects on the coast or water front, Environmental Impact Assessments evaluate the impact on nesting or foraging turtles. In many cases, turtle specialists are invited to write a detailed report.

2.1.3 Is marine water quality (including marine debris) monitored near turtle habitats? If yes, describe the nature of this monitoring and any remedial measures that may have been taken. [SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

An ongoing program is implemented by the Ministry of Environment and Natural Resources (MENRT) to ensure that water quality is not deteriorating and in cases where this is evident, measures are taken to redress the situation. All sewerage treatment plants need authorization from MENR to discharge effluents into the ambient environment. This authorization is renewed every two years. Prior to issuance, effluent quality tests are carried out by the ministry in accordance to the Effluent Standards. A set of parameters and their expected maximum concentration level in the effluent being disposed are measured (such as pH, temp., BOD, COD, phosphorous, nitrate, etc.). The Pollution Prevention and Control Section (PPC) in collaboration with the Marine Unit from the Conservation Section within the MENR is also in the process of implementing a water quality monitoring program in order to assess the impact of pollution from the land on the surrounding marine and freshwater ecosystems.

2.1.4 Are measures in place to prohibit the use of poisonous chemicals and explosives? [SAP]

■ YES ☐ NO ☐ NOT APPLICABLE

The Fisheries Act prohibits the use of explosives or poisons in Seychelles waters.

The Pesticide Board approves the use of poisonous substances in Seychelles. A member of the MENRT sits on the board to ensure that importation and use of chemicals that may affect the biodiversity is controlled.

2.2.1 Are efforts being made to recover degraded coral reefs? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc). [IND, SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE (no degraded coral reefs)

In response to the severe mass coral-bleaching event in 1998 and El-Nino related water warming events, which caused large-scale coral death in Seychelles, the SEYMEMP project was initiated in late 2000 (see Mortimer et al. 2003). Among its principle objectives has been to survey hard coral cover and associated reef communities at 60 individual reef sites located within the inner granitic islands of Seychelles. This survey documented threats to coral recovery along with site-specific recovery potential under current environmental conditions.

The data collected are being analyzed and interpreted with a view of developing appropriate guidelines for future management actions aimed at promoting the natural recovery potential of previously degraded reef sites. These analyses are of critical importance and will be incorporated in the IMPASP for current and future potential viability and relevance of Marine Protected Areas.

Grazing pressure by black-spined sea urchin has been identified as a major threat to coral recruitment. Small-scale reduction in sea urchin densities in combination with monitoring of local hard coral recruitment has demonstrated that local scale urchin control measures can be used to effectively promote and speed up the recovery of hard coral communities (Wendling et al., unpublished).

Mooring buoys are being placed in areas where coral structure remains. Monitoring has demonstrated that these installations have significantly reduced further coral damage.

2.2.2 Are efforts being made to recover degraded mangrove habitats that are important for turtles? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc.) [IND, SAP]

☐ YES ☐ NO ■ **NOT APPLICABLE** (no mangrove habitats important for turtles)

2.2.3 Are efforts being made to recover degraded sea grass habitats? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc.). [IND, SAP]

☐ YES ■ **NO** ☐ NOT APPLICABLE (no degraded sea grass habitats)

OBJECTIVE III. IMPROVE UNDERSTANDING OF MARINE TURTLE ECOLOGY AND POPULATIONS THROUGH RESEARCH, MONITORING AND INFORMATION EXCHANGE

3.1.1 Give a list of available literature that includes baseline information from studies carried out in your country on marine turtle populations and their habitats. [INF]

Bourjea, J., Lapegue, S., Gagnevin, L., Broderick, D., Mortimer, J.A., Ciccioine, S., Roos, D., Taquet, C., Griezel, H. 2007. Phylogeography of the green turtle, *Chelonia mydas*, in the Southwest Indian Ocean. Molecular Ecology 16: 175 - 186.

Broderick, D., Johanson, H., Lavery, S., Mortimer, J.A., Miller, J., Moritz, C. 1998. Genetic assessment of Western and Central Indian Ocean marine turtle stocks. Final report to the Department of Environment, Republic of Seychelles Government produced under the GEF EMPS J1 Turtle and Tortoise Conservation Project. 1-23 p.

Brooke, M.d.L., Garnett, M.C. 1983. Survival and reproductive performance of hawksbill turtles *Eretmochelys imbricata* L. on Cousin Island, Seychelles. Biological Conservation 25: 161-170.

Diamond, A. W 1976. Breeding biology and conservation of hawksbill turtles, *Eretmochelys imbricata* L. on Cousine Island, Seychelles. Biological Conservation 9: 199-215.

Domingue, G., Mortimer, J.A. 2001. The impact of commercial fisheries on turtles in Seychelles. 81 pp. In: Ciccione, S., Roos, D., Le Gall, J.-Y. (Eds.), Advance in Knowledge and Conservation of Sea Turtles in South-West Indian Ocean. 81 pp.81 pp.

Feare, C. 1979. Ecology of Bird Island, Seychelles.

Frazier, J.G. 1970. Report on sea turtles in the Seychelles Region. Mimeographed. 1-96 p.

Frazier, J.G. 1971. Observations on sea turtles at Aldabra Atoll. Philosophical Transactions of the Royal Society of London, Series B 260: 373-410.

Frazier, J.G. 1974. Sea turtles in Seychelles. Biological Conservation 6: 71-73.

Frazier, J.G. 1976. Report on sea turtles in the Seychelles Area. Journal of the Marine Biological Association of India 18: 179-214.

Frazier, J.G. 1979. Marine turtle management in Seychelles: A case-study. Environmental Conservation 6: 225-230.

Frazier, J.G. 1982. Status of marine turtles in the Central Western Indian Ocean. 385-389 p. In: Bjorndal, K. (Ed.), Biology and Conservation of Sea Turtles. 385-389 p. Smithsonian Institution Press, Washington D.C. 385-389 p.

Frazier, J.G. 1984. Marine turtles in the Seychelles and adjacent territories. 417-468 p. In: Stoddart, D.R. (Ed.), Biogeography and Ecology of the Seychelles Islands. 417-468 p. Junk, The Hague. 417-468 p.

Frith, C.B. 1975. Predation upon hatchlings and eggs of the Green turtle, *Chelonia mydas*, on Aldabra Atoll, Indian Ocean. Atoll Research Bulletin 185: 11-12.

