

Conservation of Migratory species of Sri Lanka

Sri Lanka is an island in Indian ocean. It is the last land mass in south of the world. Marine turtles and Migratory birds are the main migratory animals in Sri Lanka.

Conservation of Migratory Bird

Sri Lanka's Avifauna is one of the richest in the whole of Asia. This small island contains descriptions of 435 bird species including 110 migratory species. It is 26% of the total number of birds. During the Migratory period from November to February birds visit Sri Lanka. There are three main fly ways, Eastern, Western and via Andaman islands. Sri Lanka is a major migratory bird's point because it is the last land mass of the world.

The Department of Wildlife Conservation(DWLC) has declared many Protected Areas with special concerning of Birds such as Bundala National Park (BNP), Anaiwilundawa Sanctuary, Bellanwila –Aththidiya Sanctuary and Muthujajawela Sanctuary. Both Bundala National Park and Anaiwilundawa Sanctuary are Ramsar sites.

National birds ringing programme.

The DWLC organizes a National Birds Ringing Programme in BNP in every year. During the migratory period birds are ringed twice, one is on December and another is on February. 150 birds from different species are ringed at once. Field Ornithological Group of Sri Lanka assists to this. Last year four new migratory species were recorded. About 54 migratory species out of 110 of total migratory species are recorded in BNP. One bird species was recorded after 1947. The Dwlc hopes to initiate the birds ringing programme in Anaiwilundawa Sanctuary in next year.

In addition to that the DWLC is update the birds records by direct observations. The density of each bird species in a particular area is also recorded.

The DWLC conducts various public awareness programmes in bird conservation. A march through ganized Anaiwilundawa Sanctuary was organized for school children.

Conservation of Marine Turtles

Marine turtles have been roaming the world's oceans for about 190 million years. Today eight species of these ancient reptiles remain. Five species of these species regularly visit sandy beaches of the Island. All the five species are endangered and threaten.

The five turtle species are as follows.,

Green turtle (*Chelonia mydas*)

Hawksbill turtle (*Eretmochelys imbricate*)

Loggerhead turtle (*Caretta caretta*)

Leatherback turtle (*Dermochelys coriacea*)

Olive Ridley turtle (*Lepidochelys olivacea*)

In Sri Lanka all sea turtles and their products are fully protected under the Fauna and Flora Protection Ordinance. Anyone found to be violating the conditions of this ordinance is liable to face a substantial and/or prison term.

In-situ Conservation in Bundala National Park

Bundala National Park (BNP) is the southern boundary of the island. It is also the last southern land mass of the world. BNP is the first Ramsar site of Sri Lanka. This project is conducted eight kilometers along the sea beach in BNP. 16 volunteers from the adjacent villages are recruited as nest protectors. Night

patrolling is conducted by the DWLC. The turtle nests are covered with specially designed concrete rings to protect from human and predators such as wild pigs, jackals, crows, mongoose, Crabs and land monitors. After the incubating period the hatchlings naturally go to ocean through the door of the concrete ring. The hatchlings are counted by the empty egg shells.

The species and the number of turtles, No. of eggs and hatchlings, the length and the width of the turtle and other important facts are recorded. The data base is maintained.

Outside BNP along the beach at Hambanthota area also monitor under the DWLC. This study will help to find out the other hot spots which turtles nest outside the protected areas in the island.

Tsunami was badly affected to the turtles. Almost all the turtle nests along the southern beach have been destroyed. But after Tsunami the Department of Wildlife Conservation has started their duty and they started patrolling again on 28 December.

Rekawa and Kalametita

Rekawa and Kalametiya are turtle nesting hot spots. Both in-situ and ex-situ conservation practices are conducted by the DWLC with the assistance of Turtle Conservation Project (TCP).

National Aquatic Research Institute (NARA) is conducting a hatchery monitoring programme in Galle and Kaluthara Districts.

Yala National Park

Another in-situ conservation programme is conducted by the DWLC with the assistance of IUCN Sri Lanka. Turtles and turtles nests are protected. By the protectors. The same concrete rings which use in BNP are places around the

turtle nests. The trained nest protectors are employed from the surrounding villages. The DWLC conducts night patrolling.

National practices to minimizing treats of turtles

- The National Marine Turtle Conservation Action Plan will be published in 2005 by the DWLC. The working draft was updated at a one day workshop on March in collaboration with all stakeholders.
- Community participation for the turtle conservation - Community around BNP, Rekawa and Kosgoda beach, Kalametiya Wildlife Sanctuary, and Yala
- National Park involves in beach patrolling and in-situ turtle conservation activities. All stake holders were involved to prepare the Management Plan for the BNP.
- Youth participation in turtle conservation
- Community based Eco-Tourism activities in Rekawa and Kosgoda area.
- Fishing communities in down south area are educated to minimize the captureing and by catching of turtles. The following management activities and mitigation measures are taken.

Promoting long line fishing instead of drift gill nets in offshore fisheries- NARA

Banning Tammel netting in coral reef areas –NARA

Banning use of explosives and chemicals in marine fisheries- NARA

Banning of dynamite fishing –NARA

Declaration of Hikkaduwa and Peginon island Marine National parks and Barreef Sanctuary as Marine Protected Areas under theDWLC

Declared the shallow sea are (10 m depth) from Little Bass to Buthawa point as a fisheries management area in 2002.

Report on the Impact of the Tsunami on Natural Ecosystems of Sri Lanka: Lessons Learned and Implications for the Future

The tsunami that devastated the coastline of Sri Lanka on December 26th 2004, impacted several protected areas managed by the Department of Wildlife Conservation (DWC), namely Ruhuna National Park Blocks I and II, Yala East National Park, Bundala National Park, Hikkaduwa Marine National Park, Pigeon Island Marine National Park, Kudumbigala Sanctuary, Nimalawa Sanctuary, Lunama-Kalametiya Sanctuary, Proposed Rekawa Sanctuary and Turtle Refuge, and Kokilai Sanctuary.

This assessment report includes the impact of the tsunami on these protected areas and to make necessary recommendations for monitoring the recovery of these ecosystems as well as to identify short and long term restoration activities that need to be undertaken by the DWC to ensure the long term viability of these protected areas. While some of the work such as detailed mapping of the effected areas is still on going, the following were the main findings.

The protected areas that were significantly impacted by the tsunami were Ruhuna National Park blocks I and II, Yala East National Park, Lunama-Kalametiya Sanctuary, and Proposed Rekawa Sanctuary and Turtle Refuge. The Marine National Parks received little direct impact. However, they suffered from secondary impacts such as smothering of coral reefs by siltation resulting from turbulence created by wave action as well as runoff from land, and damage arising from man made structures such as fish nets, concrete pillars etc washed out into the ocean with the receding wave.

The impact on terrestrial ecosystems though considerable, was localized to low lying areas mostly associated with lagoons and estuaries. In Ruhuna National Park Block 1, the area impacted inclusive of the beach, was 790 hectares. Nine major sites of sea incursion were identified. These were Palatupana-goda kalapuwa, Kuda Seelawa, Maha Seelawa, Uraniya, Buttuwa, Beeru kalapuwa, Patanangala, Gona Lahaba and Kalliya, all of which are lagoons or bays with direct sea frontage. In Ruhuna Block II six main areas of impact were identified, namely, Yala wela, Pillinewa, Agara Eliya, Uda Pottana, Gajabawa, and Kumbukkan oya estuary. In Yala East, the Kumana lagoon was impacted by the tsunami wave. Apart from this, the Lunama-Kalametiya Sanctuary and Proposed Rekawa Sanctuary and Turtle Refuge were considerably damaged. In all of these areas the vegetation was impacted much more than large animals or birds. Three types of impacts on vegetation were identified. The most obvious was

the complete or partial uprooting and breaking of trees due to the force of the wave close to surrounding the shore, and along the central region of flooding, leading to death, complete drying and subsequent defoliation of trees. The other two types of damage were deposition of sand carried inland with the wave, and inundation with seawater, which heavily impacted the understorey vegetation such as grasses and herbs.

A number of fresh water tanks and water holes in Yala Block I were impacted to some degree by the tsunami. Pattiyawala, Diganwala, Yala Tank, and a number of smaller water holes were completely inundated, and the Patanangala and Uda Pottana tanks were breached. A few other water holes received minor incursions of seawater but were not impacted to any significant degree. While small patches of mangrove vegetation such as was in Maha seelawa were almost completely destroyed, the larger tracts as in Pillinewa, Gajabawa etc. were relatively intact with damage only to areas close to the sea.

The direct impact on animals was less pronounced compared to the vegetation. Very few large animals were found to have perished due to the tsunami. However, small saline sensitive animals such as land snails and frogs, as well as small mammals and reptiles such as rats, mice, snakes and lizards have been heavily impacted. However due to the patchy nature of the area affected and large population sizes of these groups, the overall impact on these species is likely to be minimal. Animals have also been indirectly impacted by the damage to vegetation, as these areas can no longer function as optimum habitats for them. For example, the flooding by seawater of the Buttuwa, Uraniya, Gona Lahaba, Yala Wela, Pillinewa, Agara Eliya and Uda Pottana plains has resulted in a significant loss of grasses and herbs, impacting species such as water buffalo, deer and hare. However, practically all the species of animals normally observed in these areas were observed already utilizing them, and the loss of fodder is likely to be similar to that caused by failure of rains, hence within the tolerance of these species. Some animals like birds small mammals and reptiles appear to have benefited from the damaged vegetation as they were observed to use the tangled masses of vegetation as nesting sites and hiding places. It was observed that most of the terrestrial ecosystems have already started to recover, especially the grasses. While many seedlings of herbs were observed, their recovery may be slower than that of grasses. Most tree species including mangrove vegetation also appeared to be recovering, unless they were completely uprooted. The detrimental effects of the tsunami on fauna, such as loss of grazing are likely to be transient. However, the changes in soil salinity and deposition of sand etc. may create conditions more favorable to particular species of plants over others. Therefore, long term monitoring of the vegetation and

documentation of any changes in structure and composition of these eco-systems would be important.

Another important finding of this initial assessment was that natural ecosystems have functioned as the first line of defense against the tsunami wave. Especially the sand dunes have withstood the force of the wave very successfully, and if not for them, the southern and southeastern coasts would have received a higher level of damage. For instance the Bundala National Park, which lies on the Southern coast, received very little damage due to protection from sand dunes. Even in the Ruhuna National Park and Yala East National Park, the damage would have been much more severe if not for the sand dunes. Other coastal and offshore ecosystems such as beach vegetation, mangroves, and coral reefs have also provided protection to the coastline where these ecosystems were preserved in a relatively good condition. On the other hand in areas where natural ecosystems have been degraded due to over utilization, the damage to the coastal areas has been more extensive. It has also become apparent that these natural ecosystems can offer a greater resistance against this kind of natural disaster rather than man made structures such as breakwaters and rip rap structures that are in place to prevent erosion. Furthermore these natural ecosystems in addition to providing protection against erosion and oceanic intrusions provide other services such as functioning as silt traps, breeding grounds for sea fish and shellfish, which benefit the small craft fishery.

Based on the findings of this initial study, number of recommendations as to what actions are needed to restore the natural ecosystems in the impacted protected areas. One general recommendation that emerged from all the studies is the need to remove artificial debris from all impacted areas. This action has become critically important in the off shore areas such as Hikkaduwa Marine National Park where the artificial debris that got washed out from the land has become a major threat to the coral reefs. For instance fishing nets that are entangled in the reef captures reef fishes and causes unnecessary fish mortality, while large objects that move around within the reef due to wave action tend to damage the reef. In some of the terrestrial areas, where structures such as hotels were situated, a large amount of debris has been scattered over a wide area, and should be removed as it decreases the aesthetic value of these wilderness areas. It was also noted that in some of the National parks such as Ruhuna and Bundala, the invasive cactus species (*Opuntia dillenii*) has washed ashore and is in the process of slowly establishing along the beachfront. Removal of this invasive plant was also identified as a short-term action as it is easier to manage it at this moment before it attains an unmanageable stage.

It was agreed that large-scale restoration work on terrestrial eco systems should not be undertaken immediately for several reasons. Tsunamis are a natural phenomenon that occurs once in several hundred years. While the impact on terrestrial systems appeared to be extensive on first sight, on closer study, it was observed that most of the vegetation was regenerating and recovering. Also, the damage to terrestrial systems does not pose an immediate threat to any major group of animals. Therefore it would be advisable to let the damaged areas recover naturally, without much interference. The recovery process should be monitored and properly documented, as there is practically no knowledge worldwide, on how natural tropical ecosystems respond to and recover in the aftermath of a tsunami.

The number of water holes and tanks that were impacted are a small fraction of the available fresh water resources for animals and will not pose a threat to any major group of animals. While the tanks that were breached need to be repaired, the water holes that were inundated will be monitored to assess the changes in water quality and fauna, and action taken if required.

It was also felt that information on the natural recovery process could be offered as a part of the visitor experience to the impacted National Parks, and to use this opportunity to create awareness among park visitors as to the impacts of the tsunami on the park, including the establishment of a tsunami exhibit in the Ruhuna National Park. It was also decided to carry out a limited amount of restoration work to facilitate functional needs such as clearing of small areas to improve road accesses and wildlife viewing. Finally it was decided to establish a long term monitoring program in selected sites of the impacted protected areas to systematically investigate and document the response of natural eco-systems to tsunamis and the recovery process.