# An update on marine turtles in Eritrea, Red Sea

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## Introduction

Eritrea is located between latitudes 12°45'N and 18°03'N and 37°35'E and 43°07'E and lies on the eastern horn of Africa. Bordering the longest coastline of the Red Sea to the east, Eritrea has a mainland coast stretching over 1,300 km, adding to the 1,950 km of the additional coast of over 350 offshore islands, which include the offshore archipelagos of Dahlak and Hawakil and the Bay of Assab. Eritrea's extensive coast supports a rich array of natural systems including coral reefs, mangrove forests, beaches and seagrass beds, providing important foraging and breeding grounds for marine turtles. All of the species recorded in the WIO region occur in Eritrea's waters.

Five species of marine turtles reside in Eritrea's waters of the Red Sea. These include green, hawksbill, olive ridley, loggerhead and leatherback turtles. Three species – green, hawksbill and olive ridleys – nest. The green and hawksbill turtles are categorised by IUCN as endangered and critically endangered respectively, and are listed on Appendix I of CITES. The main threats to turtles in Eritrea are incidental catch in gillnets and trawlers, disturbance of nesting and foraging habitats, poaching of meat and eggs, lack of adequate protection, limited awareness and land-based development and pollution (Howe *et al.*, 2004; Teclemariam *et al.*, 2006).

The ECMIB Project Turtle Survey Team has been deploying the standard methodology of the regional conservation programme PERSGA for turtle surveys. At the beginning of the turtle survey, traditional ecological knowledge was explored and interviews were conducted with local fishermen and coastal residents which were then used as a basis for the survey. In this paper, we summarise the findings during the past five years of initial survey activities.

## Exploitation of turtle products

Although there are few records of harvesting, egg and meat of sea turtles are consumed locally by communities and fishermen at a subsistence level. Earlier, carapaces of hawksbill turtles were exported for ornamental purposes. Turtle oil is valued for medicinal purposes, as it is believed to cure several ailments. Some communities also use carapaces for carrying goods for the household. Although not sold in local markets, carapaces can be observed on walls of restaurants as souvenirs and curios with different paintings on them (especially in the coastal cities of Assab and Massawa). The blood of sea turtles is believed to treat skin diseases. Diabeties, flu, TB and asthma are some of the diseases believed to be treated with turtle products (fats/oil). The consumption of dried sexual organs of male turtles mixed with honey and butter is believed to have aphrodisiacal properties.

It is not common to get huge economic returns from turtle products, but sometimes turtles are killed for their fat to generate oil which is sold within and outside the country (e.g. Yemen) for large sums of money for medicinal purposes. This is illegally practiced on remote offshore islands. Most of the nesting beaches are found on offshore islands, and only those that are near fishing camps and coastal villages such as Berasole and Ras Tarma (southern Eritrea Red Sea) are easily accessed. The pressure on green turtle populations is high, since they are prized for their meat products.

## Nesting

Turtle nesting habitats have been recently identified and most of them are offshore. All of

the nesting beaches are inaccessible by cars/vehicles (offshore islands). The major nesting sites include Mojeidi, Dissei, Aucan, Dahret Sigala, Fatuma Island, Dehil, Urubia, Ras Tarma, Salafi (Berasole) and Gahro. The hawksbill turtle is the most common species in Eritrea and nesting has been recorded in more than 110 islands and coastal sites. The green turtle is the second most common species in terms of nesting. Little is known about the status of olive ridleys although they have recently (2004) been reported to nest. Loggerhead and leatherback turtles are relatively rare in Eritrea and there is no indication that they nest (Pilcher *et al.*, 2006a).

**Tagging**

47 and 96 nesting female hawksbills were tagged with a titanium tag (with a return address to Eritrean Ministry of Fisheries) during 2006 and 2007 respectively, in the Island of Mojeidi. Four hawksbills and one olive ridley were also tagged in different coastal areas of Eritrea. No tag return has been observed yet. The plan is to tag turtles, especially greens, on board shrimp trawlers in order to elucidate their migration routes.

**Incidental catch**

A total of 3342 cases of sea turtle incidental capture were reported during the ten years of record between 1994 – 2004 during fishing trips of industrial shrimp and fish trawlers operating in different fishing grounds of the Eritrean Red Sea. Green turtles were more frequently caught than the rest of the species. 1819 green, 133 hawksbill, 30 loggerhead, 39 leatherbacks and 3 olive ridley turtles were trapped as incidental catch. The remaining 1128 turtles were unidentified. Of the total, 690 were dead and 2462 were returned alive. The percentage survival rate of the incidentally caught turtles was 78 %.

A survey was also conducted by a sea turtle team within four Egyptian vessels from 09/12/04 to 12/02/05 to assess the potential threat to sea turtles in fish and shrimp trawlers. During the trawling operations, 21 sea turtles were incidentally caught, of which one green turtle was found dead and the rest alive.

Almost all the fishing gear used by the local fishermen are gill nets and hooks & lines; there was no incidental catch except in rare cases of net entanglement. The fishermen said that wide-mesh nets and many kinds of gill nets also entangle turtles. At most, three to four in a year are caught entangled in drift nets according to interviews conducted in December 2004. Most cases of turtle slaughter in the southern Red Sea region are due to entanglement of turtles in gillnets and driftnets. It is very common to see carapaces of killed green and hawksbill turtles along the coastline of the southern Eritrean Red Sea region.

**Management**

Although conservation and management efforts are underway in some areas of Eritrea including the offshore islands of Dahlak, Hawakil and Assab, the conservation status of marine turtles in Eritrea remains largely unknown. Management options to reduce incidental take of marine turtles in fisheries, notably trawlers and gillnets, include the use of excluder devices, reducing tow or soak times, and restricting use of threatening fishing gears in important turtle habitats.

**Policy**

The 1998 existing Eritrean fisheries proclamations No. 104/1998, prohibit direct harvest and domestic trade in endangered and protected species generally including marine turtles, their eggs, parts and products; and to protect important turtle habitats. As stated in Article 12,

1. No person shall fish for any marine mammal or other protected species in Eritrean waters.
2. Any marine mammals or other protected species caught accidentally shall be released immediately and returned with the least possible injury to the waters from which it was taken, whether dead or alive.

And according to the Legal Notice No. 39/1998 under Protected Species, Article 11,

All species of marine turtles are protected species for the purposes of article 12 of the Proclamation; and accordingly fishing for marine turtles in Eritrean waters is prohibited.

The regulation states that fishing vessels operating in Eritrean waters must restrict their fishing activity in authorised zones; for trawling, this is 4 miles from islands, 8 miles from the mainland coast, and the depth must be greater than 30m, where the probability of catching sea turtles is very low. Zoning and seasonality of fishing is worked out by the Ministry of Fisheries regulatory body. It also states that fishing vessels operating in Eritrean waters must use TEDs in all trawl nets to reduce the mortality of turtles and other megafauna. But this is not yet practiced for a variety of reasons. The use of poisonous chemicals and explosives to kill, stun or disable fish or other aquatic organisms in order to catch them more easily is strictly prohibited under the proclamation.

The Ministry of Fisheries has also issued a coastal policy that will regulate all activities along coastal areas. It will allow coastal developments 100m (setback) from a geologically fixed point along the coast.

**Action plan**

Eritrea developed a national action plan, a set of key management measures, that could eventually serve as a basis for a more specific action plan at a national level, but this is still a draft (2005).

The development of a National Action Plan for Marine Turtles in Eritrea (drafted in 2005) will consider all critical habitats. Those critical habitats that are outside protected areas can be stated as sanctuaries and be regulated. Although some areas are proposed as protected areas, they are not officially established yet. Marine turtles also feature prominently in plans to set aside marine protected areas which will safeguard these resources and leave behind a longstanding legacy for future generations.

**Awareness**

The ECMIB Project, in collaboration with national organisations, has conducted awareness seminars. Groups that have been the targets of these focused education and awareness programmes include policy makers, fishing industry, local/fishing communities, indigenous groups, media, teachers, students, military, navy and the police from different coastal areas of the country. Turtle posters and brochures in three languages (Tigrinya, Arabic and English) and banners were displayed and distributed. Seminars, general knowledge contest programmes among school children and sport activities were some of the turtle activities conducted which were broadcast on national TV and radio news. Clean up activities have also been carried out on nesting beaches by the Turtle Team of the project, students and youth.

To increase understanding of and to create awareness about sea turtle conservation in coastal and island communities and relevant governmental and non-governmental organisations, the Year of the Turtle 2006 was commemorated in the month of October 2006.

The ECMIB Project Turtle Team has deployed a seaturtle club in the town of Assab in collaboration with the National Union of Eritrean Youth and Students (NUEYS). The town of Assab is one of the active Eritrean coastal areas with a lot of fishermen and a landing site for fish. There is still an illegal market for turtle meat in the area. Teaching the children of these fishermen will indirectly help make elder fishermen aware of these issues. The ECMIB Project has equipped the 'Bisa Club' with some educational and recreational materials such as satellite dish and TV for turtle (environmental) documentary film shows.

School children have been and are displaying marine turtle posters, carapaces and skulls at several local and national occasions, such as sport, art and youth festival weeks.

Turtle activity news (technical information) including some findings and the unusual level of mortality papers have been posted on the IOSEA website, seaturtle.org and on the pages of the Eritrean Red Sea biodiversity website (http//: www.eritrearedsea.org).

**Capacity enhancement**

The ECMIB Project has trained its staff both inside the country and abroad with the Cyprus wildlife Society in 2005 on turtle nesting biology and conservation, and with Turtle Conservation Project (TCP), Sri Lanka in 2006 on socioeconomic aspects and conservation of turtles. More than 25 biologists were also trained in the theory and practice of sea

turtle biology and conservation in 2004 by Dr. Nicolas Pilcher, sea turtle biologist and Co-Chair of the Marine Turtle Specialist Group (MTSG), IUCN, during which the first record of olive ridley nesting was documented (Pilcher *et al.*, 2006b).

A four-day sea turtle field training course was given to 15 observers on board industrial shrimp/fish trawlers by the ECMIB project (Ministry of Fisheries) sea turtle conservation team. The academic training held at Dissie Island from 3 to 6 January 2007 was complemented with practical demonstrations during the day and at night. Each trainee was given a copy of the Indo-Pacific marine turtles and other marine mammals' identification key with photos, along with measuring tapes which can help them identify the species easily.

**Illegal trade**

All international trade is prohibited according to CITES (as Eritrea is a signatory). There are no cases reported to the Ministry of Fisheries on such incidents. Domestic illegal trade of turtles is forbidden according to the existing Eritrean fisheries regulations. There are rare reports that turtle products are sold illegally. However, implementation gaps still exist as few measures have been applied. Nevertheless, training and education/awareness programmes are continuing to reduce the incidence of illegal trade.

**Conclusion**

The survey activities conducted by the ECMIB Project have been successful in identifying the nesting sites of marine turtles. Although surveys and assessments have been carried out to some extent, it was not conducted on a regular basis. The absence of specific turtle programmes has resulted in fragmented turtle assessments. Additional surveys are necessary to identify the feeding grounds and migratory routes so that conservation efforts can be effective. Eritrea is pushing to strengthen cooperative management of shared populations within the region, and, where appropriate, formalise cooperative management arrangements at national and regional levels, which will develop, where appropriate, transboundary marine protected areas using ecological rather than political boundaries.

Although no major work has been conducted with indigenous communities so far, in the future it is planned that greater effort will be put into incorporating communities in conservation. Frequent meetings with the *Derrder* (Sultan) of the indigenous community of Afar has resulted in reduced levels of turtle killing in some areas.

Future plans include training of fishermen from different coastal villages of the Eritrean Red Sea on identification, nesting biology, conservation and turtle death mitigation techniques; conducting workshops for different governmental and nongovernmental organisations on how to save marine turtles; preparing training material in different local languages; and turtle handling manuals for students and fishermen. Efforts will be made to establish a library in the turtle clubs.

Finally, since the ECMIB Project was terminated in November 2007, the Ministry of Fisheries will continue the responsibility. The main challenge will be to identify available funding sources at a number of levels, including government and inter-governmental organisations (e.g. Ministerial, Global Environment Facility, UNEP, UNDP, Overseas Aid packages), non-profit organisations (e.g. WWF, IUCN, Ramsar), and private foundations.

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# Advances in sea turtle conservation in Kenya

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## Introduction

Five of the seven extant sea turtle species are reported to occur within Kenyan waters: green, hawksbill, olive ridley, loggerhead and the leatherback turtles. The green turtle *(Chelonia mydas)*, hawksbill turtle *(Eretmochelys imbricata)* and olive ridley *(Lepidochelys olivacea)* are the most commonly encountered species in Kenya (Wamukoya et al., 1997). However, the loggerhead *(Caretta caretta)*, and the leatherback *(Dermochelys coriacea)* are rarely sighted though past records indicate that they used to occur within Kenyan waters: with the first ever-confirmed leatherback stranding reported in 2007 (Wamukota, 2007).

Sea turtle populations in Kenya have been facing several threats, which have ranged from direct subsistence harvesting for meat and eggs, commercial harvesting for meat, oil and shells (Wamukoya et al., 1997; Church & Palin, 2003), incidental capture in both artisanal and commercial fishing activities to habitat alteration, degradation and loss. The status of sea turtle exploitation in Kenya spells a major challenge to conservation and management efforts especially given that a large percentage of mortalities are human caused and mitigation measures partly involve major socio-cultural as well as socio-economic shifts.

Despite sea turtles being classified as 'protected animals' under the Wildlife Act (Cap 376) and Fisheries Industry Act (Cap 378); legislation that prohibits and makes it an offence for any form of direct exploitation of the animal or its products under Kenyan laws, illegal harvesting and exploitation of the species still thrives unchecked. This trend is compounded by the lack of resources such as equipment, personnel and finances to implement the already established legislations. Furthermore, no legislation exist at present to protect key sea turtle habitats such as foraging or nesting grounds except for those falling within designated marine protected areas.

## Sea turtle conservation in Kenya

Sea turtle conservation efforts in Kenya are coordinated by the Kenya Sea Turtle Conservation Committee (KESCOM) Secretariat. The secretariat was founded in 1993 to fulfill the need for a national multi-sector partnership that aimed at bringing together all stakeholders from local