Garnett, M., Frazier, J.G. 1979. Eretmochelys breeding biology in the Seychelles. pp. 954.

Gibson, T.S.H. 1979. Green turtle (*Chelonia mydas* (L.)) nesting activity at Aldabra Atoll. Philosophical Transactions of the Royal Society of London, Series B 286: 255-263.

Groombridge, B., Luxmoore, R. 1987. The green turtle and hawksbill (Reptilia: Cheloniidae) world status, exploitation and trade.

Hirth, H. F. 1969. Marine turtles in the Seychelles and Aldabra (British Indian Ocean Territory). Proceedings of the Working Meeting of Marine Turtle Specialists. 54-55 p.

Hirth, H.F., Carr, A. 1970. The Green turtle in the Gulf of Aden and the Seychelles Islands. 1-44 p. North-Holland Publishing Company, Amsterdam.

Hitchins, P.M., Bourquin, O., Hitchins, S. 2003. Inter-island nesting by Hawksbill turtles (*Eretmochelys imbricata*) in Seychelles. Phelsuma 11: 70-71.

Hitchins, P.M., Bourquin, O., Hitchins, S. 2003. Factors influencing emergences and nesting sites of Hawksbill turtles (*Eretmochelys imbricata*) on Cousine Island, Seychelles, 1995 - 1999. Phelsuma 11: 59-69.

Hitchins, P.M., Bourquin, O., Hitchins, S., Piper, S.E. 2004. Biometric data on hawksbill turtles (*Eretmochelys imbricata*) nesting at Cousine Island, Seychelles. Journal of Zoology 264: 371-381.

Hitchins, P.M., Bourquin, O., Hitchins, S. 2004. Nesting success of Hawksbill turtles (*Eretmochelys imbricata*) on Cousine Island, Seychelles. Journal of Zoology 264: 381-389.

Honegger, R.E. 1967. The green turtle (*Chelonia mydas japonica*) Thunberg in the Seychelles Islands. British Journal of Herpetology 4: 8-11.

Hornell, J. 1927. The turtle fisheries of the Seychelles Islands. 1-55 p.

Houghton, J.D.R., Callow, M.J., Hays, G.C. 2003. Habitat utilization by juvenile hawksbill turtles (*Eretmochelys imbricata*, Linnaeus, 1766) around a shallow water coral reef. Journal of Natural History 37: 1269-1280.

Houghton, J.D.R., Cedras, A., Myers, A.E., Liebsch, N., Metcalf, J.D., Mortimer, J.A., Hays, G.C. 2008. Measuring the state of consciousness in a free-living diving sea turtle. Journal of Experimental Marine Biology and Ecology 356: 115-120.

Hughes, G. R. 1971. Sea turtle research and conservation in South East Africa. Proceedings of the 2nd working meeting of marine turtle specialists. 57-67 p.

Ministry of Foreign Affairs, P.a.E. 1994. Seychelles moves to stop turtle-shell trade. Oryx 28: 229. Mortimer, J.A. 1984. Marine turtles in the Republic of the Seychelles: status and management. 1-80 p.

Mortimer, J.A. 1985. Recovery of green turtles on Aldabra. Oryx 19: 146-150.

Mortimer, J.A. 1986. Turtles, tortoises and terrapins of the Seychelles. 1-32 p. World Wildlife Fund/International, 1-32 p.

Mortimer, J.A. 1988. Green turtle nesting at Aldabra Atoll - population estimates and trends. Biological Society of Washington 8: 116-128.

Mortimer, J. A. and Bresson, R. 1994. The Hawksbill nesting population at Cousin Island, Republic of Seychelles: 1971 - 72 to 1991 - 92. 13th Annual Symposium on Sea Turtle Biology and Conservation. Proceedings of the Thirteenth Annual Symposium on Sea Turtle Biology and Conservation. 115-117 p.

Mortimer, J. A. and Bresson, R. 1994. Individual and age-dependent variations in clutch frequency among Hawksbill turtles at Cousin Island, Seychelles: 1973 - 1992. 14th Annual Symposium on Sea Turtle Biology and Conservation. Proceedings of the Fourteenth Annual Symposium on Sea Turtle Biology and Conservation. 94-96 p.

Mortimer, J.A., Collie, J., Mbindo, C. 1996. The status of sea turtle conservation in the Republic of Seychelles. 103-115 p. In: Humphrey, S.L., Salm, R.V. (Eds.), Status of sea turtle conservation in the Western Indian Ocean. 103-115 p. IUCN / UNEP, 103-115 p.

Mortimer, J.A. 1997. Turtle monitoring at Aldabra. 1-47 p.

Mortimer, J. A. and Collie, J. 1998. Status and conservation of sea turtles in the Republic of Seychelles. 17th Annual Sea Turtle Symposium. Proceedings of the Seventeenth Annual Symposium on Sea Turtle Biology and Conservation. 74-76 p.

Mortimer, J.A. 1998a. Turtle and tortoise conservation: Project J1 Environmental Management Plan of the Seychelles Volumes 1 of 2 (Final Version). 1-82 p.

Mortimer, J.A. 1998b. Turtle and tortoise conservation: Project J1 Environmental Management Plan of the Seychelles Volumes 2 of 2 (Appendices). 1-128 p.

Mortimer, J.A., Bresson,R. 1999. Temporal distribution and periodicity in hawksbill turtles (*Eretmochelys imbricata*) nesting at Cousin Island, Republic of Seychelles. Chelonian Conservation 3: 318-325.

Mortimer, J.A. 1999. World's first turtle shell stockpile to go up in flames as Miss World 1998 contestants look on. Chelonian Conservation and Biology 3: 376-377.

Mortimer, J.A. 1999. Turtle shell stockpile burnt. Oryx 33: 98-107.

Mortimer, J.A., Broderick,D. 1999. Population genetic structure and developmental migrations of sea turtles in the Chagos Archipelago and adjacent regions inferred from mtDNA sequence variation. 185-194 p. In: Sheppard,C.R.C., Seaward,M.R.D. (Eds.), Ecology of the Chagos Archipelago. 185-194 p. Linnean Society Occasional Publications 2, 185-194 p.

Mortimer, J.A. 2000a. Conservation of Hawksbill turtles (*Eretmochelys imbricata*) in the Republic of the Seychelles. 176-185 p. In: Pilcher, N.J., Ismail, G. (Eds.), Sea turtles of the Indo-Pacific: research, management and conservation. 176-185 p. ASEAN Academic Press Ltd., London. 176-185 p.

