



An adult female Olive Ridley Sea Turtle (*Lepidochelys olivacea*) returned to the sea without laying eggs. (Photo: Onishi)

SITUATION OF LARGE REPTILES IN THE AYEYARWADY DELTA AFTER THE CYCLONE HIT

by Shingo Onishi

Cyclone Nargis

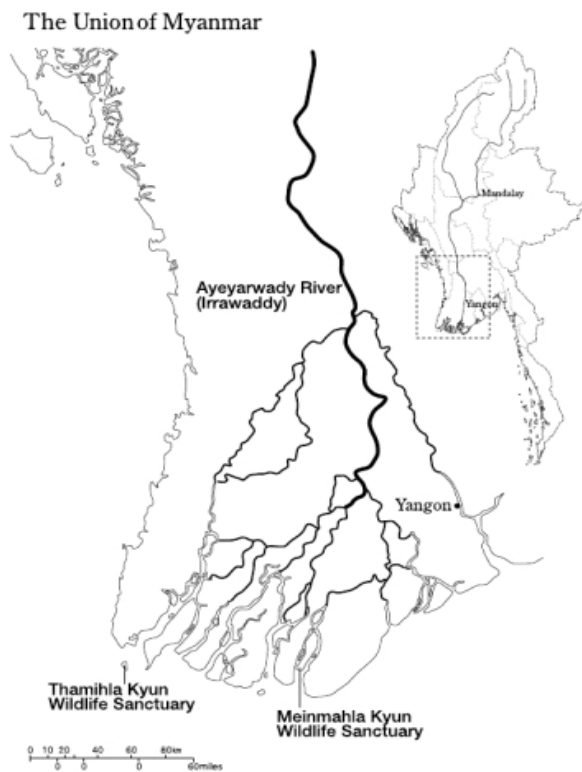
The devastating cyclone Nargis struck the southern part of Myanmar early in May 2008. The delta area of the Ayeyarwady (Irrawaddy) River was devastated. Yangon, the largest city in Myanmar, was also struck. However, Yangon citizens took action to rescue victims soon after the storm ended. Many relief supplies were donated and voluntary groups delivered them to victims as far and wide as possible.

Some foreign reporters reported that it would be very unlucky and terrible as the rainy season would come soon and the people would have to use rain water. However the local villagers regularly drink,

cook, bathe and wash in the natural water from rivers, ponds, wells and rain. Especially, rain water is quite hygienic. Moreover, heavy rain could wash away the water polluted with dead bodies and animal carcasses.

When the author visited Myanmar in July 2008, it was still very difficult to get the permission to visit the stricken area, but governmental organizations, many NGOs and various local groups were energetically trying to support the victims and even foreign visitors were welcome to join any relief works in Yangon.

It was in January 2009 when the author was finally able to visit the Ayeyarwady delta area. The area



was being rebuilt beyond imagination. The main roads were almost repaired and routes of buses and passenger boats were reopened. Markets and stores were full of foods and daily necessities. Large straw mounds were piled up here and there in paddy fields and rice mills were running. Many fishing boats were operating.

However, the disaster was real and these people are definitely survivors. Many of them lost family members, houses and properties, but they had to continue their livelihoods and restart their new lives. Revival activities should not be stopped yet and it is urgent to prepare for the coming cyclone season.

Saltwater crocodiles

There is an area in the Ayeyarwady delta where the aim is to conserve the mangrove ecosystem. This is the Meinmahla Kyun Wildlife Sanctuary (136.70 km²), located in Bogalay Township, Ayeyarwady Division. “Kyun” means “island” in Burmese. This flat island is one of the large banks of the Ayeyarwady delta and is covered with mangrove vegetation. The Forest Department makes special efforts to conserve Saltwater

crocodile (*Crocodylus porosus*) as it is the top predator of the food chain and thus, the symbol of the ecosystem there.

Many trees were felled, bent and broken by the cyclone. The forestry officer assigned to this sanctuary estimates that 70% of the tree crowns on the island were lost. In addition, a tremendous amount of debris drifted ashore from the upper reaches of the river and piled up on the island, as it is located nearby the mouth of the river. The Forest Department started to remove the debris and open channels inside the island. For the most part they did not remove dead and damaged trees or carry out any afforestation. And in fact, many trees are surviving and budding now and natural regeneration looks smooth.

Regarding the situation of the crocodiles, it seemed that they were not so badly affected by the cyclone. The author observed five larger crocodiles between about two and five meters in length (visual measurement) along the channels for six days. And many juveniles could be observed at night. They were staying or floating under tree branches along

the shorelines of channels. Many individuals looked to be less than 50 cm in length, so they were obviously born after the cyclone hit.

Sea turtles

Another significant conservation area is Thamihla Kyun Wildlife Sanctuary (0.88 km²), located in Ngapudaw Township, Ayeyarwady Division. This is a solitary island located about 10 km offshore the west end of the Ayeyarwady delta. The outer circumference of island is about 4.8 km and the land is a low platform shape, up to 34 meters above sea level, according to the fishery officer assigned to this island.

This island is the native place of two species of sea turtles: 1) Green sea turtle (*Chelonia mydas*) visits the island all the year round; and 2) Olive Ridley sea turtle (*Lepidochelys olivacea*) comes to the island between October and February to lay eggs on the beach. So, the visitors are normally adult females.

The island was hit by the tsunami of the Sumatra earthquake on 26 December 2004, and hit again by the high waves and storm of Cyclone Nargis in May 2008. The fishery officer estimates that sand about 90 cm in thickness was washed away by the storm actions and so the beach was reduced to 40% in width after these disasters. The bedrock was widely exposed on the beach and consequently the turtle egg laying area became narrower.

The fishery officer said that formerly a few mother turtles used to land almost every night. However, during the author's stay, four Green sea turtles and one Olive Ridley sea turtle landed over the course of six nights, and two of them returned to the sea without laying eggs. Thick roots underground were an obstacle to digging the hole for egg laying in one case. And the gravel was rather too large for shaping the hole in another case.



A semi-adult Green Sea Turtle (*Chelonia mydas*) that was caught in a fishing net is tagged before being released back to the sea (Photo: Onishi)

Some experts advocate driving posts into the ground of the beach in order to catch and retain the sand but the author hopes that natural conditions will be left alone and artificial structures should be avoided as much as possible as this island is a sanctuary.

Issues

The Ayeyarwady delta is a densely populated area and an essential part of the country for producing crops and fishery products. Therefore, good relationships between the villagers and government officials are very important for nature conservation. Both of the chief officers for the Meinmahla area and the Thamihla area have been engaged in conservation activities in their areas for more than 10 years and they seem to have the confidence of the villagers.

On Meinmahla Island, cutting down trees and fishing with illegal methods are strictly prohibited. As long as the local people follow the rules, they are allowed to operate small-scale fishing operations inside the island and can be officially supplied with some seedlings and wood, if necessary. However, some fishermen still carry out illegal fishing. For example, some of them put strong insecticide into the upper channel at high tide. Later, they catch the dead and dying fishes at the lower channel at low tide. In this case, crocodiles may be able to escape to the land to avoid poisoning, but they lose their food. Moreover, these fishes will be sold in markets and people will eat them. It is commonly believed by the local people that Meinmahla Island is the home of a powerful spirit who controls the coast and that crocodiles and tigers are its followers. Thus, people seldom hurt crocodiles. Even if somebody is killed by a crocodile, people will believe that he had offended the spirit. However, crocodiles rarely attack humans there.

The Forest Department has confirmed five crocodile breeding spots; two of them are located outside the island. There is evidence that their population may be increasing. Adult males often fight each other over territories, especially in the breeding season. During this period the crocodiles will naturally spread out their territory, and the risk of crocodile attacks will increase. The government and some NGOs are carrying out

afforestation activities not far from Meinmahla Island. We have to consider the survival of both people and crocodiles.

On Thamihla Island, there are small barracks and temporary fishermen's huts beside the conservation office. The soldiers stationed there and the fishermen cooperate for turtle conservation. During the author's one week stay, on two occasions fishermen brought in semi-adult turtles that were caught in fishing nets and soldiers found a landed turtle and came to report it to the officer. However, some human activities will inevitably have an impact on the turtles. For example, the large-scale trawl fishing takes about four hours for each operation. It is much longer than a turtle can go without surfacing for air. So, if a turtle is caught in the net, it will most likely not survive. Although circle hooks are obviously safer for turtles than J-hooks, this type of fishing tackle is not widely used yet. These matters are beyond the local fishery officer's control. Moderate administrative arrangements would be expected.

The island is mostly covered by the natural vegetation – a typical example of the maritime forest. However, someone let goats loose on the island and now their population is increasing in the wild. They graze on the lower plants as high as they can reach and thus, will cause serious damage to natural regeneration and bring about soil erosion. At present, the sandy beach is mainly calcareous, which is suitable for laying eggs by the two sea turtle species present. In order to maintain the ecosystem and the composition of the sand, the goats should be removed from the island as soon as possible.

Nature conservation officers may be struggling to carry out conservation efforts within the limited budget. Although 10 guardhouses on Meinmahla Island were collapsed by the cyclone, 6 temporary houses have already been rebuilt and staff are stationed there now. However, there tends to be a shortage of equipment and supplies such as boats, fuel, lights, batteries and so on to use for patrolling and to carry out scientific research such as censuses.

After the cyclone hit Thamihla Island, all of the staff escaped to the mainland. But they returned to the island within three weeks and settled in the temporary offices again. Whenever officers catch



Releasing baby Green Sea Turtles to the sea just after hatching. (Photo: Onishi)

turtles, they attach authorized tags to the turtles and release them. They also collect turtle eggs and transfer them to a temporary hatchery in order to prevent their being dug up by poachers or other mother turtles. The baby turtles are released just after hatching. The officers know that the longer the turtles are kept in the breeding pools the greater their survival rate. However, the pools have not been rebuilt yet and operating costs are pending now.

The conservation system for these aquatic animals is rather complicated. For example, the Forest Department registers Meinmahla Island as a sanctuary and arranges the management office and staff for crocodile conservation. However, the Department of Fishery may have the priority to take action for any matters regarding crocodiles outside the sanctuary. Moreover, they operate the crocodile farm for skin production in Yangon. So, the Forest Department has the experience for ecosystem maintenance and the Department of Fishery has breeding techniques.

The Forest Department also registers Thamihla Island as a sanctuary and lists all types of sea turtles as completely protected animals. However, it is the Department of Fishery that arranges the management office and staff there for turtle conservation. Flexible technical and financial cooperation between the departments is expected.

According to interviews with people from various villages, the local people do not seem to have the intention of capturing crocodiles and sea turtles for food. The crocodiles and sea turtles are protected both by the law and some traditional beliefs. However, human activities will surely have an influence on their survival. In particular, water pollution should be a cause for concern. Local people living along the rivers directly use river water for drinking, cooking, bathing and washing, and they throw all kinds of waste away in the rivers. Goods such as synthetic detergents, plastic bags, batteries contain chemicals are becoming more widespread, but a safe disposal system has not been established yet. There are also many mines

containing gold, copper and gemstones in the Ayeyarwady basin, so the influence of toxic substances from chemicals in these goods and mining operations cannot be disregarded. Large aquatic animals such as crocodiles, sea turtles, dolphins and so on are more dependent on natural water sources than humans are. So, their living situation should be the indicator for man's future

situation. An analysis of the water quality throughout the great Ayeyarwady River is urgently needed.

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A baby Saltwater Crocodile brought by a fisherman.(Photo: Onishi)