Madagascar

GENERAL INFORMATION

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Cétamada-Pour la conservation des mammifères marins et de leur habitat à Madagsacar;
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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).

UPDATE (2014):
The green turtle is the most common nesting species in these northern coastal areas, while the hawksbill turtle is observed only in a few places along the Northwestern beaches: Nosy Hao and Nosy Vaha in the Nosy Hara Marine Park, and Nosy Nosy Mangiho and Mitsio in the Ambilobe Bay. The peak nesting season is during the months of May and June, with the exception of the Ambilobe Bay, where the nesting season is most important in the beginning of March.
The area that includes Ambilobe and Vohémar is important for marine turtle species; beaches on offshore islets are important nesting sites for marine turtles, where the four nesting species occur: the green turtle (*Chelonia mydas*), the hawksbill turtle (*Eretmochelys imbricata*), the loggerhead turtle (*Caretta caretta*) and the olive ridley turtle (*Lepidochelys olivacea*).

La zone d'Ambilobe et Vohémar est importante pour les espèces de tortues marines; les plages des îlots au large constituent des sites de nidification importants pour les tortues marines où l'on y rencontre les 4 espèces nidifiantes: la tortue verte (Chelonia mydas), la tortue imbriquée (Eretmochelys imbricata), la tortue caouanne (Caretta caretta) et la tortue olivâtre (Lepidochelys olivacea).
La tortue verte est l'espèce la plus commune nidifiant dans ces zones côtières du Nord; la tortue imbriquée est seulement observée sur quelques sites le long des plages du Nord-ouest: Nosy Hao et Nosy Vaha dans le Parc marin de Nosy Hara et Nosy Mangiho et Nosy Mitsio dans la Baie d'Ambilobe. Le pic de la saison de nidification est durant les mois de Mai et Juin à l'exception de la Baie d'Ambilobe où la saison de nidification est importante au début du mois de mars.

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).

UPDATE (2014):

• In the area of Moramba Bay, where illegal trade of marine turtles seems to have intensified between 2011 and 2012, the Cétamada NGO, with the help of local hotel staff, has set up a system of conservation incentives by assigning a reward of 200 000 Ar (~ 100 USD) per nest found and protected;
• Moreover, encouragement for local hotel staff to complain to authorities (Gendarmerie, the police force) when a smuggler is caught in the act appears to be effective in reducing this threat.

• Dans la zone de la baie de Moramba où le trafic des tortues marines semble s'être intensifié entre 2011 et 2012, l'ONG Cétamada, avec l'aide des hôteliers locaux, a mis en place un système d'incitation à la conservation en attribuant une récompense de 200 000 Ar (~100 USD) par nid trouvé et protégé;
• Par ailleurs, l'encouragement des hôteliers locaux à porter plainte auprès des autorités (Gendarmerie) lorsqu'un trafiquant est surpris en flagrant délit semble être efficace pour réduire cette menace.

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.

UPDATE (2014):

• In December 2012, a socio-economic study by Cétamada and the Department of Animal Biology (Faculty of Sciences, University of Antananarivo), conducted in the fishing villages from the area of Moramba Bay (villages of Moramba, Marokibay, Marovasa kely, Marovasa be, Anjajavy) (Northwest). It confirmed the habit of green turtle hunting by the villagers of Marovasa Be and Marokibay. A nest was found and monitored on the beach of Anjajavy. This study identified two types of marine turtle exploitation: local consumption and organized illegal trade across the region by collectors from Mahajanga.
A new illegal marine turtle trade network recently set up by traders from the city of Mahajanga was uncovered in the various bays of Northwest Madagascar (Baly to Moramba) in 2012.
See corresponding map: http://bit.ly/1z1jgOZ
• En décembre 2012, une etude socio-économique menée par Cétamada et le Département de Biologie Animale (Fac Sciences Antananarivo) dans les villages de pêcheurs de la région de Baie de Moramba (villages de Moramba, Marokibay, Marovasa kely, Marovasa be, Anjajavy) (Nord-ouest). Cette etude a permis de confirmer la présence de tortue verte chassée par les villageois de Marovasa Be et de Marokibay. Un nid a été trouvé et suivi sur la plage d'Anjajavy. L'etude a permis de distinguer deux types d'exploitation des tortues marines: une consommation locale et un trafic organisé à l'échelle de la Région par des collecteurs venant de Mahajanga.
Un trafic de tortue marine nouvellement mis en place par des commerçants venant de la ville de Mahajanga a été découvert dans les différentes baies du nord-ouest (de Baly à Moramba) en 2012.
Voir carte correspondante: http://bit.ly/1z1jgOZ.

• Marine turtle monitoring and surveying missions were conducted from January 2010 to September 2012, as part of the wetland monitoring programme in the Baly Bay (Boeny Region, northwest of Madagascar). These activities helped to confirm the presence of *Chelonia mydas* and *Eretmochelys imbricata* around the bay, as well as the exploitation of these species by populations in the villages of Amparafaka, Anjiamaloto, Ampapamena, Marotia, Antranolava, Baly. Geographic coordinates of sites around Baly Bay are given on the following link: http://bit.ly/1nXd57e.
The presence of fisher-farmers periodically engaging in turtle fishing / hunting has been confirmed.
• Des missions d'observation et d'enquête sur les tortues marines ont été réalisées de janvier 2010 à septembre 2012, dans le cadre du suivi environnemental des zones humides de la baie de Baly (Région de Boeny, nord-ouest de Madagascar). Elles ont permis de mettre en évidence la présence de Chelonia mydas et d'Eretmochelys imbricata, autour de la baie, ainsi que l'exploitation de ces espèces par les populations des villages de Amparafaka, Anjiamaloto, Ampapamena, Marotia, Antranolava, Baly.
Voir les coordonnées géographiques des sites autour de la baie de Baly: http://bit.ly/1nXd57e
La présence de pêcheur-paysans s'adonnant périodiquement à la pêche/chasse de tortue marine a été confirmée.

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.

UPDATE (2014):
A new marine turtle smuggling network has emerged, whereby isolated fishing villages located in the western and northwestern bays (Mahajanga coast) supply traders established in Mahajanga; but the final destination of the products is often unknown (see Cétamada Report, 2013).
Il existe une nouvelle filière sur le trafic illicite des tortues marines dont le point de départ sont les villages de pêche isolés dans les baies de la côte ouest et nord-ouest (Mahajanga) et le point de sortie des commerçants installés à Mahajanga ; mais la destination finale des produits est souvent inconnue (Cf. Rapport Cétamada, 2013).

Ease of access:

UPDATE (2014):
Marine turtle fishing / hunting, initially accidental only, has become a source of income for the small-scale fishermen.
La pêche / chasse à la tortue, au départ accidentelle, est devenue une activité source de revenus pour les petits pêcheurs.

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).

Other 1:

UPDATE (2014):
In the absence of any active strategy against illegal harvesting, fishermen and collectors do not feel threatened.
En l'absence d'une stratégie de lutte active, les pêcheurs et collecteurs ne se sentent pas menacés.

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.

UPDATE (2014):

• Under the initiative of the "Ecosystem" Thematic Group of the National Committee on Integrated Coastal Zone Management (French acronym CNGIZC), a national workshop was held in November 2013 at the Prime Minister level to: (i) reach a common understanding (by the various concerned ministries) of existing texts on the protection of marine turtles; (ii) take stock of the current state of threats to marine turtles; and (iii) develop urgent measures to eradicate the local sale of marine turtles throughout the entire Malagasy territory.
• Longer-term actions have also been proposed, such as:
-- Validating the draft National Action Plan for the Conservation of Marine Turtles, taking into account the existence of traditional rites, the conventions ratified by Madagascar (Convention on the Conservation of Migratory Species, Nairobi Convention, ...);
-- Seeking funds to implement activities listed in this National Action Plan;
-- And updating decrees to facilitate the implementation of existing texts.

• Sous l'initiative du Groupe Thématique "Ecosystème" du Comité National sur la Gestion Intégrée des Zones Côtières (CNGIZC), un atelier national a été organisé en novembre 2013 au niveau de la Primature pour: (i) arriver à une compréhension commune (par les divers ministères concernés) des textes existant sur la protection des tortues marines; (ii) dresser l'état actuel de la menace sur les tortues marines; et (iii) mettre au point des mesures urgentes afin d'éradiquer la vente locale des tortues marines sur tout le territoire malgache.