Mortimer, J. A. 2000b. Sea turtles in the Republic of Seychelles: An emerging conservation success story. 18th International Sea Turtle Symposium. Proceedings of the Eighteenth International Sea Turtle Symposium. 24-27 p.

Mortimer, J.A. 2000. Sea turtle conservation programmes: Factors determining success or failure. 1-371 p. In: Salm, R.V., Clark, J.R., Siirila, E. (Eds.), Marine and Coastal Protected Areas: A guide for planners and managers. 1-371 p. IUCN, Washington D.C. 1-371 p.

Mortimer, J.A. 2000. More effective turtle monitoring at Aldabra. pp. 1-2.

Mortimer, J. A. and Balazs, G. H. 2000. Post-nesting migrations of Hawksbill turtles in the granitic Seychelles and implications for conservation. 19th Annual Sea Turtle Symposium. Proceedings of the nineteenth annual symposium on sea turtle conservation and biology. 22-26 p.

Mortimer, J.A. 2001. International migrations of sea turtles tagged at Aldabra. Seychelles Islands Foundation Newsletter 7:3.

Mortimer, J. A., Collie, J, Jupiter, T, Chapman, R, Liljevik, A, and Betsy, B 2003. Growth rates of immature hawksbills (*Erytmochelys imbricata*) at Aldabra Atoll, Seychelles (Western Indian Ocean). 22nd Annual Symposium on Sea Turtle Biology and Conservation. 22nd Annual Symposium on Sea Turtle Biology and Conservation . 247-248 p.

Mortimer, J.A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP) - Turtle component: Final report - Appendices 1 to 11. 1-159 p.

Mortimer, J.A. 2004. Turtle Talk: Aldabra's mysterious sea turtles - well-travelled but "home-loving" navigators. Seychelles Island Foundation Newsletter 7: 5-6.

Mortimer, J.A. 2005a. Hawksbills in the Indian Ocean: Brief summary of status, trends, threats and available data. Western Pacific Sea Turtle Workshop - Hawksbill Turtles. Proceedings of the Western Pacific Sea Turtle. 97-100 p.

Mortimer, J.A. 2005b. Sea turtles of D'Arros Island and St. Joseph Atoll: Status and recommendations. Proceedings of a Scientific Symposium held at the D'Arros Research Centre 15 - 17 April 2005: D'Arros Research Centre Technical Report No.1. 54-72 p.

Mortimer, J.A., Jupiter, T., Collie, J., Chapman, R., Liljevik, A., Betsy, B., Stevenson, J., Laboudallon, V., Assary, M., Augeri, D., and Pierce, S. 2006. Trends in the Green turtle (*Chelonia mydas*) nesting population at Aldabra Atoll, Seychelles (WIO) and their implications for the region. 23rd Annual Symposium on Sea Turtle Biology and Conservation. Proceedings of the Twenty-Third Annual Symposium on Sea Turtle Biology and Conservation. 75-77 p.

Okayama, T., Diaz-Fernandez, R., Baba, Y., Halim, M., Abe, O., Azeno, N., Koike, H. 1999. Genetic diversity of the Hawksbill turtel in the Indo-Pacific and Caribbean regions. Chelonian Conservation and Biology 3: 362-367.

Remie, S., Mortimer, J.A. 2007. First records of Olive ridley turtles (*Lepidochelys olivacea*) in Seychelles. Marine Turtle Newsletter 117: 9-10.

Salm, R.V. 1976. Marine turtle management in Seychelles and Pakistan. Environmental Conservation 3: 267-268.

Seabrook, W. 1987. Examination of the impact of the feral cat (*Felis catus* L.) on the fauna of Aldabra Atoll, Seychelles, with recommendations on management. World Wildlife Fund (Project Report 1784).

Seabrook, W. 1989. The seasonal pattern and distribution of Green turtle (*Chelonia mydas*) nesting activity on Aldabra Atoll, Indian Ocean. Journal of Zoology 219: 71-81.

Wood, V.E. 1986. Breeding success of hawksbill turtles *Eretmochelys imbricata* at Cousin Island, Seychelles and the implications for their conservation. Biological Conservation 37: 321-332.

3.1.2 Have long-term monitoring programmes (i.e. of at least 10 years duration) been initiated or planned for priority marine turtle populations frequenting the territory of your country? [IND, BPR]

■ **YES** ☐ NO ☐ UNSURE

Aldabra atoll - since 1968 (Mortimer et al. 2006); ongoing
Aride island - since 1981 (Mortimer and Balazs 2000); ongoing
Bird island - since 1995 (Mortimer and Balazs 2000); ongoing
Curieuse Marine Park - since 1980 (Mortimer and Balazs 2000); ongoing
Cousin island - since 1973 (Mortimer and Bresson 1999); ongoing
Cousine island - since 1994 (Mortimer and Balazs 2000); ongoing
Grand Seour - since 1999 (Mortimer et al. 2003)
La Digue - since 1995 (Mortimer et al. 2003)
Mahe (southern beaches) - since 1995 (Mortimer et al. 2003)
Praslin - 1995 (Mortimer et al. 2003)
Ste. Anne Marine Park - since 1981 (Mortimer and Balazs 2000); ongoing

3.1.3 Has the genetic identity of marine turtle populations in your country been characterised? [INF, PRI]

■ **YES** ☐ NO ☐ UNSURE

During 1995-1997, as a component of the GEF Turtle and Tortoise Conservation Project (EMPS- J1), a total of 160 genetic samples were collected from nesting green turtles and nesting hawksbills throughout Seychelles, and 370 genetic samples were collected from foraging green turtles and foraging hawksbills throughout Seychelles. (Mortimer 1998aa.)

The results of the genetic analyses are presented in the following:

Broderick, D., Johanson, H., Lavery, S., Miller, J. and Moritz, C. 1998. Genetic Assessment of Western and Central Indian Ocean Marine Turtle Stocks. Final Report to the Department of Environment, Republic of Seychelles Government. 15 January 1998. 23 pp.

Mortimer, J.A., Broderick, D. 1999. Population genetic structure and developmental migrations of sea turtles in the Chagos Archipelago and adjacent regions inferred from mtDNA sequence variation. 185-194 p. In: Sheppard, C.R.C., Seaward, M.R.D. (Eds.), Ecology of the Chagos Archipelago. 185-194 p. Linnean Society Occasional Publications 2, 185-194 p.

Additional genetic samples from foraging turtles and also from stranded turtles continue to be collected on a routine basis, with the intention of eventually conducting more detailed genetic analysis using micro-satellites or other appropriate techniques.

Other genetic studies conducted on local turtle populations include the following:

Bourjea, J., Lapegue, S., Gagnevin, L., Broderick, D., Mortimer, J.A., Ciccioine, S., Roos, D., Taquet, C., Griezel, H. 2007. Phylogeography of the green turtle, *Chelonia mydas*, in the Southwest Indian Ocean. Molecular Ecology 16: 175 - 186.

Okayama, T., Diaz-Fernandez, R., Baba, Y., Halim, M., Abe, O., Azeno, N., Koike, H. 1999. Genetic diversity of the Hawksbill turtel in the Indo-Pacific and Caribbean regions. Chelonian Conservation and Biology 3: 362-367.

3.1.4 Which of the following methods have been or are being used to try to identify migration routes of turtles? Use the text boxes to provide additional details. [INF, PRI]

Tagging ■ **YES** ☐ NO

Major programmes to tag nesting females throughout the country (Mortimer and Bresson 1999; Mortimer and Balazs 2000; Mortimer et al. 2003; Mortimer et al. 2006). Nesting hawksbills have been tagged at Cousin Island since 1973, and elsewhere since 1981 (see section 3.1.2.). Nesting green turtles have been tagged intensively at Aldabra since 1981, and on a smaller scale elsewhere in the country. Tagging of juvenile green turtles and hawksbills has been taking place at Aldabra since 1986, and at other sites since 1995. Migrations of nesting and post-nesting hawksbill and green turtles are described in:

Mortimer, J.A. 2001. Turtle Talk: International migrations of sea turtles tagged at Aldabra. Seychelles Islands Foundation Newsletter 7:3.

Hitchins, P.M., Bourquin, O., Hitchins, S. 2003. Inter-island nesting by Hawksbill turtles (*Eretmochelys imbricata*) in Seychelles. Phelsuma 11: 70-71.

Satellite tracking ■ **YES** ☐ NO

Five post-nesting hawksbill satellite tracked from Cousin Island in January 1998. See:

Mortimer, J.A. and Balazs, G.H. 2000. Post-nesting migrations of hawksbill turtles in the granitic Seychelles and implications for conservation. In: Kalb, H. (compilers). Proceedings of the 19th Annual Sea Turtle Symposium. South Padre Island, Texas.

Two post-nesting hawksbills were satellite tracked from Mahe island in December 2007 by the Marine Conservation Society of Seychelles (MCSS). One of the two deployed transmitters is still active (as of June 2009), and the turtle's movements can be viewed on the website http://seychelles-turtles.blogspot.com/.

☐ **Other**

☐ **None of the above**

3.1.5 Have studies been carried out on marine turtle population dynamics and survival rates (e.g. including studies into the survival rates of incidentally caught and released turtles)? [INF, PRI]

☐ YES ■ **NO** ☐ UNSURE

Basic data have been collected, but not yet analysed in this regard.

3.1.6 Has research been conducted on the frequency and pathology of diseases in marine turtles? [INF, PRI]

■ **YES** ☐ NO ☐ UNSURE

Where nesting and foraging turtles are studied, injury and disease are routinely noted.

3.1.7 Is the use of traditional ecological knowledge in research studies being promoted? [BPR, PRI]

■ **YES** ☐ NO ☐ UNSURE

Fisherman and turtle hunters are consulted regarding their knowledge of turtle ecology and behaviour, and sometimes participate in field work.

3.2.1 List any regional or sub-regional action plans in which your country is already participating, which may serve the purpose of identifying priority research and monitoring needs. [INF]

A Marine Turtle Conservation Strategy and Action Plan for the Western Indian Ocean (IUCN-EARO and IUCN-MTSG) 1996.

A turtle conservation project has been drafted to be implemented jointed by Seychelles and Reunion. This project identifies priority actions for the years 2007 to 2010. The project is a component of a four year bilateral agreement signed between the Seychelles and French agreement.

3.2.2 On which of the following themes have collaborative studies and monitoring been conducted? Use the text boxes to describe the nature of this international collaboration or to clarify your response. Answer 'NO' if the studies/monitoring undertaken do not involve international collaboration. [INF, PRI]

a) Genetic Identity ■ **YES** ☐ NO ☐ NOT APPLICABLE

Genetic characteristics compared between Seychelles turtles and those of: the Arabian Gulf, Australia, Europa, Tromelin and Chagos (BIOT):

Broderick, D., Johanson, H., Lavery, S., Miller, J. and Moritz, C. 1998. Genetic Assessment of Western and Central Indian Ocean Marine Turtle Stocks. Final Report to the Department of Environment, Republic of Seychelles Government. 15 January 1998. 23 pp.

Mortimer, J.A. & Broderick, D. 1999. Population genetic structure and developmental migrations of sea turtles in the Chagos Archipelago and adjacent regions inferred from mtDNA sequence variation. Pp. 185-194, in Sheppard, CRC and Seaward, MRD (eds). Ecology of the Chagos Archipelago. Linnean Society Occasional Publications 2.

Bourjea, J., Lapegue, S., Gagnevin, L., Broderick, D., Mortimer, J.A., Ciccioine, S., Roos, D., Taquet, C., Griezel,H. 2007. Phylogeography of the green turtle, *Chelonia mydas*, in the Southwest Indian Ocean. Molecular Ecology 16: 175 -186.

b) Conservation status ☐ YES ☐ NO ■ **NOT APPLICABLE**

c) Migrations ■ **YES** ☐ NO ☐ NOT APPLICABLE

Migrations of green and hawksbill turtles are described in:

Mortimer, J. A. and Balazs, G. H. 1999. Post-nesting migrations of hawksbill turtles in the granitic Seychelles and implications for conservation. Proceedings of the nineteenth annual symposium on sea turtle conservation and biology.

Mortimer, J.A., Broderick, D. 1999. Population genetic structure and developmental migrations of sea turtles in the Chagos Archipelago and adjacent regions inferred from mtDNA sequence variation. 185-194 p. In: Sheppard, C.R.C., Seaward, M.R.D. (Eds.), Ecology of the Chagos Archipelago. 185-194 p. Linnean Society Occasional Publications 2, 185-194 p.

Mortimer, J. A. and Balazs, G. H. 2000. Post-nesting migrations of Hawksbill turtles in the granitic Seychelles and implications for conservation. 19th Annual Sea Turtle Symposium. Proceedings of the nineteenth annual symposium on sea turtle conservation and biology. 22-26 p.

Mortimer, J.A. 2001. International migrations of sea turtles tagged at Aldabra. Seychelles Islands Foundation Newsletter 7:3.

d) Other biological and ecological aspects ■ **YES** ☐ NO ☐ NOT APPLICABLE

Pooling of data from 17 monitoring areas under the "Strategic Management of Turtles" programme - will allow for better comparison of both biological and ecological aspects to be accomplished.

☐ **Other**

3.3.1 List, in order of priority, the marine turtle populations in your country in need of conservation actions, and indicate their population trends. [PRI]

Green turtle nesting populations:
Increasing:
- Aldabra
- Silhouette

Probably decreasing, stable or unknown:
- Elsewhere in the country

Hawksbill nesting populations:
Increasing:
- Aride island;
- Bird island;
- Cousin island;
- Cousine island;
- Curieuse island.

Probably stable or decreasing:
- Ste. Anne Marine Park;

Probably decreasing:
- Most of the outer islands

Definitely decreasing:
- Mahe, Praslin, La Digue

(See Hornell 1927; Frazier Honegger 1967; Hirth and Carr 1970; Mortimer 1984; Mortimer and Bresson 1994; Mortimer and Bresson 1999; Mortimer 2004 (Appendix 1); Mortimer 2005a; Mortimer et al. 2006, section 3.1. for population numbers and trends.)

3.3.2 Are research and monitoring activities, such as those described above in Section 3.1 periodically reviewed and evaluated for their efficacy? [SAP]

■ **YES** ☐ NO ☐ UNSURE

3.3.3 Describe how research results are being applied to improve management practices and mitigation of threats (in relation to the priority populations identified in 3.3.1, among others). [SAP]

A component part of the BHC/MCSS Strategic Management of Turtles Programme compiled monitoring and management activities based upon current research and individual stakeholder capacity and resources. A database was developed specifically from this.

3.4.1 Has your country undertaken any initiatives (nationally or through collaboration with other Range States) to standardise methods and levels of data collection? [BPR, INF]

■ **YES** ☐ NO ☐ UNSURE

Turtle monitoring programme using standardised techniques was initiated at a national level, and training of personnel ongoing under several government and NGO programmes during the past two decades (Mortimer 1998aa). The Ministry of Environment and Natural Resources has coordinated and approved these programmes.

Under the BHC/MCSS Strategic Management of Turtles Programme, standardised electronic monitoring protocols protocols are available on the restricted area of the website (www.seychellesturtles.org) resulting from the project. An e-turtle database has been set up whereby all the stakeholders feed data into a centralized database.

With Kelonia Centre (Reunion) a component of the proposed regional project, makes provision for a common GIS database.

3.4.2 To what extent does your country exchange scientific and technical information and expertise with other Range States? [SAP, IND]

☐ OFTEN (SYSTEMATICALLY) ■ **OCCASIONALLY** ☐ RARELY ☐ NEVER

3.4.3 If your country shares scientific and technical information and expertise with other Range States, what mechanisms have commonly been used for this purpose? Comment on any positive benefits/outcomes achieved through these interactions. [INF]

- The project mounted with Kelonia and Ifremer of Reunion has a component for the sharing of expertise on hawskbill and green turtles. Workshops and exhibitions will also be carried out in both countries for that purpose. This project is in the context of a bilateral agreement.

- Reports and publications, personal communications, presentations at international meetings.

3.4.4 Does your country compile and make available to other countries data on marine turtle populations of a regional interest? [INF]

■ **YES** ☐ NO ☐ UNSURE

- See list of reports and publications.
- With Reunion Island (KELONIA/ IFREMER), a common GIS-based database will be set up whereby data will be shared between these two countries.

OBJECTIVE IV. INCREASE PUBLIC AWARENESS OF THE THREATS TO MARINE TURTLES AND THEIR HABITATS, AND ENHANCE PUBLIC PARTICIPATION IN CONSERVATION ACTIVITIES

4.1.1 Describe the educational materials, including mass media information programmes that your country has collected, developed and/or disseminated. [INF, PRI]

Educational booklets for school children:
- Mortimer, J.A. 1986. "Turtles, Tortoises and Terrapins of the Seychelles." A conservation education booklet for children produced for the Ministry of Education, Seychelles. Typeset publication 32 pp., 29 illustrations. Funded by WWF-International.
- Mortimer, J.A. 1986. Teacher's Manual to Accompany "Turtles, Tortoises and Terrapins of the Seychelles." 26 pp., unpublished. Funded by WWF-International.
- Mortimer, J.A. 1995. Teaching Critical Concepts for the Conservation of Sea Turtles. Marine Turtle Newsletter. 71:1-4.

Educational videos for school children:
- "Nesting on the Verge of Extinction." 1987. Video about the natural history and conservation of the hawksbill turtle in Seychelles. Produced in collaboration with the National Audio-Visual Centre of Seychelles.
- "Turtles, Tortoises and Terrapins of Seychelles--their natural history and conservation." 1986. Video-taped slide-show for classroom use. Produced in collaboration with the National Audio-Visual Centre of Seychelles.

Website (www.seychellesturtles.org) developed with both public and restricted areas; the public site gives general information about Seychelles turtles and the various organisations and their monitoring projects. There is a need to promote the website nationally. Informational brochures for the general public and tourists. MCSS sends newsletter to individuals and organisations that contribute to their turtle fund.

Talks to school children are given regularly, especially for the SUBIOS underwater festival.

Public awareness programmes on Television and Radio including:
- special documentaries;
- news items;
- public awareness - spots - during prime time television.

MCSS in conjunction with Wildlife Clubs of Seychelles, ran several school based competitions in the early months of 2008 to raise awareness of turtles and included a name-the-turtle draw for the name of one satellite tagged turtle. The daily track of one satellite tracked turtle was also made available through seaturtle.org for the clubs to use for school projects which are on-going.

4.1.2 Which of the following groups have been the targets of these focused education and awareness programmes described in above in Section 4.1.1? [PRI, INF]

- ■ **Policy makers**
- ☐ Fishing industry
- ☐ Local/Fishing communities
- ☐ Indigenous groups
- ■ **Tourists**
- ■ **Media**
- ■ **Teachers**
- ■ **Students**
- ■ **Military, Navy, Police**
- ■ **Scientists**
- ☐ Other:
- ☐ None of the above

The Education, Information and Communication (EIC) Section of the Ministry of Environment and Natural Resources (MENR) facilitates awareness and education programmes for the above groups.

A full-time environmental education coordinator is employed by the Ministry of Education who facilitates the liaison between the Ministries of Environment and Education. Publications (leaflets, booklets, books, posters) are produced for teachers and school children. A new programme was initiated for student teachers at the National Institute of Education whereby they are taught modules of environmental education, which includes a 'turtles' component. This is a compulsory programme. A fullt-time environment education teacher is also employed.

To commemorate 'World Environment Day' on June 5th 2003, a 'Save the turtles' March was organised which grouped at least 600 individuals from all government sectors, schools, conservation NGOs. Banners with different messages about the endangerment of marine turtles were displayed, leaflets were also handed out to members of the general public to raise their awareness about marine turtles, the Minister of Environment gave a strong speech emphasising the importance of turtle conservation.

Throughout production phase of media programs or news, the journalists or producers compile information with the technical support of staff from the MENR, which helps them enrich their knowledge about marine turtles.

Turtle watchers' code of conduct has been designed for visitors and eco-tourism establishments to allow an interaction with turtles on the beach that do not disturb nesting.

4.1.3 Have any community learning / information centres been established in your country? [BPR, SAP]

■ **YES** ☐ NO

All schools have an "Environmental Corner" in the school library.

Nature Seychelles / Wildlife Clubs (NGOs) operate a Roving Environmental Education Facility (REEF) vehicle, and has been constructing a Wildlife Club Centre at Roche Caiman. A New Centre has also been constructed on Praslin (Nature Seychelles) to cater for wildlife clubs and for kids on field trips.

The NPTS Silhouette Conservation Project Information Centre established in 1999 is open to children on feild trips,

tourists and all visitors to Silhouette. Information is given to all to enrich thrir knowledge concerning sea turtles with advice on how to behave when photographing nesting turtles on the hotel beach in the appropriate season.

4.2 Alternative livelihood opportunities [IND, BPR] Describe initiatives already undertaken or planned to identify and facilitate alternative livelihoods (including income-generating activities) for local communities.

An Artisan Re-training and Compensation Programmes were conducted during 1993-94. These programme was funded in part by GEF and in part by the Government of Seychelles to provide alternate livelihoods for tortoiseshell artisans. Artisnas were compensated for forgoing turtle shells and shifting to alternative artisanal work.

4.3.1 Describe initiatives already undertaken or planned by your country to involve local communities, in particular, in the planning and implementation of marine turtle conservation programmes. Please include details of any incentives that have been used to encourage public participation, and indicate their efficacy. [BPR, IND]

It is now Government policy to conduct Stakeholder meetings whenever national strategy or action plans are being developed regarding environmental issues -- for example the NBSAP (National Biodiversity Strategy and Action Plan).

A study was done in 2001, which involved communities residing adjacent to beaches in South Mahe whereby people were interviewed about their knowledge on the biology of marine turtles and their willingness to protect marine turtles.

4.3.2 Describe initiatives already undertaken or planned to involve and encourage the cooperation of Government institutions, NGOs and the private sector in marine turtle conservation programmes. [IND, BPR]

A project to coordinate turtle stakeholders, produce centralised turtle database and Strategic Action Plan for Seychelles is being conducted by Marine Conservation Society of Seychelles (MCSS) with funding from British High Commission (BHC).

Note that the Ministry of Environment and Natural Resources (MENR) encourages the private sector to take on species conservation projects thus freeing government personnel to focus on policy issues, prosecution, etc.

Efforts have been made to involve coastal residents in turtle monitoring and conservation. Some members of the community in the South of Mahe are actively involved in reporting nesting activities on beaches. They either fill in forms or call the Ministry through the Greenline (Environmental hotline).

OBJECTIVE V. ENHANCE NATIONAL, REGIONAL AND INTERNATIONAL COOPERATION

5.1.1 Has your country undertaken a national review of its compliance with Convention on International Trade in Endangered Species (CITES) obligations in relation to marine turtles? [SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

The 1994 legislation, Wild Animals (Turtles) Protection Legisalation, closed legislative loopholes relevant to Seychelles' implementation of CITES as they pertained to turtles.

5.1.2 Does your country have, or participate/cooperate in, CITES training programmes for relevant authorities? [SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

5.1.3 Does your country have in place mechanisms to identify international illegal trade routes (for marine turtle products etc.)? Please use the text box to elaborate on how your country is cooperating with other States to prevent/deter/eliminate illegal trade. [SAP]

■ **YES** ☐ NO ☐ NOT APPLICABLE

The Authorities in Seychelles are in direct contact with Interpol and CITES Management Authorities. Random search mechanism by Airport Police is at times able to detect turtle products going out of the country. However, there is evidence that trade (illegal) may still continue given that anecdotal reports state that people are still smuggling shells out of the country.

5.1.4 Which international compliance and trade issues related to marine turtles has your country raised for discussion (e.g. through the IOSEA MoU Secretariat, at meetings of Signatory States etc.)? [INF]

Issue of trade in hawksbill shell raised at CITES meeting.

5.1.5 Describe measures in place to prevent, deter and eliminate domestic illegal trade in marine turtle products, particularly with a view to enforcing the legislation identified in Section 1.5.1. [INF]

The "Wild Animals and Birds Protection Act" imposes complete ban on domestic trade in turtles or their parts. (However, because of our huge exclusive economic zone (1.33 million km2), enforcement and surveillance is very difficult and costly.)

Wild Animals (Turtles) Protection (Amendment) Regulations 1998 made it illegal for anyone to possess raw hawksbill shell (see item 1.5.1.)

Wild Animals and Birds Protection (Amendment) Act, 2001 provided for stronger penalties for offences (see item 1.5.1).

Partnership between MENR and the public was developed with the establishment of the "Greenline" which enables members of the public to report any illegal activities, even anonymously.

Partnership exists with the Fishing Authorities ant the Coast Guard so that they can assist in surveillenace and at all times they are involved in operations to arrest poachers and to confiscate illegal products.

Training of law enforcement personnel: In 2003, a workshop was conducted by the Attorney General's office to train MENR personnel in collecting evidence for the purpose of enforcing environmental laws.

Environment education and awareness programmes are changing peoples' attitudes towards sea turtles, by encouraging them to value these animals more for aesthetic reasons and for tourism potential rather than for consumption.

5.2.1 Has your country already developed a national action plan or a set of key management measures that could eventually serve as a basis for a more specific action plan at a national level? [IND]

■ **YES** ☐ NO

Various projects have addressed this in the past.

The GEF SEYMEMP (Seychelles Marine Ecosystem Management Plan) project addressed this from various angles.

Under the BHC/MCSSS Strategic Management of Turtles Programme (2003-2005), a National Strategy and Action Plan was developed and adopted in 2005 through a series of stakeholder workshops after which it was endorsed by MENRT.

5.2.2 From your country's perspective, which conservation and management activities, and/or which particular sites or locations, ought to be among the highest priorities for action? [PRI]

In order of priority (highest to lowest):

- 5.1 (d): Identify routes of illegal trade through monitoring, and seek cooperation to take action to prevent, deter and where possible, eliminate illegal trade.
- 5.4(a): Identify needs for capacity building in terms of human resources, knowledge and facilities.

- 5.4(d): Develop partnerships with universities, research institutions, training bodies and other relevant organisations.
- 4.3(c): Implement, where appropriate, incentive schemes to encourage public participation (e.g.T-shirts for tag returns, public acknowledgement, certificates).
- 3.4(c): Exchange at regular intervals scientific and technical information and expertise among nations, scientific institutions, non-governmental and international organisations, in order to develop and implement best practise approaches to conservation of marine turtles and their habitats.
- 6.3(h): Explore international funding support and other incentives for signatory states that effectively manage marine turtle populations, which might include the complete prohibition of direct harvest (capture or killing)
- 1.4(d): Liaise and co-ordinate with fisheries industries and fisheries management organisations to develop and implement incidental capture mitigation mechanisms in national water and on the high seas.
- 5.3(a): Identify and strengthen existing mechanisms for co-operation at the sub-regional level.
-4.1(c): Develop and implement accurate mass media information programmes.
-2.2(a): Re-vegetate, where appropriate, frontal dunes at nesting beaches, with indigenous flora as far as possible, in order to provide visual barriers to coastal development; and to restore appropriate beach temperature regimes.

5.2.3 Please indicate, from your country's standpoint, the extent to which the following local management issues require international cooperation in order to to achieve progress. [PRI]

Illegal fishing in territorial waters	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Incidental capture by foreign fleets	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Enforcement/patrolling of territorial waters	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Hunting/harvest by neighboring countries	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Poaching, illegal trade in turtle projects	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Development of gear technology	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Oil spills, pollution, marine debris	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Training / capacity-building	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Alternative livelihood development	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Identification of turtle populations	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Identification of migration routes	■ **ESSENTIAL** ☐ IMPORTANT ☐ LIMITED ☐ NOT AT ALL
Tagging / satellite tracking	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Habitat studies	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL
Genetics studies	☐ ESSENTIAL ■ **IMPORTANT** ☐ LIMITED ☐ NOT AT ALL

1. Information sharing (via internet) particularly on poaching incidences or just highlighting incidences of international trade including the trend. This will put other state parties on the alert.

2. Information sharing of current management practices that are producing tangible outputs. This will allow countries to apply and adapt these practices where applicable.

5.3.1 Identify existing frameworks/organisations that are, or could be, useful mechanisms for cooperating in marine turtle conservation at the sub-regional level. Please comment on the strengths of these instruments, their capacity to take on a broader coordinating role, and any efforts your country has made to enhance their role in turtle conservation. [INF, BPR]

Bilateral agreements signed between governments are powerful frameworks since they recieve political will and are allocated specific funding for activities. Through a bilateral agreement signed between Seychelles and Reunion, a joint project aimed at turtle conservation in the region has been drafted.

5.3.2 Has your country developed, or is it participating in, any networks for cooperative management of shared turtle populations? [BPR, INF]

☐ YES ■ **NO** ☐ NOT APPLICABLE

5.3.3 What steps has your country taken to encourage Regional Fishery Bodies (RFBs) to adopt marine turtle conservation measures within Exclusive Economic Zones (EEZs) and on the high seas? [SAP]

Rewards for international returns of turtle tags include a Save the Turtles T-Shirt and a letter describing the history of the turtle.

5.4.1 Describe your country's needs, in terms of human resources, knowledge and facilities, in order to build capacity to strengthen marine turtle conservation measures. [PRI]

Surveillance and Patrol equipment:
- Patrol boats and accessory equipment; and
- Remote surveillance equipment; etc.

Training needs relative to reptile veterinary medicine for:
- Treatment of injured or sick turtles; and
- Post-mortems, etc.

Training in terms of turtle biology and also identification techniques necessary not only to ensure proper gathering of data but also to be able to act as expert witnesses in poaching cases.

5.4.2 Describe any training provided in marine turtle conservation and management techniques (e.g. workshops held, training manuals produced etc.), and indicate your plans for the coming year. [PRI, INF]

Workshops are conducted regularly regarding marine turtle conservation and management techniques for personnel from the following sectors:
- Governmental -- i.e., MENR;
- Parastatal -- i.e. SIF; Marine Parks Authority (MPA);
- NGOs -- i.e. Nature Seychelles; MCSS ; and
- Private Sector (representatives from private islands, hotels with nesting beaches, etc.)

These workshops have all been coordinated by the Ministry of Environment, except for one coordinated by MCSS last year.

Training Manual Produced for Aldabra:
- Mortimer, J.A. 1997. Turtle Monitoring at Aldabra--1997 version. Monitoring protocol produced by EMPS Project J1: Turtle and Tortoise Conservation. 47 pages.

Other training manuals are in preparation.

Through a project in conjunction with Kelonia centre, Reunion, training in turtle pathologies is planned as well as the sharing of experience through workshops and other exchanges.

5.4.3 Specifically in relation to capacity-building, describe any partnerships developed or planned with universities, research institutions, training bodies and other relevant organisations. [BPR]

Locally, partnerships are being developed with NGOs and private sector. These bodies eventually carry out monitoring, and at some level, enforcement of the areas under their management.

TAGS (Turtle Action Group of Seychelles) was registered in 2007 as an association and groups all stakeholders in the country working on marine turtles -- include Government agencies, NGOs, private companies etc..

With the Kelonia Centre, training will be provided to Seychellois personnel in pathologies while Seychelles experts will provide training in hawksbill research.

5.5.1 National policies and laws concerning the conservation of marine turtles and their habitats will have been described in Section 1.5.1. Please indicate their effectiveness, in terms of their practical application and enforcement. [SAP, TSH]

Wild Animals and Birds Protection (Amendment) Act, 2001 increased penalties for offences. Prison time was doubled (from one year to two years); and maximum fines were increased by 500 times (from Rs1000 to Rs 500,000).

Confiscation of vessels, vehicles, aircraft, and gear was also enabled. So far only, one case where several offenders were caught with turtle meat have been prosecuted under this legislation. Although the law may be effective in protecting the turtles, it is observed that it does not offer much protection to their habitat. Habiatt destruction is nowadys a major threat to marine turtles.

5.5.2 Has your country conducted a review of policies and laws to address any gaps, inconsistencies or impediments in relation to marine turtle conservation? If not, indicate any obstacles encountered in this regard and when this review is expected to be done. [SAP]

■ **YES** ☐ NO ☐ UNSURE

Gaps were identified in the Wild Animals and Birds Protection Act, through which poachers were getiing away with weak punishmnets which were not a deterent against poaching. To this effect, an amendment for stronger penalties was made in 2001.

5.5.3 From the standpoint of law enforcement, has your country experienced any difficulties achieving cooperation to ensure compatible application of laws across and between jurisdictions? [TSH]

☐ YES ■ **NO** ☐ UNSURE

OBJECTIVE VI. PROMOTE IMPLEMENTATION OF THE MoU INCLUDING THE CONSERVATION AND MANAGEMENT PLAN

6.1.1 What has your country already done, or will it do, to encourage other States to sign the IOSEA MoU? [INF]

n/a

6.1.2 Is your country currently favourable, in principle, to amending the MoU to make it a legally binding instrument? [INF]

☐ YES ■ **NO** ☐ NO VIEW

6.1.3 Would your country be favourable, over a longer time horizon, to amending the MoU to make it a legally-binding instrument? [INF]

☐ YES ■ **NO** ☐ NO VIEW

6.2 Secretariat and Advisory Committee

6.2.1 What efforts has your country made, or can it make, to secure funding to support the core operations of the IOSEA MoU (Secretariat and Advisory Committee, and related activities)? [IND]

n/a

6.3.1 What funding has your country mobilised for domestic implementation of marine turtle conservation activities related to the IOSEA Marine Turtle MoU? Where possible, indicate the specific monetary values attached to these activities/programmes, as well as future plans. [IND]

6.3.2 Has your country tried to solicit funds from, or seek partnerships with, other Governments, major donor organisations, industry, private sector, foundations or NGOs for marine turtle conservation activities? [IND]

■ YES ☐ NO

The GEF WorldBank financed the Marine Ecosystems Project 2000-2004.

British High Commission (BHC) financed projects by MCSS.

Turtle projects have been funded by Hotels (i.e., Banyan Tree on Mahe; Lemuria on Praslin).

Private islands are funding their own island conservation programmes.

Private companies can make contributions to the Environment Trust Fund (this may be used for turtle related activities as well).

Seychelles Islands Foundation (SIF) is a parastatal body responsible for the management of two World Heritage sites in Seychelles (including Aldabra and Vallee de Mai). Fees paid to visit these sites are used to fund conservation projects on Aldabra.

Money generated from eco-tourism activities at other islands also fund conservation projects -- e.g., at Cousine, Bird, Aride, Cousin, etc.

The project mounted in the context of regional coorporation with Kelonia Centre, Reunion, is soliciting funds from the European Union to implement activities aimed towards marine turtle conservation in the region.

6.3.3 Describe any initiatives made to explore the use of economic instruments for the conservation of marine turtles and their habitats. [BPR]

As part of the Marine GEF project a socio-economic component addressed the use of some economic instruments.

6.4.1 Has your country designated a lead agency responsible for coordinating national marine turtle conservation and management policy? If not, when is this information expected to be communicated to the IOSEA MoU Secretariat? [IND]

■ **YES** ☐ NO

The Conservation Section of the Ministry of Environment, Natural Resources and Transport.

6.4.2 Are the roles and responsibilities of all government agencies related to the conservation and management of marine turtles and their habitats clearly defined? [IND]

■ **YES** ☐ NO ☐ UNSURE

The Conservation Section is the key agency dealing with turtle conservation and management and has the role of overseeing all issues pertaining to these.

6.4.3 Has your country ever conducted a review of agency roles and responsibilities? If so, when, and what was the general outcome? If not, is such a review planned and when? [SAP],

☐ YES ■ **NO** ☐ UNSURE

TAGS (Turtle Action Group of Seychelles) groups all stakeholders working with marine turtles in the country. Steps are being undertaken for an MoU on data sharing to be signed.

More work will be done to finalise MOUs with NGOs, private sector and government. The role and responsibilities of these bodies will be clearly defined.

Comments/suggestions to improve the present reporting format:

The new section on "Sites-Threats" is great! But, it could be improved a bit.... in particular:

In the section labelled "Research" the following choices are presented:
-- Tagging
-- Genetic Sampling
-- Satellite Tracking
-- Foraging Surveys

But, in fact, you've left off what is possibly the most important basic research that can be done on the nesting beach:
-- "Nesting Surveys" (This should be included as basic baseline surveys of nesting beaches, and also long term regular monitoring of a nesting population using "Track Counts". (This is more important than "Tagging"))

Additional information not covered above:

Acronyms used in this National Report:

GEF SEYMEMP = GEF Seychelles Marine Ecosystem Management Project
ICS = Island Conservation Society
IMPASP = Integrated Marine Protected Area Systems Plan
MCSS = Marine Conservation Society Seychelles
MENR = Ministry of Environment and Natural Resources
SFA = Seychelles Fishing Authority
SIF = Seychelles Islands Foundation
PPS = Policy Planning and Services Division (MENR)
NPTS = Nature Protection Trust of Seychelles