Mozambique

GENERAL INFORMATION

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

Center for Sustainable Dvelopment of Coastal Zones Ministry for Coordination of Environmental Affair

This national report relies heavily on information contained in the comprehensive report prepared by Louro et al. 2006

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

To be completed

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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]

Mozambique possesses 2700 km of coastline that stretches from the Rovuma River, in the north, on the border with Tanzania, to Ponta do Ouro, in the south, on the border with South Africa. The coastal zone comprises eight of the eleven provinces of the country, namely Cabo Delgado, Nampula, Zambezia, Sofala, Inhambane, Gaza, Maputo and Maputo-City. The coastal zone has been divided into three natural ecoregions, namely the coralline, swamp coast and the parabolic dune coasts (Massinga & Hatton 1996). A fourth ecoregion, the delta coast, is restricted in distribution and occurs only at the mouths of the Zambeze and Save rivers.

The coralline coast is found between the Rovuma River and the Primeiras and Segundas Archipelago, and is approximately 770 km long. It is characterized by numerous islands of coralline origin and an almost continuous fringing reef (Tinley 1971; Massinga & Hatton 1996). The swamp coast extends from Pebane to the Bazaruto Archipelago and is 950 km long (Massinga & Hatton 1996). Twenty-four rivers drain to the Indian Ocean in this area, each sustaining a well developed complex of mangroves. Lastly, the parabolic dune coast extends from Bazaruto Island to Ponta do Ouro for approximately 850 km. Vegetated dunes that attain heights in excess of 100 meters, capes, barrier lakes and extensive sandy beaches are typical of this section (Hatton 1995; Massinga & Hatton 1996).

Five species of marine turtles occur and nest in the marine and coastal zones of Mozambique (Costa et al. 2007). These are the loggerhead turtle (*Caretta caretta*), the green turtle (*Chelonia mydas*), the leatherback turtle (*Dermochelys coriacea*), the hawksbill turtle (*Eretmochelys imbricata*) and the olive ridley turtle (*Lepidochelys olivacea*). They make use of a variety of coastal and marine ecosystems as feeding, growth, breeding and nesting grounds (Hughes 1971;

Pereira et al. 2008).

Marine turtles possess high ecological, social and economic values, are considered symbols of biodiversity conservation and are protected under national legislation as well as international conventions. However, in Mozambique marine turtles have received little attention in regards to research and conservation measures. In general, marine turtles occur and nest throughout the Mozambican coastline, with a few areas of higher incidence.

Several natural and anthropogenic factors threaten their survival. It is believed that these populations are facing a continuous decline, which will persist unless appropriate management and conservation measures, such as legislation implementation and enforcement, education and public awareness, are implemented. Marine turtles are slow growing with a long and complex life cycle. As consequence, they are extremely susceptible to human activities in all stages of their life cycle. It is believed that these species of marine reptiles protected by law worldwide are facing a serious and uncontrolled decline in Mozambique (Gove & Magane 1996), mainly due to human actions.

The present knowledge regarding marine turtle biology and conservation in Mozambique is scarce (Pereira et al. 2008) and is mainly comprised by the work done in the 1970s by Hughes (1971), Tinley (1971) followed by Gove, Magane and colleagues (Gove & Magane 1996; Gove et al. 2001; Magane & Joao 2002) and Lombard (1997, 2004, 2005). Knowledge regarding many ecological aspects, including nesting sites, is also lacking (Louro et al. 2006).

The information available at present suggests that the northern section of Mozambique (specifically between Primeiras and Segundas Islands, and the Quirimbas Archipelago) encompasses important feeding and nesting sites particularly for green turtles, and to a somewhat lesser extent hawksbill and olive ridley turtles (Costa et al. 2007). Peak nesting seasons vary between Primeiras / Segundas and Quirimbas, the former being from August to October, and January to April in the Quirimbas National Park.

The central part of the Mozambique coast (Pebane to Bazaruto Island) is characterised by loggerhead, leatherback, green, hawksbill and olive ridley turtles. The main nesting species in this section is loggerhead turtles, with some nesting activity by green, leatherback and hawksbill turtles (Louro et al. 2006; Costa et al. 2007; Videira and Louro 2008). Loggerhead turtles nest predominantly in the southern section of the country, from Bazaruto Archipelago to Ponto do Ouro, and in particular the Maputo Special Reserve (Hughes 1971; Gove and Magane 1996; Louro et al. 2006). Lombard (2005) reported high nesting concentrations of loggerheads in the vicinity of Ponta Malongane.

The first conservation and management initiatives took place in the 1990s, mainly in the southern part of the country, being very localized. Currently, much of the Mozambican coast is being monitored by various projects. It is, however, important that these monitoring programmes are coordinated at a national level, with standardised monitoring protocols and better communication / data sharing between groups (Pereira et al. 2008).

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

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

Studies:
No known socio-economic studies specific to marine turtles have been conducted.

Activities:
Monitoring programmes coordinated by the Mozambique Marine Turtle Working Group, and the Zoological Society of London (CABO Delgado/Maluane Marine Turtle Programme) train and employ local villagers as patrol guards / rangers who are tasked with turtle tagging, monitoring of nests, and raising the awareness of local communities and particularly artisanal fishermen on marine turtle conservation (Garnier and Silva 2007; Costa et al. 2007).

Some turtle watching activities has been incorporated with the monitoring programme along the Matutuine coast (Kyle and Lombard 1996, in Louro et al. 2006; Lombard and Kyle 2008). The economic impact of this venture is limited, as few people take part in it. The income generated is used to finance the Matutuine monitoring programme, and is therefore of little direct economic benefit to the local community. There are currently no (commercial) tourist operations focussing on turtle watching in Mozambique (Louro et al. 2006).

A Women's Association was founded on Vamizi Island in 2007, as part of the Zoological Society of London (ZSL) Marine Turtle Programme, with the support of Projecto de Gestao de Biodiversidade Costeira Marinha (PGBCM) and GEF. The project helps to create alternative livelihoods (through the selling of arts and craft and by entertaining tourists with traditional dance) and so reduces pressures on natural marine resources. It has also been valuable in changing the perceptions of the local community towards turtles (Garnier and Silva 2007).

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:

☐ Other2:

☐ Other3:

☐ None of the above or Not Applicable

Ease of access to turtle resources (Gove and Magane 1996 in Costa et al. 2007): The close proximity of towns/villages as well as tourist developments to turtle habitats are posing a threat to these animals.

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)

The ZSL operating on the islands of Vamizi and and Rongui, has implemented a reward system whereby fishers are encouraged to take an incidentally-caught (live) turtle to the project headquarters (as opposed to killing it). The reward amounts to about US$ 4. In this way data are collected from the turtle, and the opportunity is also used to educate fisherman regarding turtle conservation (Garnier and Silva 2007). This programme is thought to have raised awareness among fishermen and also to have reduced turtle mortality (Garnier and Silva 2007).

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

a) Shrimp trawls: ■ YES ☐ NO

Trawling is considered one of the most important causes of turtle mortality in Mozambique, if not the most important (Louro et al. 2006). Trawling operations, specifically shallow-water prawn fisheries, are centred in Maputo Bay and Sofala Bank (Brinca & Palha de Sousa 1984 and Tomas 2001 in Louro et al. 2006). The only study assessing the effects of trawling on turtles in Mozambique was conducted by Gove et al. (2001), on the Sofala Bank. Gove et al. (2001) estimated the incidental capture of between 1932 and 5436 turtles per annum during the prawn fishery season, in Sofala Bank. A large proportion of these turtles are killed by fishermen for consumption (Goncalves, M., pers. comm.; Louro et al. 2006). Turtle captures have also been reported for Maputo and Bazaruto Bays (Guissamulo 1993 in Louro et al. 2006), but quantitative data are generally lacking.

With the approval of the new General Regulation of Maritime Fisheries, the use of Turtle Excluder Devices (TED) are mandatory in any trawling fishery aided by a motor, and therefore it is hoped the situation might be reversed. However, none of the trawlers operating in Mozambique is thought to have implemented TEDs (Pereira et al. 2008).

b) Set gill nets: ■ YES ☐ NO

No specific information available, although the use of gill nets is mentioned by Louro et al. (2006).

c) Anchored Fish Aggregating Devices (FADs):

No information available

d) Purse seine (with or without FADs):

No information available

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

Illegal Asian longline fishing vessels, which target tuna and sharks, are posing a new threat to turtles in Mozambique. Turtle by-catch, predominantly green turtles, are not released alive but simply beheaded during collection of the longline to increase the efficiency of the process (Lorou et al. 2006). In one incidence, 42 beheaded green turtles were reported by tourists from the beach between Inhassoro and Bartolomeu Dias. Thus far, international attention and awareness campaigns from environmental agencies have had little impact, with new incidents of illegal longline fishing and the killing of marine turtles being reported frequently (Louro et al. 2006).

f) Driftnet:

No information available

g) Other1:

Beach seining using tractors, is a fishing art perfected in the Inhassoro area, Inhambane, and apparently restricted to this area. Traditionally, these nets have caught numerous marine turtles, which prompted the Grupo de Trabalho Ambiental (GTA) to develop a marine turtle conservation project in the late 1990s. However, the information produced is not ready available. It has been estimated that 20-35 marine turtles were killed every month, for eight months of the fishery (Gove & Magane 1996; Hughes 1971; Magane et al. 1998). More recently, Balidy (unpublished data), recorded, at Inhassoro and Vilankulos districts, the incidental capture of 46 marine turtles (of these 38 were greens, 4 loggerheads and the remaining 4 were not identified). The Inhassoro district showed the highest number of incidental captures. Eleven of these were already dead when observed

h) Other2:

This has been an ancient practice and has been relatively small in dimension, given the restrictions associated (myths, taboos, etc). Nevertheless, Hughes (1971), warned already in the 1970s that high levels of turtle mortality were caused by traditional use. Certainly, this mortality must have increased with the degradation of traditional values during the 1980s and 1990s. Due to the lack of law enforcement and control, little is known about the number of marine turtles killed by the artisanal fishery and traditional practices. Currently, the practice of capturing marine turtles for food and subsequent sale of carapace is becoming a common practice in the coastal zone of the country, with turtles being "accidentally" caught in trawling or gill nets, caught on the beach during nesting or using spear guns.

☐ **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: Gove et al. (2001) quantified the impact of prawn trawling on marine turtles on the Sofala Bank. Trawling is expected to be either one of or the most important causes of turtle mortality in Mozambique (Louro et al. 2006).

b) Set gill nets

Fishing effort:

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

Perceived Impact:

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

Source: To be completed: No quantitative information regarding fishing effort or its impact is available.

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: To be completed: No information available.

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: To be completed: No information available.

e) Longline (shallow or deepset)

Fishing effort:

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

Perceived Impact:

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

Source: Although a relatively "new" threat, illegal Asian longliners targeting tuna and sharks could potentially be a very important cause of the high turtle mortality rates observed in some regions (Louro et al. 2006; Pereira et al. 2008). Quirimbas Archipelago in particular is an area of concern (Pereira et al. 2008), with high turtle mortalities reported.

f) Driftnet

Fishing effort:

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

Perceived Impact:

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

Source: To be completed: No information available.

g) Other1 (from 1.4.1): **Beach Seining**

Fishing effort:

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

Perceived Impact:

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

Source: An estimated 20 to 35 turtles are captured and killed monthly, for eight months of the year (Gove and Magane 1996 in Louro et al. 2006; Magane et al. 1998). Balidy (unpublished data) reported the incidental capture of 46 turtles (mostly green turtles) in Inhassoro and Vilankulos (Louro et al. 2006). This type of fishing, however, appears to be very localised, occurring predominantly in the Inhassoro region.

Chacate (2005) also made estimates of /quantified incidental turtle captures at Inhassoro and Vilanculos, but the relevant paper is not yet available.

h) Other2 (from 1.4.1): Artisanal fishery and traditional use

Fishing effort:

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

Perceived Impact:

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

Source: Marine turtle mortality associated with traditional practices and artisanal/subsistence fisheries is expected to be high (Hughes 1971; Magane et al. 1998; Pereira et al. 2008), although it has not been quantified (Louro et al. 2006). With the breakdown of traditional values, which once imposed restrictions in the form of taboos, myths etc. on the use of turtles, mortality due to subsistence use is thought to have increased (Louro et al. 2006). Although subsistence use and artisanal fishing is thought to be increasing (Magane et al. 1998), these impacts are not equally high along the Mozambican coast. Lombard and Kyle (2006; 2008) reported reduced impacts (poaching, the killing of nesting females) along the south coast form Ponta Malongane to Ponto Dobela. The authors attributed this decline to more efficient beach monitoring as well as an increase in job creation in the tourism sector, in this region (Lombard and Kyle 2008). Furthermore, awareness campaigns (such as those coordinated by the MMTWG) have resulted in a reduction in poaching of turtles and turtle eggs in Primeira and Segundas the islands; subsistence fishers are starting to play a more active and positive role in turtle conservation (Costa et al. 2007).

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]

Illegal Asian longline fishing vessels, targeting tuna and sharks, are thought responsible for the killing (beheading) of an increasing number of incidentally caught marine turtles (predominantly green turtles) along the coast (Louro et al. 2006). Turtles are beheaded when longlines are collected, in an attempt to increase the efficiency and speed of the hauling process (Louro et al. 2006). A public outcry against this practice followed in January 2003 when tourists from the area between Inhassoro and Bartolomeu Dias, reported 42 turtles that had been killed in this way. However, international attention and awareness campaigns from environmental agencies have had little impact, with new incidents of illegal longline fishing and the killing of marine turtles being reported frequently.

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

To be completed

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**

In 2003, the use of turtle excluder devices (TEDs) by motorised trawlers became mandatory under the General Marine Fisheries Regulations, Decree 43/2003 of 10 December (Pereira et al. 2008). However, it is not clear whether any of the trawlers currently operating in Mozambique are using TEDs (Pereira et al. 2008).

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

f) **Net retention and recycling schemes**

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

h) **Effort management control**

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

☐ 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

To be completed

Vessel monitoring systems

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

Training programmes / workshops to educate fishers

■ **YES** ☐ NO ☐ NOT APPLICABLE

A number of marine turtle programmes are actively involved with education and awareness campaigns aimed at local communities in general, and often fishers specifically. Such initiatives include the Mozambique Marine Turtle Working Group (MMTWG) Project in Primeiras and Segundas Islands, and the ZSL (Costa et al. 2007; Garnier and Silva 2007). These programmes appear to be successful in changing the attitudes of fishers towards turtles and turtle conservation (Costa et al. 2007).

Informative videos, brochures, printed guidelines etc.

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

Other (list and explain):

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

☐ **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

To be completed

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]

Gove et al. (2001) assessed the impact of prawn trawling on marine turtles and the effect of TEDs on this fishery, in Sofala Bank.

Chacate (2005) assessed the impact of beach seining on marine turtles in Inhossora and Vilanculos.

WWF-Mozambique is supporting marine turtle monitoring and conservation programmes in Bazaruto Archipelago, Quirimbas Nation Park, and Primeiras and Segundas islands.

The Mozambique Marine Turtle Working Group is currently coordinating six tagging/monitoring programmes along the Mozambican Coast. This also includes awareness campaigns and educational initiative. Turtle tagging and monitoring is conducted in southern Mozambique (Ponto Malongane to Ponto Dobela) in collaboration with Ezemvelo KwaZulu-Natal Wildlife, South Africa.

The Zoological Society of London (ZSL)/Maluane turtle programme (a collaborating venture between the ZSL and the UK Marine Turtle Research Group) is operating on the islands of Rongui, Vamizi and Macaloe. The programme carries out monitoring of nesting activity and nesting success, awareness campaigns and education, and research, including genetic studies, satellite tagging, and habitat-use studies.

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

Information is exchanged at international workshops (eg Western Indian Ocean turtle excluder device (TED) training workshop, 1998, Kenya), and conferences (e.g. Annual Symposium on Biology and Conservation of Sea Turtles, 2002, Miami, USA).

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]

To be completed

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

National Legislation

The current legislation in the country, with regards to the protection and conservation of marine turtles, includes the following:

Indirect Incidence
The Constitution
The Mozambican Constitution clearly shows a concern withs regards to the conservation of the environment. Article 37 reads "The State promotes initiatives to guarantee the ecological equilibrium, conservation and preservation of the natural environment in order to improve the quality of life of the citizens." Therefore, the constitutional setting has been created and the State is responsible for leading environmental conservation actions.

The Environmental Law (Law 20/97 of 1 October 1997)
The Environmental Law, especially in its Article 12, refers to biodiversity protection, and it reads in section 1 "All activities that endanger the conservation, reproduction, quality and quantity of the biological resources are forbidden". Clearly, there is a window of opportunity for the protection of marine turtles, these being species threatened with extinction. Moreover, it is the Government's responsibility to ".... guarantee that appropriate measures are taken with the purpose of: a) maintaining and regenerating animal species, recover of damaged habitats (...), by controlling those activities or the use of substances susceptible capable of destroying wildlife and their habitats."

Other environmental legislation of indirect incidence, that are worthy to mention are:

i) Environmental Impact Assessment Regulation (Decree 45/2004 of 29 September 2004), refers for example, to any development initiative that might affect threatened species or sensitive ecosystems (e.g. coastal dunes and other relevant marine turtle habitats) require an environmental impact assessment;
ii) Tourism Law (Law 4/2004 of 17 October 2004), refers in its Article 9, no 2, that "Tourism in conservation areas helps the conservation of the ecosystems, habitats and species of the referred area".;
iii) the Strategy and Action Plan for the Biological Diversity of Mozambique; has its main goal "... to set directives and define priority actions to be implemented by the diverse economic sectors to guarantee a sustainable development." More precisely, and with respect to marine turtles, goals for 2010 have been determined among others, the existence of a more profound knowledge and an improved conservation status of relevant species, threatened and/or endemic. It is also mentioned, the need for the knowledge on the biodiversity and dynamics of valuable and/or fragile ecosystems and of the interaction between adjacent ecosystems.

Direct Incidence
Forests and Wildlife Regulation (Decree 12/2002 of 6 June 2002)
This is currently, the piece of Mozambican legislation that directly protects marine turtles, among other wildlife species. The Articles 43 (5) and 44 (1a), fully protect the species listed in Annex II (of which all 5 species of marine turtle are included), and sets the fine for illegal hunting of marine turtles at 25,000,000.00 Mts. (around USD 1000 at 2009 exchange rate)

The Regulation also predicts the aggravation of fines depending on the circumstances (Article 114 and Annex III) where the following is applies to marine turtles:
---- Hunting in a forbidden area (e.g. Parks and Reserves) - 10,000,000.00 Mts
---- Hunting with forbidden means or instruments (e.g. gill nets in forbidden areas) - 20,000,000.00 Mts
---- Hunting without license (the Regulation predicts the issuing of special licenses for scientific research, Article 44 (2

and 3) - 30,000,000.00 Mts
---- Hunting of protected species - 100,000,000.00 Mts
---- Trade, importing or exporting of wildlife specimens without a permit - 10,000,000.00 Mts
---- Actions against rare species or threatened with extinction, for which exploitation is forbidden - 1,000,000,000.00 Mts
---- Use of violence, threat or showing resistence to enforcement - total fine value plus 60%

Additionally there is the possibly of an aggravation of 40% of the fine, if the offenders are an organized group. The Regulation also stipulates an aggravation of 50% of the fine value if the offender is a wildlife officer, community guard, Police Officer, Military or a public worker of the Forests and Wildlife or Tourism Services.

Recreational and Sports Fishing Regulation (Decree 51/99 of 31 August 1999)
This regulation acts specifically upon the recreational and sports fishery. It also forbids marine turtle fishing (Article 14 and Annex II). The fine in this case, for the capturing and possession of a protected species is of 8,000,000.00 Mts to 10,000,000.00 Mts per specimen.

General Regulation of Maritime Fishing (Decree 43/2003 of 10 December 2003)
In this Regulation (Article 110.1), the use of the Turtle Excluder Device is mandatory to all trawling fisheries aided by a motor. According to section 2 of the same Article "Failure to use the device constitutes a serious fishing practice infringement in terms of section a) of Article 53 of the Fishing Law and is punishable in accordance with number 2 of the same article". This has direct relevance to the shallow-water prawn fishery, as mentioned earlier.

Conservation Areas Management Plans
The management plans of coastal and marine conservation areas, namely the BANP, QNP and the MSR, clearly forbid any activities that might endanger marine turtles, their eggs, nests and in general its habitat.

As illustrated above, turtles are protected with a well-developed legal framework in place; however the laws are not readily enforced, with only one record of offenders having been charged (Pereira et al. 2008).

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

Traditionally, coastal communities make use of marine turtle eggs and meat (Gove & Magane, 1996). This practice is quite common throughout the coastal zone where the concentration of marine turtles is high. There are reports of these practices in the Quirimbas Archipelago, Mozambique Island, Vilankulos, Bazaruto Archipelago, Maxixe, Tofo, Jangamo, Xai-Xai, Bilene, Macaneta, Inhaca and the Matutuine coast.

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

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

The sale of marine turtle carapaces, in handcrafted form (necklaces, earrings, rings, bracelets, etc.) or whole, in shanty craft markets and tourist centres is an old practice. Hughes (1971) referred to this practice especially regarding the green and the hawksbill turtles in the Inhassoro region and Mozambique Island, respectively. Recently, a study conducted by the WWF -Mozambique, found that this practice is also common in shops (including the Maputo

International Airport and other commercial centers) and markets of Maputo City (Costa, A., pers. comm.). This is considered as an illegal practice and therefore it must be descouraged. One alternative is the development of a tourism industry of marine turtle observation, as proposed by Pereira (2004) for the Matutuine region. There are already several successful cases in at least 42 countries. South Africa (Maputaland) constitute a good example where 45,000.00 US$ in 2003 were raised (Troeng & Drews, 2004).

Fat consumption

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

Besides using the meat for human consumption, at Inhaca Island, the raw oil of the leatherback turtle is used to paint boats and when boiled is used for cooking (Impacto 1997).

Traditional medicine

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

Pieces of carapace are used by witch doctors (Gove & Magane 1996) in the practice of traditional medicine. Little is known, however, about these practices, which are restricted and maintained in secrecy.

Eco-tourism programmes

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

Currently, there is no tourist operation focusing on turtle watching. Mr. Pierre Lombard has integrated within his monitoring program in the Matutuine coast, a turtle watching activity during the nesting season. Since at least 1996, almost 200 tourists have participated (Kyle & Lombard 1996). However, these activities are very restricted and not well publicized and the number of people involved is actually very low. Around 4-6 people per night participate and pay a value of around ZAR50.00 per person. This value is used to support petrol costs related with the monitoring activities (Lombard 2004).

The growth of costal tourism in the country (Abrantes & Pereira 2003), could stimulate the development of this activity, which could be undertaken by both tourism operators as well as by the local communities. However, being a highly seasonal activity it would not support a large industry. It could be an extra service offered by settled tourism operators or an alternative for the local communities. Either way, these operations will require specific regulations to be sustainable.

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:

Gove and Mangane (1996). The status of sea turtle conservation in Mozambique. In: Humphrey S. L. & R.V. Salm (eds). Status of sea turtle conservation in the western Indian Ocean. Regional Seas Reports and Studies. No.165: 89-94 pp IUCN/UNEP. 1996.

Costa et al. (2007). Marine turtles in Mozambique: Towards and effective conservation and management programme. Marine Turtle Newslatter 117: 1-3.

Videira et al. (Eds) 2008: Monitora, marcacao e conservacao de tartarugas marinhas em Mocambique: Dados historicos e relatoricos anual 2007/08

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

■ **YES** ☐ NO ☐ UNKNOWN

2000/2001 Welcome Campaign: Coordinated by FNP, in collaboration with MICOA, FUTUR, the Navy, Migration Authorities, Police and Local Administrations. This campaign focused on coastal tourism in southern Mozambique (Maputo, Gaza and Inhambane) and involved education and awareness about the conservation of coastal and marine environments, mainly sandy beaches, coral reefs and marine turtles. This involved the distribution of brochures, posters and stickers at the borders, hotels, camping sites, restaurants, etc. (Abrantes & Pereira 2002).

Trade of Marine Protected Species: This campaign was started in 2004 and focused its attention in the trade of marine protected species, including marine turtles, corals and some species of bivalves and gastropods. Developed and implemented by the WWF, with the support of other non-governmental organizations such as FNP, CTV and GTT. The main goals were to create awareness among more than 500 school pupils of 16 primary schools in Maputo and Matola. Shop owners and market outlets selling artefacts crafted from marine protect species were also involved, through plays, t-shirt and brochure distribution, as well as public environmental debates. An assessment on the trade of marine turtle artifacts in Maputo City was conducted (WWF, 2005).

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]

Turtle monitoring in southern Mozambique is conducted in collaboration with Ezemvelo KZN Wildlife, South Africa. This is, however, not a formal agreement.

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

WWF-Mozambique is supporting marine turtle monitoring and conservation programmes in Bazaruto Archipelago, Quirimbas National Park, and Primeiras and Segundas islands. The Mozambique Marine Turtle Working Group is currently coordinating six tagging/monitoring programmes along the Mozambican Coast. This also includes awareness campaigns and educational initiatives. Turtle tagging and monitoring is conducted in southern Mozambique (Ponto Malongane to Ponto Dobela) in collaboration with Ezemvelo KwaZulu-Natal Wildlife, South Africa. The Zoological Society of London (ZSL)/Maluane turtle programme (a collaborating venture between the ZSL and the UK Marine Turtle research Group) is operating on the islands of Rongui, Vamizi and Macaloe. The programme carries out the monitoring of nesting activity and nesting success, awareness campaigns and education, and research, including genetic studies, satellite tagging, and habitat-use studies.

A number of logistical challenges hamper the effectiveness of monitoring/tagging/conservation programmes in Mozambique, one of the most important factors being a lack of coordination of and communication/information sharing between the various programmes and organisations involved (Pereira et al. 2008). Insufficient financial support, equipment and training, and limited support and commitment from governmental authorities further limit the success

of the monitoring programmes (Pereira et al. 2008). However, at a local scale, progress has been made in terms of raising the awareness of turtle conservation within communities.

Education / awareness programmes

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

Organisations such as the MMTWG (which oversees a number of projects) and NGOs such as the ZSL/Maluane Marine Turtle Programme, have initiated education and awareness campaigns, often targeting specific groups such as children or fisherman (Costa et al. 2007; Garnier and Silva 2007).

2000/2001 Welcome Campaign: Coordinated by FNP, in collaboration with MICOA, FUTUR, the Navy, Migration Authorities, Police and Local Administrations. This campaign focused on coastal tourism in southern Mozambique (Maputo, Gaza and Inhambane) and involved education and awareness about the conservation of coastal and marine environments, mainly sandy beaches, coral reefs and marine turtles. This involved the distribution of brochures, posters and stickers at the borders, hotels, camping sites, restaurants, etc. (Abrantes & Pereira 2002).

Trade of Marine Protected Species: This campaign was started in 2004 and focused its attention in the trade of marine protected species, including marine turtles, corals and some species of bivalves and gastropods. Developed and implemented by the WWF, with the support of other non-governmental organizations such as FNP, CTV and GTT. The main goals were to create awareness among more than 500 school pupils of 16 primary schools in Maputo and Matola. Shop owners and market outlets selling artefacts crafted from marine protect species were also involved, through plays, t-shirt and brochure distribution, as well as public environmental debates. An assessment on the trade of marine turtle artifacts in Maputo City was conducted (WWF, 2005).

Egg relocation / hatcheries

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

There are currently no (known) egg/nest relocation programmes being implemented in Mozambique. Nest destruction by natural causes (inundation and erosion) have been increasing in the last few years, and especially in the 2007/08 season, and the number of nests lost was high. In such cases, nest relocation programmes should probably be considered. This will require specialized training of the rangers and monitors. Additionally, given the costs involved, these programs should be conducted in important and justifiable areas where resources, commitment and political will exist from the managers and institutions (Pereira et al. 2008).

Predator control

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

To be completed

Vehicle / access restrictions

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

By law it is prohibited to drive on the beach (Decree 45/2006 of 30 November: Louro et al. 2006). This is, however, ignored and violated on a systematic basis, under the complacency of the relevant authorities (Pereira 2008). The situation is exacerbated by a notable increase in coastal tourism in the last few years in Mozambique (Abrantes & Pereira 2003). Unfortunately, this has been followed with negative tourism practices with consequences not yet quantified for the fauna and flora. Driving of 4x4 vehicles in the southern beaches is such an example. It is known that traffic of 4x4 vehicles has impacts on nesting marine turtles, nest preservation and hatchling survival (e.g. see review by Stephenson, 1999). However, there are no such studies in Mozambique. Coastal development, especially the lighting on the streets, houses and hotels affects hatchling orientation and possibly causing extensive mortality (Bertolotti & Salmon 2005; Mayor 2002).

Removal of debris / clean-up

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

To be completed

Re-vegetation of frontal dunes

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

To be completed

Building location/design regulations

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

To be completed

Light pollution reduction

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

There are no (known) official measures in place to minimise the effect of light pollution on turtles/hatchlings, with only examples of localised efforts to reduce light pollution (e.g. holiday lodges at Comisete Beach, Vamizi Island: Garnier and Silva 2007). Coastal development, especially the lighting on the streets, houses and hotels affects hatchling orientation and possibly causing extensive mortality (Mayor 2002; Bertolotti & Salmon 2005; Pereira et al. 2008).

Other (list and rate them)

☐ YES ☐ NO ☐ N/A

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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]

Coastal erosion (i.e. disappearing of sandy beaches for nesting) is one of the most serious threats to the survival of marine turtles in Mozambique (Gove & Magane 1996), the cases of Inhassoro and Macaneta, constituting good examples (Louro 2005). Nonetheless, there are no studies detailing the magnitude of impact on marine turtles. Judging by the areas mentioned earlier (nesting areas) it might be expected that the survival of the hatchlings may be affected as reported by Rumbold et al. (2001) in Florida.

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

Coastal tourism has been growing notably in the last few years in Mozambique (Abrantes & Pereira 2003). Unfortunately, this has been followed with negative tourism practices with consequences not yet quantified for the fauna and flora. Driving of 4x4 vehicles in the southern beaches is such an example. It is known that traffic of 4x4 vehicle has impacts on nesting marine turtles, nest preservation and hatchling survival (e.g. see review by Stephenson 1999). However, there are no such studies in Mozambique. Coastal development, especially the lighting on the streets, houses and hotels affects hatchling orientation and possibly causing extensive mortality (Bertolotti & Salmon, 2005; Mayor 2002).

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

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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)

To be completed

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)

To be completed

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)

To be completed

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]

Abrantes, K. G. S. & M. A. M. Pereira. (2003). Boas Vindas 2000/2001: A Survey on Tourists and Tourism in Southern Mozambique. 21 pp. Maputo, BICO/FNP.

Bertolotti, L. & M. Salmon (2005). Do embedded roadway lights protect sea turtles - Environmental Management, 36: 702-710.

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Bouchard, S. S. & K. A. Bjorndal (2000). Sea turtles as biological transporters of nutrients and energy from marine to terrestrial ecosystems. Ecology, 81: 2305-2313.

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Gove, D., H. Pacule & M. Goncalves (2001). The impact of Sofala Bank (Central Mozambique) shallow water shrimp fishery on marine turtles and the effects of introducing TED (Turtle Excluder Device) on shrimp fishery. 23 pp. Maputo, Report to the Eastern Africa Marine Eco-Region of WWF.

Guissamulo, A. T. (1993). Distribuicao e abundancia de golfinhos e dugongos e suas interaccoes com algumas pescarias nas Baias de Maputo e Bazaruto. Trabalho de Licenciatura. 93 pp. Maputo, Departamento de Ciencias Biologicas, UEM.

Hatton, J. (ed). (1995). A Status quo assessment of the coastal zone, Mozambique. Phase 1: Ponta do Ouro - Xai-Xai. IUCN: 1-60pp.

Heithaus, M. R., J. J. McLash, A. Frid, L. M. Dill & G. J. Marshall (2002). Novel insights into green sea turtle behaviour using animal-borne video cameras. Journal of the Marine Biological Association of the U.K., 82: 1049-1050.

Hill, N. & J. Garnier (2003). Monitoring of Populations of Endangered Species. In: Garnier, J. (ed). Cabo Delgado Biodiversity and Tourism Project. Report for the Marine Programme. 54-69 pp. CDBTP Pemba and ZSL - London.

Hughes, G. (1971). Preliminary report on the sea turtles and dugongs of Mocambique. Veterinaria Mocambicana 4 (2): 43-84.

Hughes, G. (1974a). The sea turtles of south-east Africa I. Status, morphology and distributions. Oceanographic Research Institute Investigational Report, 35: 1-144.

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Kotas, J. E., S. Santos, V. G. Azevedo, B. M. G. Gallo & P. C. R. Barata (2004). Incidental capture of loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles by the pelagic longline fishery off southern Brazil. Fishery Bulletin, 102: 393-399.

Kyle, R. & P. Lombard (1996). Sea turtle research in southern Mozambique. A brief overview and results of some recent

monitoring and tagging activity. Relatorio nao publicado. 13 pp.

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Lombard, P. (2004). Marine turtle monitoring and conservation in southern Mozambique: 2003/2004 update. Relatorio nao publicado. 5 pp.

Lombard, P. (2005). Monitoria e conservacao das tartarugas marinhas no sul de mocambique. Sumario relativo a onze anos. 1995 - 2005. Ponta Malongane. Relatorio nao publicado. 7 pp.

Louro, C. M. M. (2005a). Perfis ecologicos de especies e ecossistemas costeiros de Mocambique: Dunas costeiras. Relatorio de Investigacao No 3: 28 pp. Maputo. Centro Terra Viva.

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Mackie, C. S. (1999). Aerial census of dugongs, dolphins and turtles in the proposed greater Bazaruto National Park, Mozambique: April 1999. WWF Project Paper. WWF Southern Africa Regional Programme Office. Harare.

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Troeng, S. & C. Drews (2004). Money talks: economic aspects of marine turtle use and conservation. 62 pp. Gland, WWF.

Videira, E. J. S. & C. M. M. Louro (2003). Analise dos estudos feitos no Parque Nacional do Arquipelago do Bazaruto.108 pp. Maputo. BICO/FNP/WWF.

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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

Hughes (1971; 1972; 1974) conducted the first studies in Mozambique with regard to species composition, distribution, conservation and threats to marine turtles. Dias et al. (1971) conducted a preliminary biodiversity assessment of Bazaruto Archipelago (Dias et al. 1971). This involved an assessment of marine turtles and threats to their conservation. The main goal of the survey was to assess the ecological status of the archipelago, in order to propose adequate protection measures. Tello (1973) also conducted an ecological assessment of the MSR and identified the main species of marine turtles that nested in the region, as well as the main nesting beaches. However, it was only after 1987, that actions for research, monitoring and management of marine turtles in Mozambique began, and these are as follows:

Ponta do Ouro to Cabo de Santa Maria -Maputo, Southern Mozambique: Two monitoring programmes have been developed in this region: (1) The Monitoring and Conservation of Marine Turtles in Southern Mozambique Program, which started during the 1994/1995 nesting season, and has been implemented for almost 11 years. It covers the

area between Ponta do Ouro and Ponta Dobela. The program has the support of the Mozambican Government, more specifically the National Directory of Forests and Wildlife (DNFFB) and the Kwazulu Natal Wildlife (KZNW) from South Africa. The main objectives are to monitor and tag nesting females, to promote the awareness of the local communities and tourists, and to control beach driving (Kyle & Lombard 1996; Lombard 1997; Lombard & Kyle 2004; Lombard 2005); (2) Monitoring and Conservation of Nesting Females, Nests and Hatchlings of *Dermochelys coriacea* and *Caretta caretta*, it started in 1996 and covers the entire coastline of the MSR, between the southern point of Ponta Dobela and north of Ponta Chemucane. It is implemented in collaboration with local communities and the guards of the MSR under the management of National Directorate of Forests and Wildlife, currently the National Directorate of Conservation Areas. In the 1999/2000 season improvements were made in the method of data collection in order to allow a systematic and more detailed analysis (Magane & Joao 2000). Apparently, monitoring continued for one more season (2000/2001; Magane & Joao 2001, 2002) and was terminated due to financial constraints.

Ilha da Inhaca -Maputo, Sul de Mocambique: The Inhaca Island Marine Turtle Conservation Program, more specifically in the east coast of the island, began in 1987. The main goal was to monitor nesting females of leatherback and loggerhead turtles, nests and hatchlings (Kalk & Costa 1995; Gove & Magane 1996). This is the oldest marine turtle monitoring programme, however the data collected has not been systematically kept nor analysed (Louro, pers. comm.). A peculiar aspect of the program is the famous story of guard Raimundo Singa, responsible for controlling the 12 km of beach at the east coast of the island to protect the nests. Mr. Singa has already walked 38 880 km, which equals two-way trips Maputo - London (Impacto 1997).

Macaneta -Maputo Peninsula, Southern Mozambique: The Project for Biodiversity Conservation and Sustainable Development of Macaneta began in 2002 and is being implemented by CESVI and FNP. Among the several activities of this project, it includes a program for the protection of marine turtles through the control of nesting females, nests, tagging of nesting females and turtles accidentally captured in fishing nets. A private ecotourism project, of which little information is available, also runs a tagging program. This is done with the support of the local communities, which receive a reward whenever a turtle is delivered and tagged.

Vilanculos Coastal Wildlife Sanctuary -Inhambane, Southern Mozambique: This initiative has created a great conflict of interests with the local communities, and is located in Inhambane Province, at the northern point of Peninsula do Cabo de Sao Sebastiao. It was created in October 2000, by the Council of Ministers and has an area of approximately 25 000 ha of land and sea. It is supported by foreign investment and its main aim is to establish an eco-tourism project to manage and conserve the natural resources, including a marine turtle monitoring program (Louro, pers. comm.). No information is available on this project, with only a reptile species list of the area being provided on the projects's website http://www.thesanctuary.co.za.

Inhassoro -Inhambane, Southern Mozambique: Gove & Magane (1996) mention a marine turtle tagging program established at Inhassoro, and implemented by GTA. However, information regarding the program's activities and data collected is not available.

Bazaruto Archipelago -Inhambane, Southern Mozambique: In partnership with the local communities and the park authorities, established the Monitoring and Conservation of Marine Turtles Nests during the 1994/1995 nesting season. It is implemented throughout the east coast of the islands (Videira & Louro 2003). The Monitoring of Occasional Occurrence, Abundance and Mortality of Marine Turtles, Dolphins and Dugongs started in 1999, all around the archipelago (Videira & Louro 2003). These monitoring programs are still being implemented by the Projecto de Gestao Comunitaria dos Recursos Naturais (CBNRM -Community Based Natural Resource Management) that has the support of the WWF and FNP. It is important to mention that in 2005 an analysis was made using the data collected so far. The goal was to compile all data collected as well as to improve the system of data collection and analysis, especially with regard to the conservation status of marine turtles in the country (Videira & Louro 2005). Periodic aerial monitoring activities of dugongs, dolphins and marine turtles also take place (Cumming & Mackie 1995; Mackie 1999; Mackie et al. 2001).

Sofala Bank - Sofala, Central Mozambique: The impact of the shallow-water prawn fishery on marine turtles was studied in the Sofala Bank (Gove et al. 2001). Additionally the study also looked at the effect of the Turtle Excluder Devices (TEDs) on prawn catches.

Primeiras and Segundas Islands -Zambezia and Nampula, Northern Mozambique: In partnership with the local communities and with the support of the WWF, a project regarding the conservation and monitoring of nests and marine turtles was established in this area in 2004 (WWF 2004). Information regarding activities and data collected has not yet been published (see Local Community Involvement).

Quirimbas Archipelago -Cabo Delgado, Northern Mozambique: In 1996, the Society for Environmental Exploration and MICOA started a biodiversity assessment program, for a two-year period in the Quirimbas Archipelago. Random observations were made along with the monitoring and analysis of the level of marine turtle exploitation in the region (Whittington et al., 1998). Since 1998, the Cabo Delgado Biodiversity and Tourism Project has operated in partnership with a foreign private investor, the Zoological Society of London (ZSL) and with the support of the Mozambican government (i.e. Provincial Directorate for Environmental Affairs in Pemba), the Natural History Museum in Maputo and the Department of Biological Sciences, Eduardo Mondlane University. The main objectives are to monitor and

protect nesting *Chelonia mydas* and *Eretmochelys imbricata* females and their nests (Hill & Garnier 2003). However, information published regarding this project is not readily available. It is also important to mention that this project is running a marine turtle tagging programme, where titanium tags are being used with the tag codes MZC0000 MZC0999.

More recently, the Associacao para Investigacao Costeira e Marinha (AICM) started monitoring and research programmes in Bazaruto Archipelago National Park, the area between Ponto do Ouro to- Machangulo, Macaneta, Bilene, Primeira and Segundas, and the Rovuma basin.

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

■ **YES** ☐ NO ☐ UNSURE

A genetic study is being conducted by the ZSL (CABO Delgado Marine Turtle Project). Nesting populations of hawksbill and green turtles form Vamizi and Rongui islands are assessed (Garnier and Silva 2007).

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

Mozambique Marine Turtle Tagging Program is being implemented by the Mozambique Marine Turtle Working Group (GTT), since 2003 with the support of national (CTV, FNP) and international organizations (WWF, MCS). The main aims of this project are to: (1) tag marine turtles, both nesting females and those accidentally captured in fishing gear throughout the Mozambican coastline; (2) develop and implement a national tagging system; and (3) develop a data base in order to facilitate future data analysis as well as to share information at a national and international level. The program has developed a tagging information sheet and the titanium tags being used have the MO801-1550 and MZ001-400 codes (Louro, 2005a). Various monitoring and conservation projects described in Table 1 collaborate with the program.

Monitoring Programs ----------Tags----------Tagged Marine Turtles

Quirimbas National Park----------MO 979 -1000----------NA

Bazaruto Archipelago National Park----------MO 821-850----------25
----------MO 1001-1050

Vilankulos Coastal Wildlife Sanctuary----------MO 851-90----------NA

A private initiative in southern Mozambique (Ponto D'oro - Ponto Malongane) in collaboration with EKZN Wildlife, South Africa, is tagging nesting loggerhead and leatherback turtles. Mozambican tags (coded as MZ) are being used. In the 2007/2008 season alone, 74 loggerheads and 6 leatherbacks were tagged (Lombard and Kyle 2008).

Satellite tracking ■ **YES** ☐ NO

Satellite tagging is conducted by the Zoological Society of London (under the CABO Delgado project/ Maluane turtle programme) operating in Quirimbas. The first green turtle was fitted with a satellite tag in 2007 on Vamizi Island.

☐ **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

To be completed

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

☐ YES ☐ NO ☐ UNSURE

To be completed

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

☐ YES ☐ NO ☐ UNSURE

To be completed

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]

To be completed

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

To be completed

b) Conservation status ☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

c) Migrations ☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

To be completed

☐ **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 Turtle (*Caretta caretta*): Distribution in Mozambique: Hughes (1971) has reported that *C. caretta* is found throughout the entire Mozambican coastline, although being more common in southern Mozambique.

Loggerhead turtles nest south of the Tropic of Capricorn, in the southern coast, from the Bazaruto Archipelago to Ponta do Ouro (Hughes, 1971; Gove & Magane 1996; In the Bazaruto Archipelago National Park (BANP), the loggerhead turtle is the most abundant nesting species (51.76%; Videira & Louro in prep.). Hughes (1971) and Tello (1973) reported that the Maputo Special Reserve (MSR) was an important nesting ground for this species. Magane & Joao (2001, 2002a, 2002b) have reported similar results. In the 1999/2000 nesting season, 255 nests were reported. This indicated a slight increase when compared to past seasons (Magane & Joao 2001). In this region, the most preferred nesting grounds are Dobela -Matondo (Magane & Joao 2002b). Tello (1973) reported that in this area, nesting occurs between the end of October and February. Magane & Joao (2002b) have observed the same trend, but the highest nesting activity occurred between November and January, as also reported by Hughes (1971). Data from an 11-year tagging program (1994/1995 to 2004/2005 nesting seasons) in Ponta Malongane (southern Mozambique) indicate that approximately 300 loggerhead turtles were tagged (Lombard 2005). In this region, two areas of high nesting density have persisted through the years, on the 7th and 27th kilometer north of Ponta Malongane (Lombard 2005).

Green Turtle (*Chelonia mydas*): Distribution in Mozambique: Considered by Hughes (1971), the most common marine turtle along the Mozambican coast, even though there are certain regions where it is more abundant. Although more studies are necessary, the protected waters of the Bazaruto Archipelago are thought to be feeding and growth grounds of *C. mydas* (Hughes 1971; Louro 2005b). The Zenguelemo area, in Bazaruto Island is the area where most green turtles have been captured and recaptured (Videira & Louro, in prep.).

In 1971, Hughes reported that south of the Sofala province there was no record of nesting of this species, except for two small islands in the Cabo de Sebastiao. Gove & Magane (1996) reported that it only nested north of the Tropic of Capricorn, in the Quewene Peninsula and the Quirimbas Archipelago. However, it has been recently observed to nest at the Bazaruto Archipelago (Videira pers. obs.). Monitoring has shown that *C. mydas* is the second most common species nesting in the BANP (Videira & Louro in prep.). Hughes (1971) identified the Primeiras and Segundas Islands as areas of high concentration for nesting. In this area, the nesting population is estimated to be about 40 turtles per nesting season (Costa pers. obs.).

Hawksbill Turtle (*Eretmochelys imbricata*): Distribution in Mozambique: found throughout the coastline, but is mostly abundant in the northern part of the country, where shallow coral reefs are most common (Hughes 1971). Through the tagging program two hawksbill turtles have been tagged, one at the MSR (Joao, pers. obs.) and the other at the BANP (Louro 2005b). It is believed that Santa Carolina Island, in the Bazaruto Archipelago, is a growing habitat for this species (Videira & Louro, in prep.).

Hawksbills nest most frequently on islands and sporadically on the mainland in the northern part of the country (Hughes 1971). The same author has suggested that the islands of Quirimbas, Sencar and Mefunvo were used has nesting grounds, however this needs confirmation. There are records of nesting at the Quirimbas Archipelago, more precisely at Vamizi Island (Hill & Garnier 2003). In the BANP there are some signs that this species might nest, however, this also requires confirmation (Videira & Louro in prep.).

Olive Ridley Turtle (*Lepidochelys olivacea*): Distribution in Mozambique: this species was considered common north of Pebane (Hughes 1971). Carapaces of *L. olivacea* were found from the Segundas Islands northwards (Hughes 1971). A piece of the carapace was identified at Tofo Beach, Inhambane (Louro pers. obs.). The Cabo Delgado Biodiversity Project has reported this species to occur between Vamizi and Rongui islands, as well as close to Quiterajo, all year round. Its relative abundance suggests that this species uses this area as foraging and developing ground (Hill & Garnier 2003).

According to Hughes (1971), this species nests both on islands and the mainland of the northern part of the country, presenting almost the same nesting distribution as *E. imbricata*. The use of nesting beaches of the BANP by *L. olivacea* needs confirmation. In the 2004/2005 nesting season an individual was identified at the BANP (Videira & Louro in prep.).

Leatherback Turtle (*Dermochelys coriacea*): Distribution in Mozambique: In southern Mozambique, from the BANP to Ponta do Ouro (Hughes 1971). Nesting occurs on mainland beaches, in southern Mozambique (Hughes 1971). In the BANP, *D. coriacea* ranked third in nesting incidence (12.94%; Videira & Louro in prep.). During the 1999/2000 and 2000/2001 nesting seasons, 92 and 105 nests, respectively, were identified in the MSR (Magane & Joao 2001). Twelve to 13 females were estimated in both nesting seasons (Magane & Joao 2002b). In terms of spatial distribution this species prefers the Dobela -Matondo and Chimucane -Mucombo regions. The *D. coriacea* nesting period coincides with that of *C. caretta* (Magane & Joao 2002b). Lombard (2005) reported that 82 nesting females were tagged, in a period of 11 years, from 1994/1995 to 2004/2005.

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

To be completed

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]

To be completed

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

This has been identified as an area of concern that needs to be addressed (Pereira et al. 2008).

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]

To be completed

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

Exchange of data takes place between EKZN Wildlife, South Africa, and the private monitoring initiative by P. Lombard, for tagging/monitoring conducted in southern Mozambique, in the form of annual reports.

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]

2000/2001 Welcome Campaign: Coordinated by FNP, in collaboration with MICOA, FUTUR, the Navy, Migration Authorities, Police and Local Administrations. This campaign focused on coastal tourism in southern Mozambique (Maputo, Gaza e Inhambane) and involved education and awareness to the conservation of coastal and marine environment, mainly sandy beaches, coral reefs and marine turtles. This carried out by the distribution of brochures, posters and stickers at the borders, hotels, camping sites, restaurants, etc. (Abrantes & Pereira 2002).

Trade of Marine Protected Species: This campaign was started in 2004 and focused its attention in the trade of marine protected species, including marine turtles, corals and some species of bivalves and gastropods. Developed and implemented by the WWF, with the support of other non-governmental organizations such as FNP, CTV and GTT. The main goals were to create awareness among more than 500 school pupils of 16 primary schools in Maputo and Matola. Shop owners and market outlets selling artefacts crafted from marine protect species were also involved, through plays, t-shirt and brochure distribution, as well as public environmental debates. An assessment on the trade of marine turtle artefacts in Maputo City was conducted (WWF, 2005).

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

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

☐ YES ☐ NO

To be completed

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.

To be completed

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]

In the first few years (1994 -1997) of the Conservation and Monitoring of Marine Turtles in Southern Mozambique Project, two local guards were controlling the beaches during the nesting season. They also conducted local community awareness regarding the value of conservation of marine turtles (Lombard 2005). Efforts are being made to improve awareness, as well as the development of alternatives, for example subsistence agriculture and new job opportunities to reduce the need for marine turtle?€?s eggs and meat (Lombard 2005). Magane & Joao (2002) stated that the Program for Monitoring Caretta caretta and Dermochelys coriacea nesting females had the support of the local communities.

Nest monitoring in the Bazaruto Archipelago National Park has had great involvement of the local community through frequent educational and awareness meetings (Gove & Magane 1996; WWF 2004). This was confirmed by Gove & Magane (1996) that reported the increase of number of protected nests from 6 in the 1989/1990 season to 24 in the 1994/1995 season. Videira & Louro (2005) also reported that in the last three monitoring seasons 2002/2003, 2003/2004 and 2004/2005 no nests were lost due to theft, which implies a greater awareness in the protection of marine turtles and its nests. It is important to mention that 70% of the nests were found by the local communities (Videira & Louro 2005). Another point of interest and support by the local communities is the Tagging Program. Whenever a marine turtle is accidentally captured in the nests, local fishermen bring the turtle to the guards for tagging (Louro 2005a; Videira & Louro 2005). This involvement and support, is also reported in Macaneta Beach, north of Maputo City (Louro 2005a).

Local communities with the support of the WWF, in the Primeiras and Segundas Archipelago are involved in the nest protection of *Caretta caretta, Chelonia mydas* and *Eretmochelys imbricata*. Nests were destroyed and the eggs collected for sale in Angoche (WWF 2004). According with the same source, in April 2004, the fishermen of Njovo and Puga-Puga, created committees and selected guards for the protection of these marine species. It is expected that these activities will be extended to other islands of the archipelago and that these will be incorporated in the national marine turtle tagging program (WWF 2004).

The Cabo Delgado Biodiversity and Tourism Project, with the support of the local communities, have trained, in

September 2002, local patrol guards. The work aimed at contributing to a create awareness in the local communities of the benefits associated with preserving marine turtles, nesting females and nest monitoring as well as its protection. Whenever a marine turtle was killed or a nest destroyed, the guards would inform the local authorities at Palma (Hill & Garnier, 2003).

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]

To be completed

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

To be completed

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

☐ YES ☐ NO ☐ NOT APPLICABLE

To be completed

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

To be completed

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]

To be completed

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]

To be completed

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

To be completed

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]

RESEARCH AND MONITORING

Nesting and Feeding Habitats:
--- Identify and map the nesting and feeding habitats throughout the entire coast, focusing in the central and northern parts of the country, particularly outside the conservation areas;
--- Determine the main areas to start or continue with the long term monitoring programs: (1) Nest monitoring: determine species composition, main areas, intensity and nesting trends, determine nesting success, record annual mortality and main causes; (2) Feeding monitoring: determine population size, annual mortality records and main biological factors;

Nesting and Feeding Populations:
--- Encourage sightings of marine turtles by the local communities, fishermen, conservation areas guards, sporting clubs, flying schools, tourism operators, divers, etc;
--- Encourage tagging and record of marine turtles in nesting habitats, feeding and growth habitats using standard methodology, in accordance with the Mozambican Marine Turtle Tagging Program;
--- Encourage information sharing related with the capture and re-capture of tagged marine turtles at a national, regional and international level;
--- Elaborate genetic assessments of marine turtles in the nesting, feeding and growth areas throughout the Mozambican coastline;

Threats:
--- Elaborate detailed studies with regards to threats to marine turtles and the possible mitigation measures, namely:

(i) accidental capture in the industrial, semi-industrial and artisanal fisheries;
(ii) quality, level of threat and vulnerability of the nesting, feeding and growth habitats (e.g. the impacts of trawling on the seagrass beds, driving on nesting beaches and coastal development activities on critical habitats);
(iii) assessment of factors associated with nest exploitation (e.g. human predation and predation by feral and wild animals);
(iv) assessment on the trade of marine turtles and its products and its impact on population survival;

Research and Monitoring Reports:
--- Compile historic information on nesting, feeding and growth habitats and on the exploitation of marine turtles;
--- Promote the development and use of standard methods in the collection and analysis of data for all the research and monitoring programs;
--- Produce and disseminate annual reports by each of the research and monitoring programme as well as a national annual report;

CONSERVATION AND MANAGEMENT

Habitat Protection:
--- Develop protection areas denominated marine turtle sanctuaries or protected marine areas by the communities; these could be nesting and feeding areas currently unprotected;
--- Implementation of the complementary legislation regarding for example, vehicle driving in sandy beaches and coastal dunes;

Accidental Fisheries Mortality:
--- Enforce the mandatory use of the Turtle Excluder Devices (TEDs), in the shallow-water prawn fishery;
--- Control or suspend the use of fishing gear (e.g. gill nets) that endangers the survival of marine turtles, in areas where marine turtles are known to nest and feed;
--- Identify important nesting and feeding habitats for marine turtles that require periodical no-take seasons;

Local Community Involvement:
--- Promote the participation of local communities in assessments, monitoring and management of marine turtles;
--- Develop management measures in collaboration with the local communities;
--- Develop alternatives for the local communities that live close or within conservation areas;
--- Promote eco-tourism activities related with marine turtles, to ensure benefit sharing with the local communities;
--- Collect local knowledge from the communities with regards to marine turtles (e.g. natural history, uses, myths, among others);

Legislation and Enforcement:
--- Strengthen the existent legislation to include the conservation of critical habitats, outside conservation areas (for example coral reefs and seagrass beds are not currently protected);
--- Strengthen the law enforcement capability of governmental agencies (e.g. DNFFB, DNAC) in collaboration with the maritime authority, of nesting, feeding and growth areas outside conservation areas;
--- Strengthen the governmental agencies' capabilities for the implementation of the legislation, through capacity

building and equipment supply (e.g. boats and communication systems);

Capacity Building, Education and Awareness:
--- Establish regional agreements with research and monitoring institutions;
--- Encourage the participation of the local communities in monitoring and conservation activities;
--- Encourage the involvement of Eduardo Mondlane University and ONGs in the capacity building of students and volunteers about species identification, ecology and management measures for marine turtles;
--- Implement a periodical training in monitoring techniques and management for scientists, managers, guards, local communities, and teachers;
--- Develop and implement an education and awareness program, having in mind the following interested parties: local communities, schools, civil society, conservation personnel at all levels, law enforcement personnel (maritime authorities, police, customs), planners and decision makers, private sector, tourism operators and local associations;

Funding:
--- Promote the search for funding in the long term for conservation activities in Mozambique;
--- Incorporate conservation activities in the working plans of relevant government and non-government environmental agencies.

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

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]

There are several initiatives within the Indian Ocean region, for the conservation of marine turtles. The following are highlighted:

Western Indian Ocean Strategy and Action Plan for the Conservation of Marine Turtles
This strategy and action plan was developed to reduce national and regional gaps in relation to conservation of marine turtles. It was developed in November 1995 in South Africa by representatives and scientists of several Western Indian Ocean countries, namely: South Africa, Comoros, Eritrea, Kenya, Reunion Island, Mauritius, Mozambique, Seychelles

and Tanzania (IUCN, 1996).

Eastern Africa Marine Ecoregion (EAME)
This includes the territorial waters and exclusive economic zones of southern Somalia, Kenya, Tanzania, Mozambique and South Africa (down to Sodwana Bay). An initiative promoted by the WWF, where different countries have adopted a regional approach regarding coastal and marine conservation challenges. The potential benefits that directly and indirectly serve the conservation of marine turtles are as follows: (1) collaboration in conservation; (2) greater involvement of the different parties; (3) promotion of the government support; (4) greater variety of options in conservation efforts; (5) integration of the conservation concept in the vision for coastal development; (6) acting on a geographic scale that corresponds to great ecological processes that support and maintain biodiversity; (7) support for the maintenance of species, populations and ecological processes that require vast areas for their survival. EAME identified Maputo Bay - Machangulo Complex and the Bazaruto Archipelago, as areas of global value due to their importance to marine turtles.

TRANSMAP
Scientists and regional agencies have developed a research project with the goal of developing a scientific database that will support the creation and management of transboundary marine protected areas in the region. The TRANSMAP project will include the coastal and marine transboundary areas between Tanzania and the north of Mozambique and South Africa and southern Mozambique. This includes the Mnazi Bay and Rovuma River estuary in Tanzania, the islands of the Quirimbas Archipelago, Machangulo Peninsula, Inhaca Island in Mozambique and the Saint Lucia region in South Africa. This project represents a potential contribution to achieve the goals of the Nairobi Convention as well as the New Partnership for the Development of Africa (NEPAD; The Oricle, 2005).

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]

To be completed

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]

Gaps, opportunities and challenges:

Although many of the conservation and management programs described previously play an important role in the conservation of marine turtles in Mozambique, through community involvement, nesting females and nest monitoring as well as tagging and awareness campaigns, there are still gaps in the knowledge of the current status of conservation of marine turtles. These gaps are:

(1) The majority of the research and monitoring programs are taking place in southern Mozambique; therefore there is a deficit of pertinent information, for example regarding the main nesting and feeding grounds in the central and northern parts of the country;

(2) Within these programmes, the great majority focus attention only on the reproductive biology of females and nests, putting aside its developmental and feeding biology;

(3) The information regarding populations and habitats is incomplete. The growth and feeding habitats are almost or totally unknown;

(4) The information regarding the level of human impact on the marine turtle populations in different stages of its life cycle, is also almost, or totally, unknown;

(5) The long-term programs, require systematic data collection and periodical data analysis, which could be made, for example each nesting season. Nest monitoring in the BANP started 1994/1995 and the data compiled in 2003 (Videira & Louro 2003) and the analysis was only done in 2005 (Videira & Louro in prep.). The same happened for the Inhaca Island monitoring program, where the data were only analysed in 1989;

(6) Some programs are short-lived; studies on the reproductive biology need to be long-term -- a decade or more -- in

order to analyse population size and trends. This is due to lack of financial and human resources;

(7) Although the Mozambique Marine Turtle Working Group was created and one of its goals is to improve the collaboration between several governmental and non-governmental environmental agencies involved in the management and conservation of marine turtles, with regard to research, management, control and implementation, this collaboration is currently still weak; and

(8) The lack of publication of activities and the results achieved by the different programs, especially those supported by foreign private investment, as well as by national environmental agencies.

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]

To be completed

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]

The Wildlife Community Guards Project, known has "Mungonzices" was created in 1990, in the Bazaruto Archipelago with the support of FNP. The main goal was to develop awareness among local communities on ecological aspects and to develop a structure within the community to preserve and make a sustainable use of the natural resources, and therefore keeping their interests and actively participating in the management of these resources. Another objective was to turn the guards into a communication channel between the local communities and the conservation authorities.

One of the activities of the Mozambican Marine Turtle Tagging Program is to build capacity among the local communities and wildlife guards as well as society in regard to the conservation and management of marine turtles. Between December 2003 and August 2005, four courses were given (at Macaneta, BANP, community representatives of the Gaza Province, through the Associacao para Saude Ambiental (ASA) and a group of students from UEM interested in matters related to marine turtles. These courses included information regarding species identification, biological and ecological aspects of each species, main threats, management and conservation measures, as well as common methods for tagging and nest monitoring (Louro 2005a).

Considering the gaps, it becomes extremely important to turn these into challenges in order to improve our knowledge of the biology, ecology and conservation status of marine turtles in Mozambique. It is also important to acknowledge the existence of environmental agencies as well as a Working Group to facilitate the communication between these agencies, conservation areas, monitoring programs, community involvement in some areas and to apply these, for example, where the level of exploitation is high, as is the case at Tofo Beach (see Threats). The interest and involvement of the private sector, environmental groups (e.g. ANAII, ASA) and regional programs in collaborative research, management and conservation of marine turtles must be explored and strengthened were appropriated.

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]

The enforcement of the current legislation requires the utmost urgent attention. There are virtually no control activities outside the Conservation Areas or in areas where conservation programs are currently underway. These, however, face enormous financial and material difficulties. In most situations, the lack of control does not imply necessarily, the lack of means or human capacity. The maritime authority, Provincial Services of Fisheries or Forestry and Wildlife possess delegations in the majority of coastal districts where there is a high occurrence of marine turtles, with special focus to the southern part of the country. However, there is a lack of motivation regarding the enforcement of the law, and to a certain degree a total lack of knowledge regarding the law. In the cases mentioned earlier of marine turtles killings almost in public (which were also made public through the media, e.g. at Tofo, Bazaruto, Bilene) constitute clear examples. Although several local authorities (Park guards, police, maritime authority, provincial services of forests and wildlife) were present, their action in respect to the conservation of marine turtles is nil. There is a great need, therefore, for motivation and action by the relevant authorities at the central, provincial and local level to guarantee the implementation of the law. Education and sensitization activities are equally necessary and should be taken into consideration, firstly by the local authorities followed by the general public.

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

To be completed

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

To be completed

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]

To be completed

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

To be completed

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]

To be completed

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]

To be completed

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

To be completed

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

To be completed

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

To be completed

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

■ **YES** ☐ NO ☐ UNSURE

The following are institutions that involved in research, conservation and management of marine turtles in Mozambique:

-- Ministerio para a Coordenacao da Accao Ambiental, Direccao Nacional de Gestao Ambiental involved in control and enforcement.

-- Centro de Desenvolvimento Sustentavel para as Zonas Costeiras involved in research and monitoring; conservation and management; control and enforcement; and networking.

-- Comite Inter-Institucional de Gestao Costeira involved in conservation and management and networking.

-- Ministerio da Agricultura, Direccao Nacional de Florestas e Fauna Bravia involved in research and monitoring; conservation and management; and control and enforcement.

-- Ministerio das Pescas Instituto de Investigacao Pesqueira involved in conservation and management.

-- Direccao Nacional de Administracao Pesqueira involved in control and enforcement; and networking.

-- Ministerio do Turismo, Direccao Nacional de Areas de Conservacao involved in research and monitoring; conservation and management; and control and enforcement.

-- Universidade Eduardo Mondlane, Departamento de Ciencias Biologicas involved in research and monitoring; conservation and management.

-- Estacao de Biologia Marinha da Ilha da Inhaca involved in research and monitoring; conservation and management; and control and enforcement.

-- Museu de Historia Natural involved in research and monitoring.

-- Cabo Delgado Biodiversidade e Turismo (CDBT)

-- WWF -Fundo Mundial para Natureza (WWF) involved in research and monitoring; conservation and management; and networking.

-- Forum para a Natureza em Perigo/CESV involved in research and monitoring; conservation and management; and control and enforcement.

-- Associacao dos Naturais e Amigos da Ilha da Inhaca involved in conservation and management; and networking.

Ponta Malongane Resort involved in research and monitoring; conservation and management.

-- Santuario de Vilankulos involved in research and monitoring; conservation and management.

-- Grupo de Trabalho Tartarugas Marinhas de Mocambique involved in research and monitoring; conservation and

management.

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

To be completed

Comments/suggestions to improve the present reporting format:

Additional information not covered above: