Madagascar

GENERAL INFORMATION

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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]

Five species of marine turtles frequent the coast of Madagascar, namely the Green *(Chelonia mydas)*, Hawksbill *(Eretmochelys imbricata)*, Loggerhead *(Caretta caretta)*, Olive Ridley *(Lepidochelys olivacea)*, and to a lesser extent the Leatherback *(Dermochelys coriacea)* turtle (Rakotonirina and Cooke 1994; Walker and Roberts 2005). With the exception of leatherback turtles, all of these species nest on Malagasy beaches (Walker and Roberts 2005).

Marine turtle nesting beaches include: Nosy Hara and Nosy Iranja in the north-west of Madagascar, Ankaramany, Enakao, Ibakiky, Elodrato, Antsotso, Evatraha and Sainte Luce / Fort Dauphin area in the south-east; Masoala in the north-east; Ile Sainte Marie (east); Iles Barrens in Western Madagascar; and Beheloka, Toliara, Ifaty, Ampasimanoro, Maromena and Besambay in the south-west (Durbin and Rakotoniana 1991; Rakotonirina and Cooke 1994; Kemf et al. 2000; Walker et al. 2004; Humphrey and Wilson 2005; Walker and Roberts 2005; Metcalf et - al. 2007). Other suitable nesting beaches have been identified in the north-west, but no nesting is taking place in these areas, presumably as a result of human disturbance (Walker and Roberts 2005; Rakotonirina and Cooke 1994).

Suitable foraging habitats (shallow coral reefs and seagrass beds) have been identified in north-west Madagascar, Nosy

Iranja, Radama Islands and Nosy Hara Archipelago (Metcalf et al. 2007). Tag returns indicate that turtles tagged in South Africa, Europa, Tromelin, and Seychelles utilise these areas to some extent (Metcalf et al. 2007; Hughes).

Ninety kilometres of coastline north of Tolagnaro are being monitored and conservation work is being carried out for loggerhead, green, olive ridley and hawksbill turtles. Community meetings were held to discuss marine turtle conservation issues and develop ideas for alternative livelihoods given that the marine turtle harvest is illegal and due to concerns about sustainability. Similar initiatives are operating in Ifaty, province of Toliara, and Andavadoaka, both areas located in the southwest of Madagascar.

Population declines had already been noted as early as the end of the First World War (Petit 1930 in Hughes 1973). The fundamental reason for the decline of turtles in Madagascar is thought to be due to overexploitation in the form of hunting for meat and/or carapaces and raiding of nests (Hughes 1973; Frazier 1980; Rakotonirina and Cooke 1994). Turtle populations are opportunistically hunted by the local people, in artisanal and subsistence fishing. Turtles have also played a very important role in the culture of the Vezo tribe in the south-west, although to a lesser extent now than before (Hughes 1973; Rakotonirino and Cooke 1994). The cultural importance of turtles, however, appears to becoming obsolete, with fewer people adhering to these traditions. More research is needed to determine the current status of, and the threats impacting on, the Malagasy marine turtle populations (Walker and Roberts 2005).

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]

Best practice approaches that have been adapted and/or adopted with success are:

- The implementation, support for and monitoring of community agreements, called *Dina*(traditional social code), in the Malagasy language. Rakotoson and Tanner (2006)* demonstrated the importance of incorporating *Dina* into current governmental laws, to ensure compliance by local communities, also in terms of the regulation of marine resources. *Rakotoson, L.R. and Tanner, K. 2006. Community-based governance of coastal zone and marine resources in Madagascar. *Ocean and Coastal Management* 49: 855 - 872.

- Community collaboration and meetings (e.g. Walker and Robert 2005; Lilette 2006; NGOs - Blue Ventures Conservation, Reef Doctor).

- Educational sessions with schools, fishermen and communities by NGOs (eg. Blue Ventures Conservation; Reef Doctor). Education and awareness campaigns are thought to be very useful in changing people's perceptions towards marine turtles and their conservation; local communities are generally open to discussions about conservation, and are relatively knowledgeable about turtle biology (Walker and Roberts 2005; Metcalf et al. 2007). More NGOs, such as Reef Doctor (Miamby Fano), Blue Ventures Conservation and, are actively conducting research and/or engaging in the education of the local people in terms of turtle conservation and the marine environment in general.