• Des actions à plus long terme ont aussi été proposées, comme :
-- La validation de l'ébauche du Plan d'Action National pour la Conservation des Tortues Marines tout en considérant les rites traditionnels, les conventions ratifiées par le Madagascar (Convention for Migratory Species, Convention de Nairobi,…);
-- La recherche de financement pour la mise en œuvre des activités inscrites dans ce Plan d'Action National;
-- Et la mise à jour des décrets d'application des textes existants.

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.

UPDATE (2014):
The shrimp fishing industry currently includes 70 vessels operating on the entire West coast as well as in Antongil Bay (East coast). The use of TEDs is mandatory for all trawling vessels.
La pêche industrielle crevettière utilise actuellement 70 bateaux qui opèrent sur l'ensemble de la côte ouest et la baie d'Antongil (côte Est). L'utilisation de TEDs sur tous les chaluts est obligatoire.

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).

UPDATE (2014):
Fishermen in the Baly and Moramba bays use large mesh gill nets called " GTZ nets" (popularized by a GTZ project to develop artisanal fisheries in the region of Nosy Be), to fish large coastal necto-benthic species such as Carangidae and Scombridae.
Les pêcheurs de la baie de Baly et de la baie de Moramba utilisent des filets maillants à grande maille appelé « filet GTZ » (vulgarisé par un projet GTZ de développement de la pêche artisanale dans la région de Nosy-Be), pour la pêche des gros necto-benthiques côtiers comme les Carangidés et Scombridés.

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.

UPDATE (2014):
Under the regional SWIOFP project, tests on FADs were carried out by the Fisheries and Marine Sciences Institute (French acronym IHSM) in Toliara (Southwest Madagascar), under the PACP project (Project to Support Fishing Communities of the Tuléar region).
Dans le cadre du projet régional SWIOFP, des essais de DCP ont été réalisés par l'Institut Halieutique et des Sciences Marines (IHSM) à Toliara (Sud-ouest de Madagascar) dans le cadre du projet PACP (Projet d'Appui aux Communautés de Pêcheurs de la région de Tuléar).

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):

UPDATE (2014):
Asian fishing boats often visit Malagasy waters, but data are not available.
Des bateaux de pêche asiatiques fréquentent souvent les eaux malagasy mais les données ne sont pas disponibles.

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

UPDATE (2014):
Deployed FADs are monitored by IHSM (Toliara) and Blue Venture Conservation (Andavadoaka).

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

UPDATE (2014):
Periods of annual closure of shrimp fishing are applied to all sub-sectors (industrial, artisanal and traditional). These periods

are defined each year by the Ministry responsible for fisheries resources, in consultation with the GAPCM.
Des périodes de fermeture annuelle de la pêche crevettière sont appliquées pour tous les sous-secteurs (industriel, artisanal et traditionnel). Ces périodes sont définies chaque année par le ministère chargé des ressources halieutiques, en concertation avec le GAPCM.

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.

UPDATE (2014):
The Fisheries Monitoring Centre (French acronym CSP) carries out an observer program on all foreign fishing vessels operating in national waters, as well as routine monitoring on domestic shrimp fishing vessels.
Le Centre de Surveillance des Pêches (CSP) réalise un programme d'observation sur tous les bateaux de pêche étrangers travaillant dans les eaux nationales et un suivi routinier sur les crevettiers nationaux.

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.

UPDATE (2014):
Monitoring programme of the CSP.
Programme de suivi du CSP.

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.

UPDATE (2014):
Various NGOs are organising training for fishermen in their area of intervention (Cétamada, Blue Ventures, WWF, C3).
Différentes ONG font des actions de formations des pêcheurs dans leur zone d'intervention (Cétamada, Blue Ventures, WWF, C3).

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.

UPDATE (2014):

No specific research activity carried out for the time being.
Pas d'activité de recherché spécifique pour le moment.

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.

UPDATE (2014):
- Law No. 2005-018 on the international trade in wild fauna and flora species;
- Ordinance No. 93-022 regulating fishing and aquaculture activities;
- Decree No. 2006-098 publishing the revised CITES appendices.
- Loi n° 2005‐018 sur le commerce international des espèces de faune et de flore sauvages;
- Ordonnance n° 93-022 portant réglementation de la pêche et de l'aquaculture;
- Décret n°2006-098 portant publication des annexes révisées de la Convention CITES.

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.

UPDATE (2014):
No, but a regional order (Southwest Region) governs the preservation, the protection and the fight against illicit trafficking of marine turtles in the region. (Regional Order No. 2013-009 / REG / ATSIMO ANDREFANA concerning preservation of endangered turtles in the region).
Non, mais un arrêté régional (Région Sud-Ouest) régit la sauvegarde, la protection et la lutte contre le trafic illicite des tortues marines de la région. (Arrêté régional n°2013 – 009 /REG/ATSIMO ANDREFANA portant préservation des tortues menacées d'extinction dans la Région).

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**

UPDATE (2014):
Environmental Impact Assesment for offshore and inshore prospection and Environmental Monitoring done by Aquamen and Aqualma (2010-2012).

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"

UPDATE (2014):
Raynaud, O. 2012. Island life: monitoring nesting turtles in the Barren Isles. Blue Ventures blog. Available at http://blog.blueventures.org/island-life-monitoring-nesting-turtles-in-the-barren-isle/

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).

UPDATE (2014):
All environmental impact assessment on marine and coastal developement project include marine turtles species and habitats.

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.

UPDATE (2014):
Some experiments have been done by Reef doctor and Blue Ventures.

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.

UPDATE (2014):

Taylor V. & Poonian C. in prep. Northern Madagascar – a priority nesting region for endangered marine turtles under severe anthropogenic pressure.

Hartshorn J. 2012. Conservation in developing countries a Nosy Hara National Marine Park case study: socioeconomic conditions and co-management structures that affect conservation sustainability in Nosy Hara National Marine Park. Internship Report to University of Miami.

Jones, B. 2012. Lôlô in the limelight at the fano (turtle) festival in Andranopasy. Blue Ventures blog. Available at http://blog.blueventures.org/lolo-limelight-fano-festival-andranopasy/

Cough, C. 2011. Talking about turtles. Blue Ventures blog. Available at http://blog.blueventures.org/talking-turtles/

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.

UPDATE (2014):

No long-term monitoring programme.

UPDATE (2014):

• Marine turtle monitoring and surveying missions were conducted from January 2010 to September 2012, as part of the wetland monitoring programme in the Baly Bay (Boeny Region, northwest of Madagascar). These activities helped to confirm the presence of *Chelonia mydas* and *Eretmochelys imbricata* around the bay, as well as the exploitation of these species by populations in the villages of Amparafaka, Anjiamaloto, Ampapamena, Marotia, Antranolava, Baly. Geographic coordinates of sites around Baly Bay are given on the following link: http://bit.ly/1nXd57e.
The presence of fisher-farmers periodically engaging in turtle fishing / hunting has been confirmed.
• Des missions d'observation et d'enquête sur les tortues marines ont été réalisées de janvier 2010 à septembre 2012, dans le cadre du suivi environnemental des zones humides de la baie de Baly (Région de Boeny, nord-ouest de Madagascar). Elles ont permis de mettre en évidence la présence de Chelonia mydas et d'Eretmochelys imbricata, autour de la baie, ainsi que l'exploitation de ces espèces par les populations des villages de Amparafaka, Anjiamaloto, Ampapamena, Marotia, Antranolava, Baly.
Voir les coordonnées géographiques des sites autour de la baie de Baly: http://bit.ly/1nXd57e
La présence de pêcheur-paysans s'adonnant périodiquement à la pêche/chasse de tortue marine a été confirmée.

• In March 2012, an expert mission on the status of marine turtles in the new marine protected areas of Mitsio-Tsarabanjina (or Ankarea NAP) and Nosy Iranja, Ankazoberavina, Russian Bay (or Ankivonjy NAP) in the Northwest of Madagascar was led by a member of Kelonia (NGO based in La Réunion). This study enabled observation of nesting on two beaches of Grande Mitsio, Ankaran and Andatsatsa, as well as on the island of Tsarabanjina. On sites of Nosy Iranja, Maratony, Ampohara and Ankazoberavina, the reproduction monitoring programme led by local hotel staff has been confirmed, and observations of phanerogame seabeds allowed identification of the species present as well as their use of the site as a feeding area. Evidence of some poaching was also reported on the northern beach of Iranja Be, but in general the population is respectful of conservation efforts.
• Une mission d'expertise sur la situation des tortues marines dans les nouvelles aires marines protégées de Mitsio-Tsarabanjina (ou NAP Ankarea) et de Nosy-Iranja, Ankazoberavina, Baie des Russes (ou NAP Ankivonjy) dans le nord-ouest de Madagascar, a été effectuée en mars 2012 par un membre de Kelonia (ONG basée à La Réunion). Cette étude a permis d'observer des activités de ponte sur deux plages de la Grande Mitsio, Ankaran et Andatsatsa, et sur l'île de Tsarabanjina. Sur les sites de Nosy-Iranja, Maratony, Ampohara et Ankazoberavina, le programme de suivi de la reproduction mené par les hôteliers locaux a été confirmé et des observations sur les herbiers à phanérogames a permis d'identifier les espèces présentes ainsi que leur utilisation comme aire de nourrissage. Quelques traces de braconnages ont aussi été notées sur la plage Nord d'Iranja Be, mais d'une manière générale la population est sensible aux efforts de conservation.

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.

UPDATE (2014):
• From 2009 to 2014, the "Community Centered Conservation" (C3) NGO has been conducting studies on the conservation of endangered marine species (including turtles), as well as socio-economic and cultural assessments to meet the needs for conservation of coastal zones.
• De 2009 à 2014, l'ONG Conservation Centrée sur la Communauté (C3) mène des études sur la conservation des espèces marines menacée (dont les tortues) et effectue des évaluations socio-économiques et culturelles pour répondre aux besoins de conservation des zones côtières.

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]

UPDATE (2014):
- WWF Madagascar, Cétamada and C3 are conducting monitoring programs and research in the northern region of Madagascar (Nosy Hara Marine Park) in collaboration with regional projects of the Indian Ocean.
- WWF Madagascar, Cétamada et C3 mènent des programmes de suivi et de recherche dans la région nord de Madagascar (Parc marin de Nosy Hara) en collaboration avec des projets régionaux de l'océan indien.

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

UPDATE (2014):

The most threatened by fishing and smuggling outward populations are:
• Green turtles in the area of the Moramba Bay and the Mahajamba Bay;
• Green turtles on the north coast of Toliara;
• Turtles of the southeast region (between Taolagnaro Manakara, and whose status is unknown).
Les populations les plus menacées par la pêche et le trafic illicite vers l'extérieur sont:
• Les tortues vertes de la zone de la Baie de Moramba et la Baie de Mahajamba;
• Les tortues vertes de la côte nord de Toliara,
• Les tortues de la région sud-est (entre Taolagnaro et Manakara, et dont le statut est inconnu).

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]

UPDATE (2014):
Information obtained from newly threatened areas are forwarded to regional authorities and relevant ministries (Environment and Fisheries Resources) to enable them to take specific measures to control and monitor fisheries and trade of turtles and marine turtle products .
Les informations provenant des nouvelles zones menacées sont transmises aux autorités régionales et aux ministères concernés (Environnement et Ressources halieutiques) pour que celles-ci prennent des mesures de contrôle et suivi spécifiques sur la pêche et le commerce des tortues et des produits issus des tortues marines.

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).

UPDATE (2014):
Monitoring and study programmes conducted by various organizations (WWF, Blue Venture, C3, Cétamada) in Madagascar involve scientists from outside and use standard methods.
Les programmes de suivi et d'étude menés par les divers organismes (WWF, Blue Venture, C3, Cétamada) à Madagascar font intervenir des scientifiques venant de l'extérieur et utilisent des méthodes standards.

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.

UPDATE (2014):
The Customs Service and the Water and Forests Administration work in collaboration with regional organizations (SADC, COMESA, IOC) to fight against the illegal trade in sea turtle products.
Le Service des Douanes et l'administration des Eaux et Forêts travaillent en collaboration avec les organismes régionaux (SADEC, COMESA, COI) pour lutter contre le commerce illégal des produits issus des tortues marines.

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]

UPDATE (2014):
None for the moment.
Aucun pour le moment.

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]

UPDATE (2014):

At the initiative of the "Ecosystems" Group within the Integrated Coastal Zone Management National Committee (ICZMNC, French acronym CNGIZC), a national workshop for the protection of sea turtles was held in December 2012 at the Prime Minister level. A reminder on protective measures was distributed by the Prime Minister cabinet to all concerned agencies,

both at national and regional levels; a strategy for implementation of the National Action Plan for the conservation and protection of marine turtles is currently under preparation with the assistance of regional ICZM Committees (west and southwest Regions).

A l'initiative du Groupe « Ecosystème » au sein du Comité National Gestion Intégrée des Zones Côtières (CNGIZC), un atelier national pour la protection des tortues marines a eu lieu en décembre 2012 au niveau de la Primature. Une note de rappel sur les mesures de protection a été distribuée par la Primature à tous les organismes concernés, aussi bien au niveau national que régional ; une stratégie de mise en œuvre du plan d'action national pour la conservation et la protection des tortues marines et en cours de préparation avec le concours des comités régionaux GIZC (Régions ouest et sud-ouest).

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

UPDATE (2014):
This plan (5.1.5.) is being implemented with the support of WWF Madagascar and ICZMNC.
Ce plan (5.1.5.) est en cours de mise en œuvre avec le concours de WWF Madagascar et du CN GIZC

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]

UPDATE (2014):

The following activities and methods are seen as important:
• Scientist mobility;
• Sub-regional workshop;
• Exchange of experiences in Local Communities;
The following organizations can greatly assist in the implementation of conservation measures:

• Committee on the Indian Ocean;
• WWF Indian Ocean (cooperation agreements have been signed with national research organizations such as IHSM and

NWRC).

Les activités et méthodes suivantes sont perçues comme importantes:
• Mobilité des scientifiques;
• Ateliers subrégionaux;
• Echange d'expériences au sein des communautés locales.

Les organisations suivantes peuvent beaucoup aider dans l'application des mesures de conservation: • Commission de l'Océan Indien;
• WWF Océan indien (des conventions de coopération sont signées avec les organismes nationaux de recherche comme IHSM et CNRE).

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.

UPDATE (2014):
- Fisheries regulations require the use of TEDs on all trawlers operating in the waters under national jurisdiction.
- The Fisheries Monitoring Centre includes in its routine monitoring program the capture and illegal trade in marine turtles.
- La réglementation des pêches impose l'utilisation des TED sur tous chalutiers travaillant dans les eaux sous juridiction nationale.
- le Centre de Surveillance des Pêches inclut dans son programme routinier de surveillance la capture et le commerce illicite des tortues marines

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]

Training of volunteers from project and communities
Training of students and researchers

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

UPDATE (2014):

- The "Coastal Academy" programme, organised by C3, trains students from the University of Antsiranana, as well as technicians from various agencies, on the conservation and ecology of coral reefs, mangroves and seagrass beds, as well

as on identification of marine species and monitoring techniques.
- C3 also conducts an outreach project based on the involvement of children and youth in the protection of marine species at the site where C3 is involved. This awareness project takes many forms, such as street theater with endangered species mascots, interactive games with children, presentations and discussions, and the publication of various awareness tools through the press, television, and the Internet (Facebook, Twitter and YouTube).

- le programme 'Coastal Academy' de C3 forme des étudiants de l'université d'Antsiranana et des techniciens de divers organismes sur conservation et écologie de récifs coralliens, de mangroves et d'herbiers marins, identifications d'espèces marines et techniques de suivis.
- C3 effectue aussi un projet de sensibilisation basé sur l'implication des enfants et des jeunes dans la protection des espèces marines dans le site d'intervention de C3. Le projet de sensibilisation revêt plusieurs formes comme le théâtre ambulant avec des mascottes des espèces en danger, jeux interactifs avec les enfants, présentations et discussions, et la publication de différents outils de sensibilisation à travers la presse, la télévision, et l'internet (Facebook, Twitter et YouTube).

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

UPDATE (2014):

- The monitoring and awareness programme conducted by C3 is being carried out in collaboration with the following nationals institutions: University of Antsiranana, National Oceanographic Research Center, and National Center for Environmental Research.
- The programme involving training and monitoring of marine/coastal landscapes of the northern zone, initiated by WWF Madagascar Indian Ocean, is being carried out in collaboration with the National Centre for Research on the Environment.
- The Cétamada NGO is working very closely with the Department of Animal Biology (Faculty of Sciences of Antananarivo) for environmental monitoring and awareness-raising of peasants/fishermen of the northwestern area.

- Le programme de suivi et de sensibilisation de la population mené par C3 est mené de concert avec les institutions nationales: Université d'Antsiranana, Centre National de Recherches Océanographiques et Centre National de Recherche sur l'Environnement.
- Le programme de formation et de suivi des paysages marin-côtiers de la zone Nord, initié par WWF Madagascar Océan Indien, est réalisé en collaboration avec le Centre National de Recherche sur l'Environnement.
- L'Association Cétamada travaille en étroite collaboration avec le Département de Biologie Animale (Faculté des Sciences d'Antananarivo) pour les suivis environnementaux et la sensibilisation des paysans-pêcheurs de la zone Nord-ouest.

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.

UPDATE (2014):
At the national level, legal and regulatory provisions are applied with difficulty, mainly due to a lack of cooperation between different departments; but at the regional (mainly southwest) and local levels, measures (regional orders, Dinas or collective agreements) are being effectively implemented.
Sur le plan national, les dispositions légales et réglementaires sont difficilement appliquées essentiellement à cause de manque de coopération entre les différents départements ministériels ; mais au niveau régional (surtout sud-ouest) et local, les mesures (arrêté régional, Dina ou convention collective) sont bien respectées.

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

UPDATE (2014):

The application of texts is hindered by differences of interpretation between the relevant ministries (environment, fisheries, trade), justifying the December 2013 national workshop. A programme intended to follow up recommendations arising from the workshop was prepared by the National Focal Point, but funding remains to be sought, in the framework of the activities undertaken by the National Committee on Integrated Coastal Zone Management.

L'application des textes se heurte à des différences d'interprétation entre les ministères concernés (environnement, pêche, commerce), d'où l'atelier national de décembre 2013. Un programme de suivi des recommandations de l'atelier est élaboré par le Point Focal National mais nécessite encore la recherche de financement, dans le cadre des activités du Comité National sur la Gestion Intégrée des Zones Côtières.

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.

UPDATE (2014):

- At a local level, hotel staff and marine protected areas managers in the Baly Bay have adopted economic incentives to encourage the protection of nesting turtles (reward of 200 000 Ar/individual for each nest discovered and protected until the hatching of the eggs) and the rescue of marine turtles (reward of 100 000Ar by turtle incidentally captured and released with the marine park staff); in 2013 these measures have helped to monitor and protect approximately 30 green turtle nests.

- Au niveau local, les hôteliers et les promoteurs des aires marines protégées de la baie de Baly ont pris des mesures économiques incitatives pour la protection des tortues nidifiant (récompense de 200 000 Ar/personne pour chaque nid découvert et protégé jusqu'à l'éclosion des œufs) et la sauvegarde des tortues en mer (récompense de 100 000Ar par tortue capturée incidemment et remise en liberté avec les responsables des parcs marins) ; en 2013 ces mesures ont permis de suivre et protéger approximativement 30 nids de tortue verte.

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.

UPDATE (2014):

- The CNRE has been designated as National Focal Point IOSEA / MoU program since the signing of the memorandum by Madagascar. As such, it coordinates and implements all measures taken for the conservation of sea turtles.
- Le CNRE a été désigné comme Point Focal National du programme IOSEA/MoU, depuis la signature du mémorandum par Madagascar. En tant que tel, il coordonne et dynamise toutes les mesures prises pour la conservation des tortues

marines.

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 .

UPDATE (2014):

As part of the implementation of the National Action Plan for the conservation of marine turtles and their habitats, a series of consultation meetings were initiated in 2013 and will be continued this year. The primary goal is to ensure that all government agencies have a common understanding of texts and act within the framework of regional and local measures. Besides, the need for additional texts and especially for regulations supporting the implementation of the existing law will be considered during the implementation phase of the national action plan.
Dans le cadre de la mise en œuvre du Plan d'Action National pour la conservation des tortues marines et de leurs habitats, une série de réunions de concertation a été initiée en 2013 et sera poursuivie cette année. Le but premier est de s'assurer que toutes les agences gouvernementales ont une compréhension commune des textes et agissent en coopération dans le cadre de mesures régionales et locales. Par ailleurs les besoins en textes complémentaires et surtout en textes réglementaires d'application de la loi existante seront étudiés lors de la mise en œuvre du plan d'action national.

Comments/suggestions to improve the present reporting format:

Additional information not covered above: