

# **STATUS AND MANAGEMENT OF MARINE TURTLES IN the QUIRIMBAS NATIONAL PARK**

A Report Prepared for the Quirimbas National Park



A report prepared by

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## **Acknowledgements**

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## **1. Introduction**

The survival of marine turtles depends on the conservation status of coastal and marine ecosystems, as they need different habitats to complete their life cycle. Marine turtles deposit eggs on clean sandy beaches, the hatchlings migrate through out unpolluted waters, and shallow feeding grounds, such as seagrass beds, coral reef to deep waters (Witham, R. 1995).

These creatures are unique components of complex ecological systems, the viability of which is link to exploitable products (such as fish, shell and invertebrates) (Carr *et al.*, 1978). By conserving them and their habitats, vast marine areas have to be taken in consideration. Marine turtles have immeasurable value as cultural assets as well as being important indicators of coastal and marine environments (Pilcher, 2001).

The Quirimbas National Park (QNP) is the first and only conservation area in Mozambique with both terrestrial and marine habitats, with a total of 750,630 ha of which 598,402 ha are terrestrial and 152,237 ha are islands and marine environment. This makes this area unique in terms of conservation of terrestrial and marine ecosystems in the country.

The marine turtle conservation and management programme in QNP started in July 2006, with the identification of important feeding and nesting grounds. This programme includes monitoring of turtle nesting, turtle tagging, turtle identification training courses and most importantly awareness programmes for visitors, local communities, local and migratory fishermen.

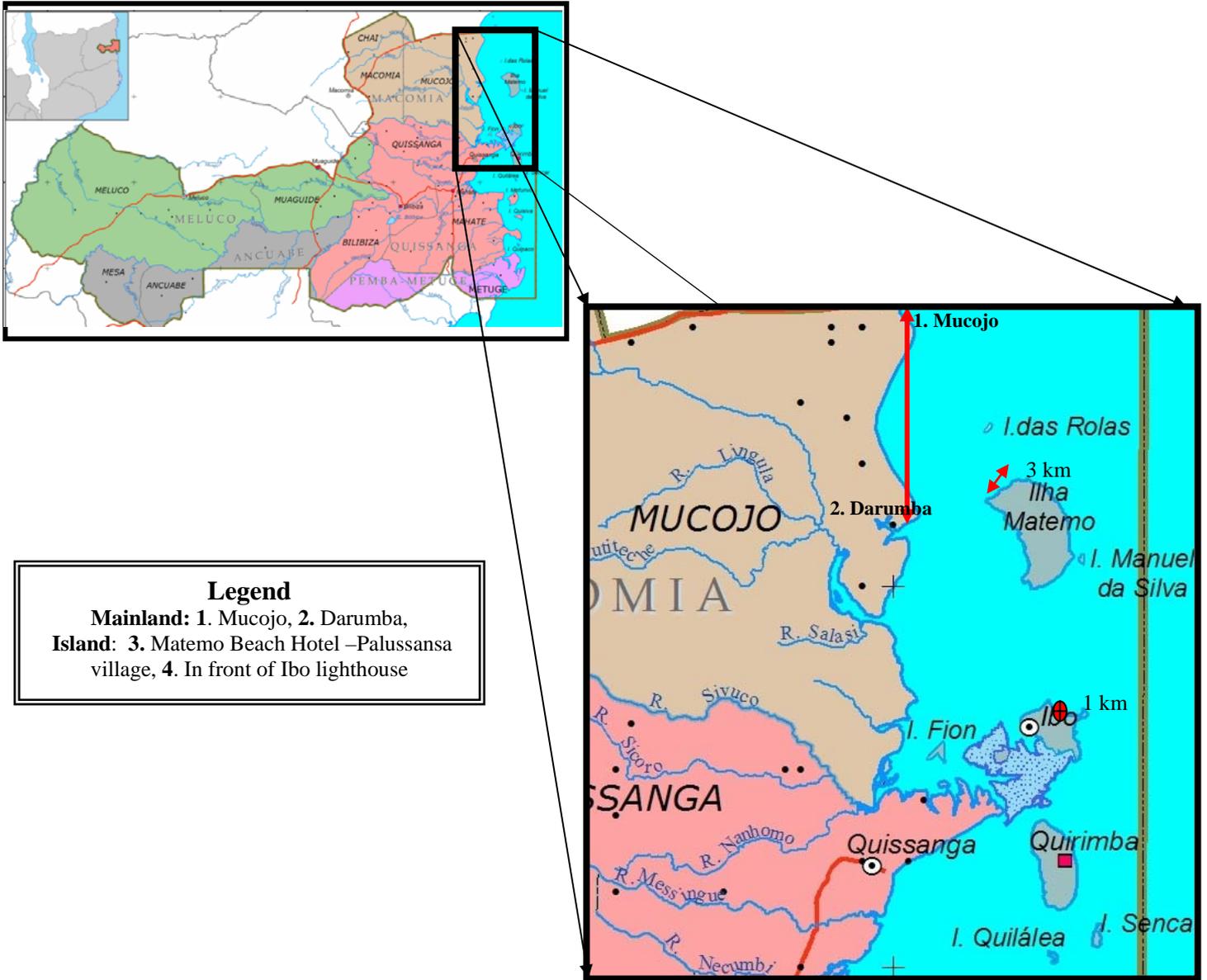
Hughes, 1971, and Whittington, 1998, reported that this area it is important nesting site for three species of marine turtle, they occur in the mainland and islands beaches.

## **2. Distribution/Occurrence of Marine Turtles in Quirimbas National Park**

Until now, 13 sites in the mainland and islands have been identified in the park with suitable conditions for turtle nesting. Three species of marine turtles were reported to feed and nest in seven of the eleven islands that are part of the QNP [namely Ibo (Paloco and lighthouse), Matemo (Palussansa, Machamba e Muanakomo villages), Quilalea, Sencar, Menfuvo, Rolas and Quisive]. The nesting areas identified in the mainland are Mucojo, Guludo, Darumba, Naunde, Namau and Quirimise and on islands.

Marine turtles occur along the park's shallow waters, in coral reefs, seagrass beds, and shallow lagoons. Ibo Island is an area of very high abundance of olive ridley and green turtles. On the other hand, the hawksbill turtle is abundant in the Quilalea and Sencar area. September to May it is the best time to observe marine turtles in the park, near the coral reef and seagrass habitats. In August, green and olive ridley turtles occur in great numbers on the exposed side of Ibo Island. The nesting season runs from October to January while the hatching season lasts until April.

## Quirimbas National Park Map



**Figure 1:** The map above illustrated some of the nesting sites in Mainland, which stretch from Mucojo to Darumba villages, with approximately 10 km. In addition, one of the areas identified in Matemo Island, is located next to Matemo Beach Hotel to Palussansa village with 3 km long. On Ibo Island, the area identified is located in front of the Ibo lighthouse with approximately 1 km long.

### **3. Profile of the three marine turtle species occurring in QNP**

#### **3.1 Green Turtle**

##### *3.1.1 Taxonomy*

Class:	Reptilia
Order:	Testudines
Family:	Cheloniidae
Scientific name:	<i>Chelonia mydas</i>
Portuguese name:	Tartaruga verde
Weight:	250 kg
Carapace length:	90 - 130 cm

##### *3.1.2 Description*

The carapace is broadly oval, margin scalloped but not serrated and four pairs of costal scutes. They are brown with radiating streaks in juveniles but variable in adults. The head is round with one pair of prefrontal scales. The limbs have single claws on each flipper. The breeding males are smaller than females, with females growing up to 130 cm curved carapace length (Pritchard and Mortimer, 1999).

##### *3.1.3 Distribution*

The green turtle is widely distributed within the island and coastal areas mentioned above. It is regularly observed in seagrass beds and coral reefs around the park, where adults with more than 40 cm and juveniles with less than 30 cm. Three nests were discovered in Matemo Island in Moanacomo and Mahamba villages, in November 2006. Unfortunately, carapaces of green turtles and corpses of adult turtles are also frequent seen. Matemo was only island where nesting activity was sighted. In the mainland (Namau), 8 carapaces of adult and juvenile green turtles identified. In addition, ten nests with evident hatchelling reported in Namau beach.

#### **3.2 Hawksbill Turtle**

##### *3.2.1 Taxonomy*

Class:	Reptilia
Order:	Testudines
Family:	Cheloniidae
Scientific name:	<i>Eretmochelys imbricata</i>
Portuguese name:	Tartaruga falcão
Weight:	150 kg
Carapace length:	80 - 100 cm

##### *3.2.2 Description*

The carapace is oval, posterior margin strongly serrated, thick overlapping (imbricate) scutes. Four pairs (ragged posterior border) of brown costal scutes, boldly marked with amber and brown variegations (Pritchard and Mortimer, 1999). They have a narrow head, straight bird-like beak, with two pairs of prefrontal scales. The limbs have two claws on each flipper and the plastron are light yellow to white.

### 3.2.3 Distribution

Hawksbill turtles are observed with the same regularity in the waters around Quilalea and Sencar (this is a total marine protected zone). Quilalea and Sencar islands are typically surrounded by reef habitat. This strong association is related to their diet, which consists mainly of sponges. There are no reports of nesting activities in the area as opposed to green turtles. The observation involves mostly juveniles with less than 30 cm in carapace length.

## 3.3 Olive Ridley

### 3.3.1 Taxonomy

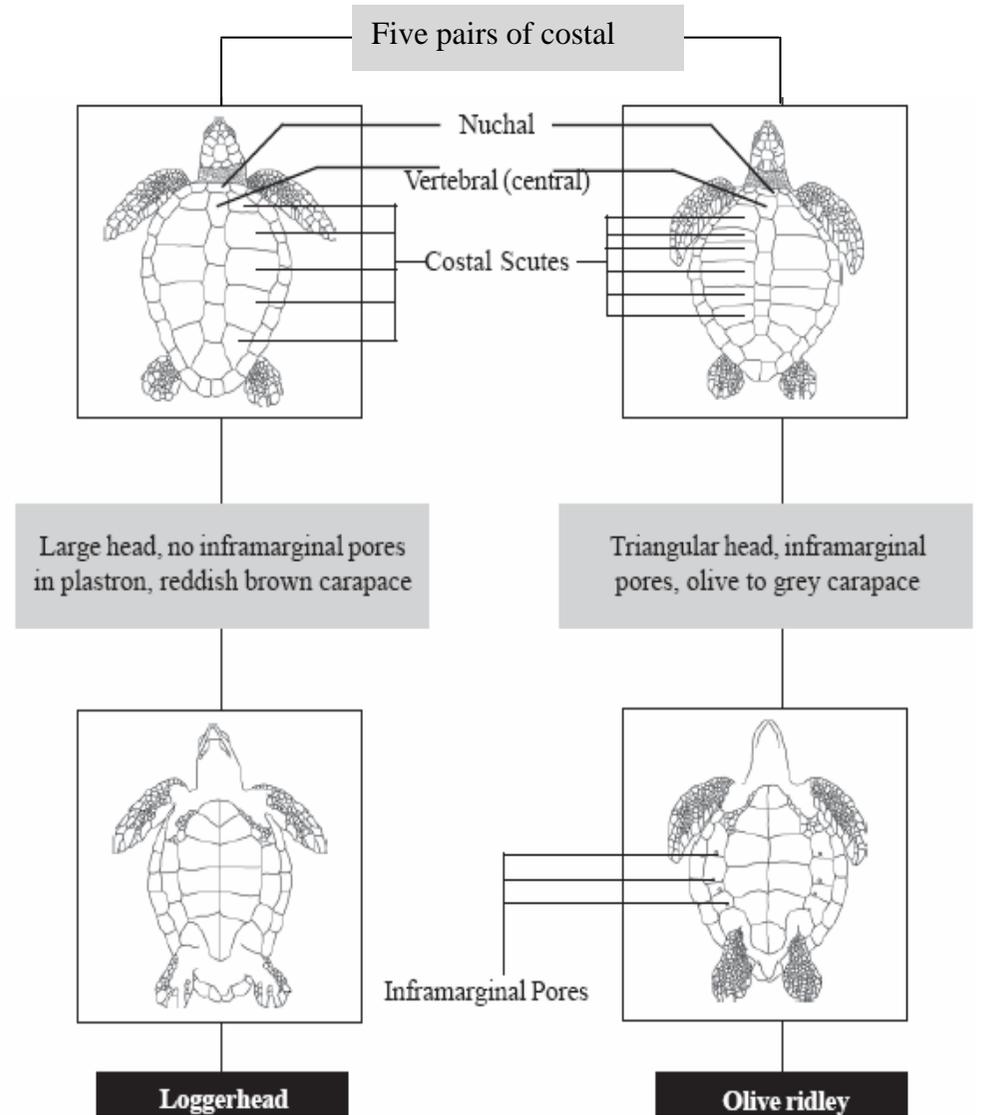
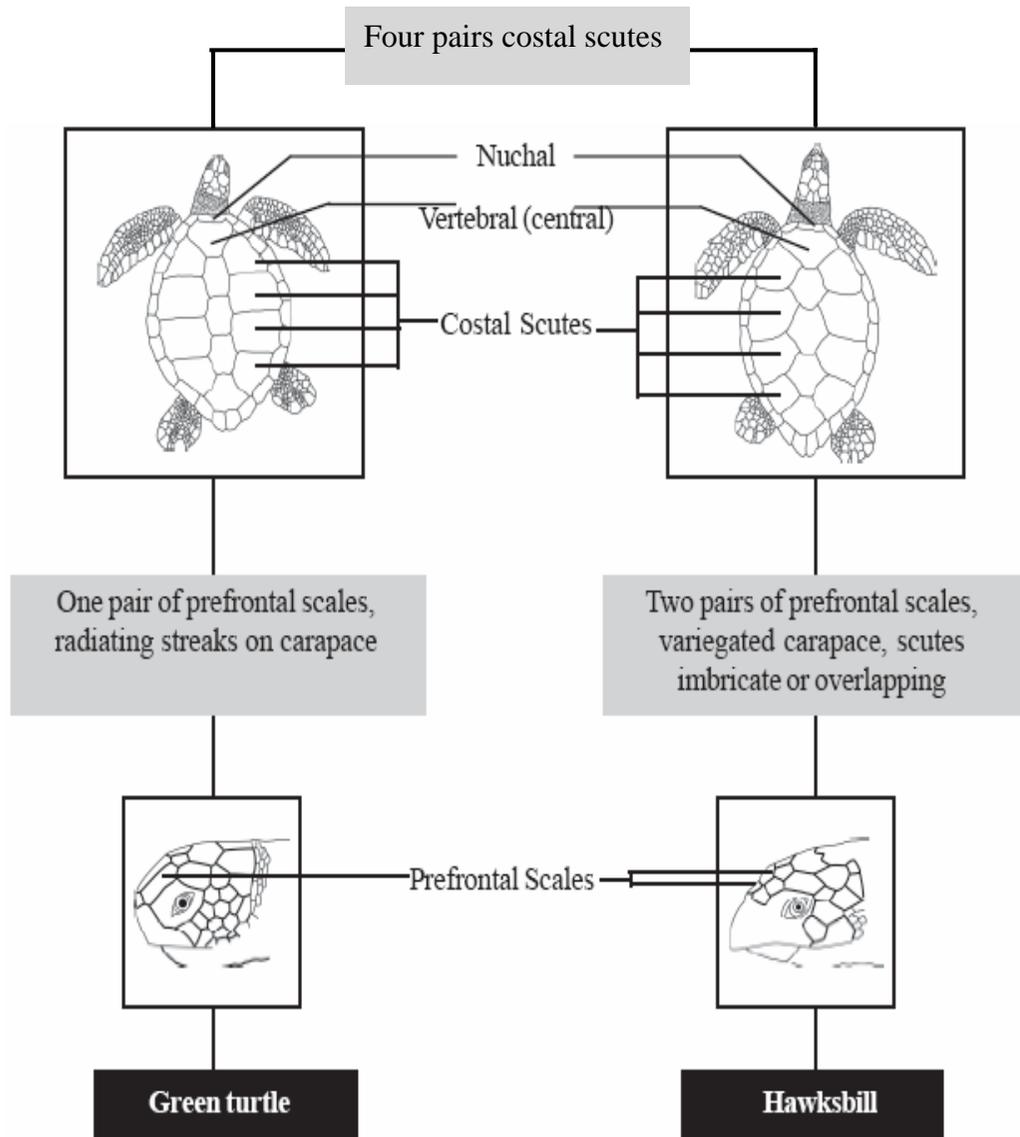
Class:	Reptilia
Order:	Testudines
Family:	Cheloniidae
Scientific name:	<i>Lepidochelys olivacea</i>
Portuguese name:	Tartaruga olivacea
Weight:	50 kg
Carapace length:	60 - 70 cm

### 3.3.2 Description

The carapace is short, wide and smooth but elevated. They have costal scutes with five to nine asymmetrical pairs. The colour is mid to dark olive green. The head is large and triangular. Two pairs of prefrontal scales. Limbs - two claws on each flipper (Pritchard and Mortimer, 1999).

### 3.3.3 Distribution

Olive ridley mostly sighted near Matemo, Rolas and mainland sites, which are relatively associated with soft-bottomed habitats inhabited by crabs and other crustaceans, which is characteristic of these areas. They are common in pelagic habitats, but also feed in shallow benthic habitats, sometimes near estuaries. The observation involves most adults with more than 50 cm in carapace length.



## **4. Conservation of Marine Turtle**

### **4.1 Threats**

Adult turtles are relatively free of natural predation but they are often killed by human activities. Marine turtles are hunted for their meat, shells and accidentally drown in fishing nets. They are particularly vulnerably during in the egg and hatchling stages.

The greatest threat to marine turtles in QNP is illegal “commercial” harvesting. Particularly, green turtles are harvested for their meat and the hawksbill for their shell. On Ibo Island, it is frequent to see, at night, fisherman selling marine turtle meat to islanders. On the other hand, in areas with suitable nesting conditions, it is normal to find corpses and carapaces of adult turtles lying on the beach.

The subsistence harvesting of marine turtles and their eggs, incidental capture in gillnets and trawling by local communities is another threat that marines turtle are facing in the park.

Example: In January 2007, next to the harbour on Ibo Island, two women were buying green turtle meat for, 15 MT per Kg, (less than 1 USD) from one local fishermen. This kind of trade occurs during the night (around 10:00 PM); because they know that, it is illegal. The park rangers know about the turtle meat trade.

In addition, beach development negatively impacts marine turtle survival by destroying nests and causing beach erosion. The lack of adequate protection against coastal erosion, artificial light that deters nesting females and lures hatchlings away from the ocean to certain death.

This is a problem on Matemo Island; the artificial light from Matemo Beach Hotel will affect female turtle that nest on beach next to Palusansa village. This is one of the examples; I believe that this is applicable to other lodges in the park.

### **4.2 Conservation options**

The protection of nesting, feeding and migratory sites such as coral reefs and seagrass beds is critical of the survival of the marine turtle. Once these habitats destroyed will take many years to recover (Carr *et al.*, 1978). Regarding the nesting beaches, it is important to reduce disturbance including closing beach to vehicular and pedestrian traffic during the main nesting season and minimizing the effect of artificial beach lightning turning them off during the nesting season or reduce the light intensity.

It is extremely important to protect eggs *in situ* this involves patrolling nesting beaches, nests identification (covering turtle tracks and cover nests), protecting eggs from natural predators, by placing nets over the nests.

In the case of Ibo Island, the fisherman leave the gillnets on the sea for two days. For this reason, it will be important to consider the soak time or restrict this type of fishing during the mating season in August.

### **4.3 Education Programme**

Many people are not aware of the threats to marine turtles or in the ways that their action may be affecting their long-term survival. Education and awareness programmes about the importance of marine turtles in the park should be focusing on the local community, youth groups, tour operators, and park visitors.

It is important to involve the local community on the awareness programme to make it more effective. The example of the turtle tagging and monitoring programme in Bazaruto National Park and Primeiras and Segundas Archipelago should be followed, were there was a change in the attitude towards marine turtles. Because of this change in fisherman's attitudes, there was an increase in the number of turtles tagged, from 2004 to 2006.

One of the tasks that the local community can undertake is to perform regular patrols in coordination with park rangers on the nesting and feeding areas. In addition, the local fisherman can participate on underwater turtle tagging programme.

## **5. Marine turtle monitoring and tagging**

The monitoring for marine turtle nesting should start in November and should last until the hatchling season at end of April. The survey to record the seasonality patterns of turtle emergence and mate behaviour should start in August. This information will be used to record the number of nests, false crawls, and most importantly the number of males (with long tail) present in the area. Male and female begin the reproductive cycle by migrating from feeding grounds to the breeding grounds.

Feeding grounds may be separate by thousands of kilometres. Courtship and mating occur in offshore waters of breeding grounds. Both female and male may mate with several different individuals (Pilcher, 2001). Several weeks after mating, the female came ashore to nest, mostly at night. They crawl above the watermark, find a suitable nesting site, clear away the surface sand, and dig out a flask shaped nest with their flipper (Hillestad, *et al.*, 1995). Turtle lay 100-150 eggs in the nest and fill it with sand. When the nesting is completed, they return to their feeding grounds until the next breeding migration.

Beach selections by marine turtles depend on the accessibility of the beach as well as height and substrate. Marine turtles prefer different type of beach to nest. In the case of olive ridley wide beaches and sand bars at river mouths are preferred (western coast of the park and island) while hawksbill and green turtles prefer small islands, that is the case of Ibo, Sencar, Quilalae, Matemo, Rolas, Menfuvo and Quisive.

Tagging of marine turtle involves marking turtle with metal tags to recognise them when they return to the same beach to nest, and hoping that other who encounters the same animal in distant shores will return the information. Marine turtle tagging has proved to be a valuable source of information on, growth, reproductive aspect, migrations pattern and population size.

It is important to emphasise that the monitoring and tagging programme on a single beach would probably not provide adequate data to estimate the inter-nesting intervals, clutches per season and migration pattern.

## **6. Recommendations**

### **6.1 Training programme**

There is a serious lack of trained personnel for the marine turtle work. It is important to ensure that the personnel with knowledge of turtle work are permanent workers.

### **6.2 Research and monitoring**

Promote research activities on marine turtle species and nesting habitats. Long-term monitoring of the tagged turtles to evaluate the growth rate, reproductive behaviour and population trends. Mapping of occurrence, distribution and nesting sites of marine turtle species around the park.

### **6.3 Awareness campaign**

- Production and dissemination of education material related on turtle conservation issues;
- Organization and promotion of awareness meetings and events with local communities, tourism operators, and governmental institutions, working in the area;
- Identification of specific nesting areas of the different marine turtle species occurring in the park;
- Design and production of informative signs at nesting areas;
- Posting of produced signs at nesting areas particularly threatened by human activities;
- Raise awareness among relevant authorities about their responsibility that results from international conventions concerning migratory species and their habitats and ensure that politicians recognise sea turtles as a priority species;
- Training personnel in the identification of turtle parts and the implementation and enforcement of CITES and education on the serious impact that the trade in marine turtles has on wild populations.

### **6.4 Tagging**

- Identification of potential partners for the implementation of the programme in the park;
- Training on tagging procedures, turtle identification and monitoring methods of the identified working team;
- Purchase and distribution of tagging and monitoring material;
- Definition of the mechanisms for collaboration with the Mozambique Marine Turtle Working Group;

## **6.5 Community participation in turtle management**

- Conduct integrated surveys and management with local communities;
- Support the local community in the creation of micro-projects;
- Conduction training in turtle identification and conservation techniques of marine turtle as well sustainable use of marine resources;

## **7. Planning Activities for marine turtle monitoring and tagging programme 2007**

The marine turtle Programme will provide the park with the data collection form for the tagging, nest monitoring and turtle observation activities. The 13 sites identified in the first phase will be subject to a survey to establish the:

### **Boundaries**

Determination of the beach length in consideration of the long-term data collection. This must be representative of the local nesting beach.

### **Frequency**

The frequency is the numbers of the days per week that the activities, (tagging and nesting monitoring) will specifically set and adhered to from year to year.

Ideally, nesting patrols should be conducted daily; however, logistical considerations may preclude daily patrol.

### **Period**

The survey period should encompass the peak of the nesting season and should be designed to allow shifts in the peak of the season of the nesting season from year to year.

### **Nest verification**

Ideally, the personnel will be sufficiently trained to confirm nests by evaluating track and nest site characteristics. If there is a question whether a crawl ends in the nest, the presence or absence of eggs should be verified by hand digging.

### **Training**

Training should include observation of turtle in the water, turtle tagging and nesting turtle to ensure thorough understanding of the behaviour of the result in crawl and nest characteristics, this is the key to correctly identifying nests and false nest emergences.

### **Data that will be collected**

#### For each survey season

- Physical description of the boundaries
- Start and end dates of the patrol
- Number of days per week surveyed

For each patrol

- beach patrol
- patrol day
- patrol start and end time
- name of the personnel
- number of the nesting emergences (includes poached nests) by nesting zones if the beach is sub-divided
- number of non-nesting emergences (by zones if the beach is subdivided)

## 8. References

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