- Capricorn Coastal Alliance has been established to coordinate the conservation and research efforts of individual governmental and non-organisations (IHSM - Institut Halieutique et des Sciences Marines, COUT - Cellule des Oceanographes de l'Universite de Toliara, RESOLVE, Reef Doctor, Blue Ventures Conservation, Frontier Madagascar). This helps to direct research efforts and ensures better communication between research/conservation organisations, which in turn facilitates the identification, implementation and management of a network of - conservation sites and marine protected areas in the region.

- In 2005, all industrial prawn trawlers were fitted with TEDs. This device has significantly reduced the number of turtles caught as by-catch (Humphrey and Wilson 2005).

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]

Walker et al. (2004) and Walker and Roberts (2005) investigated the economic and cultural importance of sea turtles to coastal communities in south-west Madagascar. Overexploitation has caused the specialist turtle fishery to collapse (Walker et al. 2004). However, there exists a trade network for turtle products in the Toliara region, in spite of it being illegal. Turtles are generally caught incidentally or opportunistically by artisanal and traditional fishers, in this multi-species fishery. Dealers buy live turtles from fisherman and sell it to traders, thus ensuring a relatively constant supply of meat and other turtle products to consumers (Walker et al. 2004). One turtle could generate a substantial revenue to a household (up to US$74 per large, live animal; Walker et al. 2004).

NGOs such as Blue Ventures Conservation and Reef Doctor (notably as part of their Miamby Fano programme) are collecting information on the economic, social and traditional importance of marine turtles to local communities, such as the Vezo people.

A study by Lilette (2006) investigated the perceptions of the Vezo people in relation to the conservation of marine turtles (specifically the Green turtle) and the effect of traditional, economic and social factors on the success of conservation efforts. At least some proportion of fishermen asserted that they would stop hunting marine turtles if it were economically viable for them to do so.

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: Fewer people adhere to traditional taboos against eating turtle meat than previously (Metcalf et al. 2007).

■ Other2: Increasingly more people migrate to coastal areas, which puts more pressure on marine (including turtle) resources (Cooke et al. 2000).

☐ Other3:

☐ None of the above or Not Applicable

High prices: The decline in turtle populations has resulted in an increase in the price of turtle meat; a single, large turtle could earn a fisherman US$ 74 (Walker et al. 2004), making even an opportunistic/incidental turtle catch quite lucrative.

Low penalties: In spite of a long-standing law prohibiting the exploitation of turtles, law enforcement, and compliance by fisherman (specifically of people groups traditionally dependent on turtle products) is very poor (Walker and Roberts 2005).

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)

Recent studies have stressed the need to develop alternative livelihoods for impoverished coastal communities (Walker and Roberts 2005). There is, however, no known national initiative to address the economic situation.

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

Shrimp trawling: takes place off the north-west of Madagascar (Hughes 1976). According to Hughes (1976), this is also the area harbouring large numbers of Olive Ridley turtles.

b) Set gill nets: ■ YES ☐ NO

Gill nets are used by artisanal shark-fishermen, who reportedly catch turtles incidentally when they ascend beaches (Metcalf et al. 2007). This fishery is seasonal, with no or limited fishing taking place form April to September due to rough seas (Walker and Roberts 2005).

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

Blue Ventures has deployed two FADs in the Andavadoaka region by 2004, with 20 more deployments planned. This was done in an effort to reduce fishing pressure on reefs in the region.

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

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

f) Driftnet: ☐ YES ■ NO

g) Other1:

h) Other2:

☐ **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: Only 46 fishing vessels were operational on all the Malagasy shrimp fisheries in 2008, 43, in 2009.

Between 2006 and 2007, there was a significant decrease (-20 %) in the number of fishing days. This was due to:

- a reduction in the number of boats in operation, by 10%
- a decrease of 11% in the number of days of fishing per boat, which dropped from 219 days in 2006 to 195 days in 2007.

The level of the output per day and units of fishing, on the other hand, has been increasing since 2005. The volume of the captures/day of fishing/boat is 480 kg in 2007 compared with 447 kg in 2006 (+ 7%) and 397 kg in 2005, respectively.

The implementation of TEDs has significantly reduced incidental capture and mortality of turtles. Additional measures taken by prawn fisheries (such as longer closed season, smaller sizes of trawl towing warp, increased legal mesh size, abolition of twin trawls, spatial and time-bound closures of activities in sensitive or overexploited areas) are aimed at reducing the impact of trawling on the marine environment in general, but could to some extent reduce the impact on marine turtles specifically (Humphrey and Wilson 2005).

Numbers of sea turtles caught by shrimp trawlers from 2004 to 2006, by main fishing area.

----------2004----------2005----------2006----------2008----------2009
Fishing Area----Alive----Dead----Alive---Dead----Alive---Dead----Alive---Dead----Alive----Dead
------A----------28-------2---------0--------0-------0--------0--------0-------0---------0---------0
------B----------15-------1---------0--------0-------0--------0--------0-------0---------0---------0
------C----------57------ 6---------1--------0-------0--------0--------0-------0---------3---------0
------D----------8--------3---------1--------0-------2--------0--------0-------0---------3---------1

b) Set gill nets

Fishing effort:

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

Perceived Impact:

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

Source:

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: Blue Ventures Conservation has deployed two FADs in the Andavadoaka region by 2004, with 20 more deployments planned. This was done in an effort to reduce fishing impacts on reefs in the region. The current status and success of this project is unknown.

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: There is no data.

e) Longline (shallow or deepset)

Fishing effort:

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

Perceived Impact:

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

Source:

f) Driftnet

Fishing effort:

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

Perceived Impact:

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

Source:

g) Other1 (from 1.4.1): **Harpoon**

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]

Purse seine fishing (tuna)

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

Fisheries industries have been encouraged through their management organization, the GAPCM (Groupement des Aquaculteurs et Pecheurs de Crevettes de Madagascar), to use TEDs in their trawl nets (Wilson and Humphrey 2004; Humphrey and Wilson 2005).

In 2003, a law "Decree No 2003-1101" regulating shrimp trawls coastal fisheries was passed requiring industrial and small-scale shrimp trawlers to utilize BRDs and TEDs.

Training and awareness programs for master fishermen to install and use TEDs were carried out by IFREMER. In 2005 and 2006, there was widespread use of TEDs in the industry, and since 2005, the use of TEDs has been successfully enforced in Madagascar. The shrimp fishery was certified by a delegation from the United States in 2006, enabling them to export shrimp to that country; in 2007 a small amount was exported there.

Following experimental work, TED specifications were developed for inclusion in the regulations. These include: a grid of 81 x 81 cm, distance between the bars of 11 cm, aluminum bars of 12-13 mm (solid) or iron bars of 6-7 mm in diameter. The escape opening with single flap is 66 cm for the longitudinal cuts and 181 cm for the transversal cut. In the case of double flap, the escape opening should be 51 cm for the longitudinal cuts and 142 for the transversal cut.

The same TED specifications were implemented for artisanal boats using engines >50hp; for <50hp engines - these TEDs can't be used, so alternatives are being looked at. A suggestion for this problem in the United States is to reduce trawl duration to increase turtle survival.

- It is unlikely that TEDs will increase fuel consumption (maybe by 1%). They may in fact reduce it (due to water escape through the grid, reduced resistance, less clogging of codend). Note that the codend only accounts for 6-7% of total drag, the rest is due to the doors, warps etc and the catch.

- TED use in Madagascar was driven by a close collaboration between industry, the fisheries administration and conservation agencies.

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

☐ YES ☐ NO ■ **NOT APPLICABLE**

At an international level

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

☐ YES ☐ NO ☐ NOT APPLICABLE

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

■ **YES** ☐ NO ☐ NOT APPLICABLE

Deployed FADs are monitored by Blue Venture Conservation (UK NGO).

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

Prawn fisheries are limited by spatial and time bound closures (Humphrey and Wilson 2005).
Shrimp fisheries closure: 1 December to 28 February
Lobsters: 1 October - 31 december

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

A training program for observers was established, including training in TED installation and TED performance inspections. The training includes theory as well as practical sessions; 18 observers have been trained so far. Observers are present in approximately 30% of all trips. The intensity of inspections is higher for the industrial fishery, as compared to the small-scale fishery. The number of inspections has increased since 2005. The actual number of observers on board was 29 on available vessels.

Vessel monitoring systems

■ **YES** ☐ NO ☐ NOT APPLICABLE

Fisheries industries have been encouraged through their management organization, the GAPCM (Groupement des Aquaculteurs et Pecheurs de Crevettes de Madagascar), to use TEDs in their trawl nets since 2000.

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

■ **YES** ☐ NO ☐ NOT APPLICABLE

Port facilities are used for the disposal of ship-borne waste, but in only in the most important ports (Toamasina and perhaps Mahajanga).

Training programmes / workshops to educate fishers

■ **YES** ☐ NO ☐ NOT APPLICABLE

In the framework of the implementation of TEDs by the fishing industry a training program was conducted with the industry contribution to TED development and implementation. The first step was to select the right type of TED in relation to the local trawl design; this was undertaken by means of international consultation and with the assistance of IFREMER. Subsequently, sea trials were carried out. Finally, there was an implementation phase, including the training of crews and fisheries administration personnel. Crews were also trained to monitor and tag turtles caught as by-catch (Wilson and Humphrey 2004).

Last workshop conducted in Toliara (Southwest) "Recherche d'une meilleure approche en vue de l'application effective de la legislation des peches pour une gestion durable des ressources halieutiques (including marine turtles) from 13-14 August 2009.

Informative videos, brochures, printed guidelines etc.

■ **YES** ☐ NO ☐ NOT APPLICABLE

Other (list and explain):

☐ YES ☐ NO ☐ NOT APPLICABLE

☐ **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

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]

Research was conducted to determine the most appropriate specifications for TEDs to be used by prawn trawlers. A study was conducted to determine fishing gear impacts and energy consumption by TEDs (Humphrey and Wilson 2005).

Review and evaluate periodically the application of TED, in 2009.

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

An FAO workshop was convened to share experiences in implementation of TEDs and of other management solutions to reduce sea turtle mortality in shrimp trawl fisheries. Five countries from the SWIO region participated, as well as representatives of other regions where shrimp trawl fisheries are important such as USA, Nigeria and SEAFDEC. This particular venue had been selected because Madagascar has successfully implemented TEDs and representatives from the industry and fisheries department of this country could share their experiences with the other countries. In addition to presentations summarizing experiences in TED implementation, the workshop also included practical demonstrations of how to mount TEDs, as well as testing of their performance during fishing operations. Participation of the industry in this activity, in addition to representatives of fisheries administrations and research institutes, proved to be instrumental for the success of the workshop.

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]

The Government of Madagascar does not allow the use of large-scale driftnets within national waters. In addition, permits are not given to foreign vessels wishing to fish in the Malagasy EEZ using this fishing technique.

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

(1) Arrete of 23 May 1923 protecting places of importance to marine turtles

(2) Arrete of 24 October 1923 prohibiting the capture of the marine turtles in a state of laying-forbidding the harvest of nesting females and of individuals with carapace length greater than 50 cm. In the same year, various nesting sites were declared protected areas. These first laws were followed by additional regulations that lead to total direct prohibition of harvest and utilization of sea turtles

(3) Decree 88-243 of 1988 protecting the Leatherback turtle, *Dermochelys coriacea*, and the other species of marine turtles.

(4) Madagascar also signed the CITES convention in 1975. (Ordinance No 75-04 of August 05, 1975)

(5) Decree no 2006 - 097 of January 31, 2006, lays down the modes of enforcement of the law on international trade of the species of wild fauna and flora.

(6) Decree no 2006-400 of June 13, 2006 concerns the classification of species of wild fauna of Madagascar into three categories: protected, harmful and game.

- Category I: Protected species the species are divided into two classes. Species of class I:

---- the species of class I profit from absolute protection on all the territory of the Republic. Hunting, the capture, detention, the consumption and the marketing of the species of fauna belonging to this class are strictly prohibited in any form. However the capture and the export of the species of this class within the framework are authorized in come cases: research and scientific exchanges; reproduction in captivity or exposure; in accordance with the provisions which apply in these cases to the species of Appendices I and II of CITES.

---- Species of class II: The species of class II can give rise to the issuance of permits for hunting or capture. The quota of collection for each species of this class is fixed by the management authority of CITES on the proposal of the scientific authority.

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

Egg consumption

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

Shell products

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

Fat consumption

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

Traditional medicine

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

Eco-tourism programmes

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

Cultural / traditional significance

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

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:

Hughes 1973; Frazier 1980; Rakotonirina and Cooke 1994; Walker et al. 2004; Walker and Roberts 2005; Metcalf et al. 2007; point source data from NGOs (e.g. Reed Doctor, in Ifaty; Blue Ventures Conservation, in Andavadoaka).

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

■ **YES** ☐ NO ☐ UNKNOWN

Local and regional activities by NGOs and research projects in the southeast (Taolagnaro) and southwest (Toliara) coast. In Maintirano (west-coast), protection of hatcheries areas.

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

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
Study of environmental Impact	
Education / awareness programmes	
■ **YES** ☐ NO ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
Egg relocation / hatcheries	
☐ YES ■ **NO** ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
Predator control	
☐ YES ■ **NO** ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
Vehicle / access restrictions	
☐ YES ■ **NO** ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
Removal of debris / clean-up	
■ **YES** ☐ NO ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
The project team in Taolagnaro (Fanomena project) started working in 2001-2002. Some villages (Antsotso and Sainte Luce) have had community agreements in place since 2000 and 2001.	
Re-vegetation of frontal dunes	
■ **YES** ☐ NO ☐ N/A	☐ EXCELLENT ☐ GOOD ☐ LOW ☐ UNKNOWN
North and south of Toliara, during the Environmental Program Phase 2 (1997 - 2001) by the EMC (Environnement Marin Cotier) component. No information is available on effectiveness of these actions.	
Building location / design regulations	

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

There are general regulations regarding the location of buildings on the coastline, but they seem not to be well enforced. Development of tourism on the coast and particularly in the many small islands that surround Madagascar needs special regulations on location and design of buildings and use of artificial lighting on the beach.

Light pollution reduction

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

Other (list and rate them)

■ **YES** ☐ NO ☐ N/A

Fanomena project activities in Taolanaro (SE); IHSM (University of Toliara) program on marine turtles in the Toliara region

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

■ **YES** ☐ NO ☐ NOT APPLICABLE

Berthin studies titled:"Programmes de gestions des plages et de nidifications des tortues"

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]

Nothing, except project activities. There is a program for the protection of mangroves in Nosy-Be implemented by the EMC component of Environmental Program Phase 2 (1997-2001). Program continued by SAGE (Service d'Appui pour la Gestion de l'Environnement) and extended in Ambaro region (North-west coasts).

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

Only observations by project teams in Taolanaro (SE) and Toliara (SW).

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

Not on a routine basis.

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

■ YES ☐ NO ☐ NOT APPLICABLE

Inspections of local fisheries administration, and missions of agents from the Centre de Surveillance des Peches (CSP).

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)

There have been efforts to alleviate the fishing pressure on reefs in Andavadoaka, in the south-west, by deploying FADs, by Blue Ventures (UK NGO). The FADs appear to attract large numbers of reef and pelagic fish, which would render these structures good alternative fishing areas.

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)

There is a program for the protection of mangroves in Nosy-Be implemented by the EMC component of Environmental Program Phase 2 (1997-2001).

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]

Abreu-Grobois, F.A., Briseno-Duenas, M.R., Sarti, L. 2000. Proceedings of the Eighteenth International Sea Turtle Symposium. 1-29 p.

Anon 2004. Conservation of coastal and marine biodiversity in the Western Indian Ocean: Progress in the development of a partnership programme for implementing the Jakarta Mandate. 1-32 p.

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.

Durbin, J., Rakotoniana, L.J. 1991. Project Angonoka, local people and conservation in the Soalala Region.

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. 1991. The biology and conservation of marine turtles in the Indian Ocean. 364-386 p. In: Daniel, J.C., Serrao, J.S. (Eds.), Conservation in Developing Countries: Problems and Prospects. Proceedings of the Centenary Seminar of the Bomban Natural History Society. 364-386 p. Oxford University Press & Bombay Natural History Society, 364-386 p.

Hughes, G. R. 1969. Report to the Survival Service Commission on marine turtles in southern Africa. Proceedings of the Working Meeting of Marine Turtle Specialists 56-66 p.

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.

Hughes, G. R. 1974. The sea turtles of south east Africa. 200pp.

Hughes, G. R. 1976. Sea turtles in south east Africa. Proceedings of a symposium on endangered wildlife in southern Africa. 81-87 p.

Hughes, G.R. 1970. Preliminary report to the Southern African Wildlife Foundation (World Wildlife Fund) on the status of sea turtles in south east Africa. Section 2: Madagascar and the Mascarene. 1-47 p.

Hughes, G.R. 1972. Report to the Southern Africa Wildlife Foundation (WWF) on the status of the marine turtles in South East Africa. Section 2: Madagascar and the Mascarene. Part 5: The proposed Maheboug Green Turtle Farm.

Hughes, G.R. 1973. The survival situation of the Hawksbill sea-turtle (Eretmochelys imbricata) in Madagascar. Biological Conservation 5: 114-118.

Hughes, G.R. 1974. The sea turtles of South-East Africa I. Status, morphology and distributions. 1-144 p. The Oceanographic Research Institute, Durban. 1-144 p.

Hughes, G.R. 1980. Sea turtles: a guide. Natal Parks Board, Pietermaritzburg. pp. 1-25.

Humphrey, S., Jimenez, S. 2007. Bulletin de la tortue marine: Les dernieres nouvelles du Programme du WWF pour la conservation des tirtues marines en Afrique et Madagascar. Numero 3. 1-16 p.

Humphrey, S., Wilson, A. 2005. Marine turtle update: Recent news from the WWF Africa and Madagascar Marine Turtle Programme. 1-18 p.

Kemf, E., Groombridge, B., Abreu, A., Wilson, A. 2000. Marine turtles in the wild. 2000 - A WWF species status report. WWF, Gland, Switzerland.

Leroux, G. 2007. Tortues Marines: L'Espoir en Marche. Univers Maor 8: 32-43.

Lilette, V. 2006. Mixed results: Conservation of the marine turtle and the red-tailed tropicbird by Vezo semi-nomadic fishers. Conservation and Society 4: 262-286.

Luschi, P., Hughes, G.R., Mencacci, R., De Bernardi, E., Sale, A., Broker, R., Bouwer, M., Papi, F. 2003. Satellite tracking of migrating loggerhead sea turtles (Caretta caretta) displaced in the open sea. Marine Biology 143: 793-801.

Metcalf, J.D., Hampson, K., Andriamizava, A., Andrianirina, R., Cairnes, T., Gray, A., Ramiarisoa, C., Sondotra, H. 2007. The importance of north-west Madagascar for marine turtle conservation. Oryx 41: 232-238.

Metcalf, J.D., Rafaeliarisoa, C., Gray, A., Sondrotra, H., Cairnes, T., Andrianirina, R., Hampson, K., Andriamizava, A. 2000. Rapport de la mission - Nosy Hara - Radama Expedition. Unpublished Report.

Rafaeliarisoa, C. 2009. Les tortues marines de Nosy Iranja: Etudes bio-eligiques de la ponte et enques socio-enomiques dans le Nord Ouest de Madagascar. Rapport preminaire.

Rakotonirina, B.P. 1987. Les tortues marines dans le sud de Madagascar: Etude bibliographique et enquetes aupres des pecheurs. Reserche sur la biometrie et l'alimentation de la tourtue verte, Chelonia mydas Linnaues. Memoire de DEA d'Oceanographie Appliquee, Universite de Toliara.

Rakotonirina, B.P. 1989. Exploitation des tortues marines a Madagascar. Western Indian Ocean Journal of Marine Science 4: 219-225.

Rakotonirina, B.P. 1998. Etude preminairedes tortues marines dans la presqu's de Masoala (Nord-Est de Madagascar).

Rakotonirina, B.P., Cooke, A. 1994. Sea turtles of Madagascar: Their status, exploitation and conservation. Oryx 28: 51-61.

Ramamonjisoa, V.C. 1997. Etude de l'exploitation des tortues marines dans le Nord de Tolagnaro en vue de leur conservation. Report for Meir Certificat d'Aptgitude Pegogique de l'Ecole Normale, Antananarivo.

Ratsimbazafy, R. 2003. Sea turtles In: Goodman, S.M., Benstead, J.P. (Eds.), The natural history of Madagascar. The University of Chigaco Press.

Sagar, J. 2001. The ecology and conservation of sea turtles in the Nosy Be Islands, Madagascar. Soafiavy, B. 2000. Etude des populations de tortues marines dans la reon de Tolagnaro (Fort-Daupin): Biologie-ecologie- menaces. Dipl - d'Etudes Approfondies, Institut Halieutique et des Sciences MArines de l'Universite Toliara. pp.

Walker, R.C.J., Roberts, E., Fanning, E. 2004. The trade of marine turtles in the Toliara region, South West Madagascar. Marine Turtle Newsletter 106: 7-10.

Wamukoys, G. M. and Salm, R. V. 1998. Report of the Western Indian Ocean turtle excluder device (TED) training workshop. 1-36 p.

Wilson, A., Humphrey, S. 2004. Marine turtle update: Recent news from the WWF Africa and Madagascar Marine Turtle Programme. 1-16 p.

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

- Miamby Fano (Programme of Reef Doctor, NGO) in Itaty, is developing a permanent
- Monitoring and education programme in the Bay of Ranobe, south-west Madagascar.
- Blue Ventures Conservation is monitoring nesting beaches in the Velondriake community-managed marine protected area in south-west Madagascar.

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

☐ YES ■ **NO** ☐ UNSURE

Samples have been taken by the project but no results are known, as yet (Bourjea J unpublished data).

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

The WWF Marine Program in Nosy Iranja conducted some tagging experiments. Turtles caught as by-catch by prawn trawlers waere also tagged, in a WWF initiative (Wilson and Humphrey 2004).

Satellite tracking ☐ YES ■ **NO**

☐ **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

Only biological observations. WWF, in collaboration with the Malagasy Shrimp Fishing and Farming Association (GAPCM) initiated (in 2003) a programme that involved industrial shrimp trawl fisheries (Wilson and Humphrey 2004; Humphrey and Wilson 2005). The programme entailed tagging and monitoring of marine turtle bycatch. This included an assessment of the survival rates of incidentally caught turtles and how it is influenced by the use of TEDs.

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

☐ YES ■ **NO** ☐ UNSURE

Not yet

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

■ **YES** ☐ NO ☐ UNSURE

- Research by Berthin Rakotonirina in Toliara;
- Interviewing fishermen in Nosy-Bend and Nosy Iranja (NW) by project team to collect information on marine turtle populations;
- Hughes (1973), Walker and Roberts (2005) and NGOs (Blue Venture Conservation, Reef Doctor) gathered information from local people and used information obtained from local people in south-west Madagascar

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]

Not yet, only local and national.

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

Observations and samples taken for analysis are in progress outside country (United Kingdom)

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

Report from project (by NGOs - like Azafady, WWF-Madagascar, WCS-Madagascar)

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

Data from tagging experiments

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

Reports by various studies (students and scientists from outside the country). These include studies conducted under KELONIA, IFREMER and CEDTM (La Reunion). The Graduate Institute of Development Studies (IUED, Switzerland), the Geneva Natural History Museum (Switzerland).

☐ **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]

Loggerhead population in SE - drastic decline
Green turtle population in SW (Toliara) - traditional harvest
Leatherback population in SE (Taolanaro) - traditional fishery and egg harvest
Hawksbill population in NW (Nosy-Bend Nosy Hara) - traditional fishery and egg harvest

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]

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

- The WCS-Madagascar marine program and the WWF-Madagascar marine program are exchanging information. This has led to the use of some standardized methods on nesting beaches and threats to marine turtles.
- Capricorn Coastal Alliance has been established to coordinate the conservation and research efforts of individual governmental and non-organisations (IHSM - Institut Halieutique et des Sciences Marines, COUT - Cellule des Oceanographes de l'Universite de Toliara, RESOLVE, Reef Doctor, Blue Ventures Conservation, Frontier Madagascar).

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]

- Scientific and technical reports
- Papers (publications) presented at regional and international workshops

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**

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]

Questionnaires for fishermen and local communities
Community meeting
Identification sheets for village volunteers
WWF marine turtle program to be confirmed

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

Project activities focused on local communities and especially traditional fishing communities and schools (not often)
Project team visit to local authorities

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

■ **YES** ☐ NO

Fanomena project; village information center at Antsotso (SW)

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.

Project in Taolanaro (SE) ecotourism visit;
Tourism activity in SE and E (Masoala and Sainte Marie island);
Conservation activities within tourism program (Sainte Marie Island)

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]

Elaboration of PCD (Plan Communal de Developpement)

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]

WWF-Marine Turtle program
Azafady (NGO) project in Taolanaro (SE)
CSP (Centre de Surveillance des Peches) observation program
Task group on marine turtle: research (CNRE- IHSM)
Fisheries Administration (Direction des Peches), NGO's (WCS, WWF)

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

CITES was ratified by Madagascar through Ordinance no. 75-014 of 15 August 1975 and the Convention took effect 18 November 1976.

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

Customs service at airports and ports in cooperation with officials from Waters and Forest administration

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]

None

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]

None

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**

No sub-regional plan, no national plan (officially). To be done shortly.

Existing plans that could be considered as possible models are:

Fanomena project recommendations
WWF - marine turtle conclusion and recommendations

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]

1.2 a) Identify and document best practice protocols for conserving and managing marine turtle populations within the region

1.3 a) Conduct socio-economic studies among communities that interact with marine turtles and their habitats

1.5 a) Enact, where not already in place, legislation to prohibit direct harvest and domestic trade

1.5 b) Assess the level and impact of traditional harvest on marine turtles and their eggs

2.1 b) Designate and manage protected/conservation areas, sanctuaries or temporary exclusion zones in areas of critical habitat, or take other measures (e.g. modification of fishing gear, restrictions on vessel traffic) to remove threats to such areas

2.1 e) Manage and regulate within each jurisdiction the use of beaches and coastal dunes, for example location and design of buildings, use of artificial lighting, and transit of vehicles in nesting areas

3.1 b) Initiate and/or continue long-term monitoring of priority marine turtle populations in order to assess conservation status

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 practice approaches to conservation of marine turtles and their habitats

4.1 d) Develop and conduct focused education and awareness programmes for target groups (e.g. policy makers, teachers, schools, fishing communities, media)

5.5 a) Review domestic policies and laws to address gaps or impediments to marine turtle conservation

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

Tagging
Satellite follow up
Training of project teams and community
Facilities for research and management to enforce communities agreements.
Develop socio-economic activities (alternatives to traditional harvest)

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]

Scientist mobility
Sub-regional workshop
Exchange of experiences in local communities

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]

Centre de Surveillance des Peches (CSP) program with on-board observers
Support of industrial experiences on use of TED with shrimp trawlers

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]

Awareness of policy makers, local communities, fishermen
Training of volunteers from project and communities
Training of students and researchers
Facilities for long-term programme

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]

Local workshop (Taolanaro) for communities
Community meetings by Fanomena project
In Toliara, by University (Institut Halieutique et des Sciences Marines - IHSM)
Regional workshops were conducted in 1996 and 2000 at La Reunion
Enforcement of the training on the use of TED on shrimps vessels

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]

WWF Marine Turtle program works with Universities of Antananarivo and Toliara, providing opportunities for students to carry out research.

WCS Marine turtle programme

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]

This needs a national consultation and compilation of environmental actions that have been applied.

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

Office National pour l'Environnement (ONE) developed a proposal to address gaps in laws on marine turtle protection, but no results as yet.

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**

No data available

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]

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]

Nothing done

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

Project Fanomena Activities with donations from United Kingdom

WWF - Madagascar (WCS and WWF Madagascar are cooperating in marine turtle conservation and management activities)

Shrimp fishery societies contribute by tagging turtles captured by their trawlers (E)

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

Project Fanomena in Taolanaro (SE) uses volunteers from villages in piloting ecotourism through managed visits

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**

CNRE has been the national institute of environmental research and coordinate national data on marine turtle activities.

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

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

Government structures have changed so many times during the period.
The review is expected to be done in May- June 2004

Comments / suggestions to improve the present reporting format:

Additional information not covered above: