

Marine Turtle Newsletter

Nesting Sea Turtles at Sonadia Island, Bangladesh

M. Zahirul Islam, Foysal Ehsan & M. Mijanur Rahman

MarineLife Alliance, Judge Building, Baharchara, Sayeman Road, Cox's Bazar 4700, Bangladesh (E-mail: marinelife.al@gmail.com)

Five species of sea turtle are reported to occur in the territorial waters of Bangladesh: olive ridley (*Lepidochelys olivacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) (Groombridge *et al.* 1989, Rashid & Islam 2005). Illegal harvesting of turtle eggs, bycatch in offshore fisheries, alterations of sand dunes and nesting beaches have been recognized as the main threats to sea turtles in Bangladesh, and since 1980, nesting populations have declined due to severe exploitation of eggs and killing of adult turtles by fishing and other activities (Islam 1999). All sea turtles were listed in the revised Bangladesh Wildlife Preservation (Amendment) Act in 2010, giving them complete legal protection. Nevertheless, sea turtles continue to face severe threats along the coast and offshore areas of Bangladesh and many of the nesting rookeries remain poorly studied. In particular, there are few historical data available for sea turtle nesting in the Sonadia and Kutubdia Islands off the southeastern coast and in the Sundarbans, an extensive mangrove complex on the west coast. This report summarizes information on sea turtle nesting at Sonadia Island from 2005-2010 with some incidental data collected in January 2000.

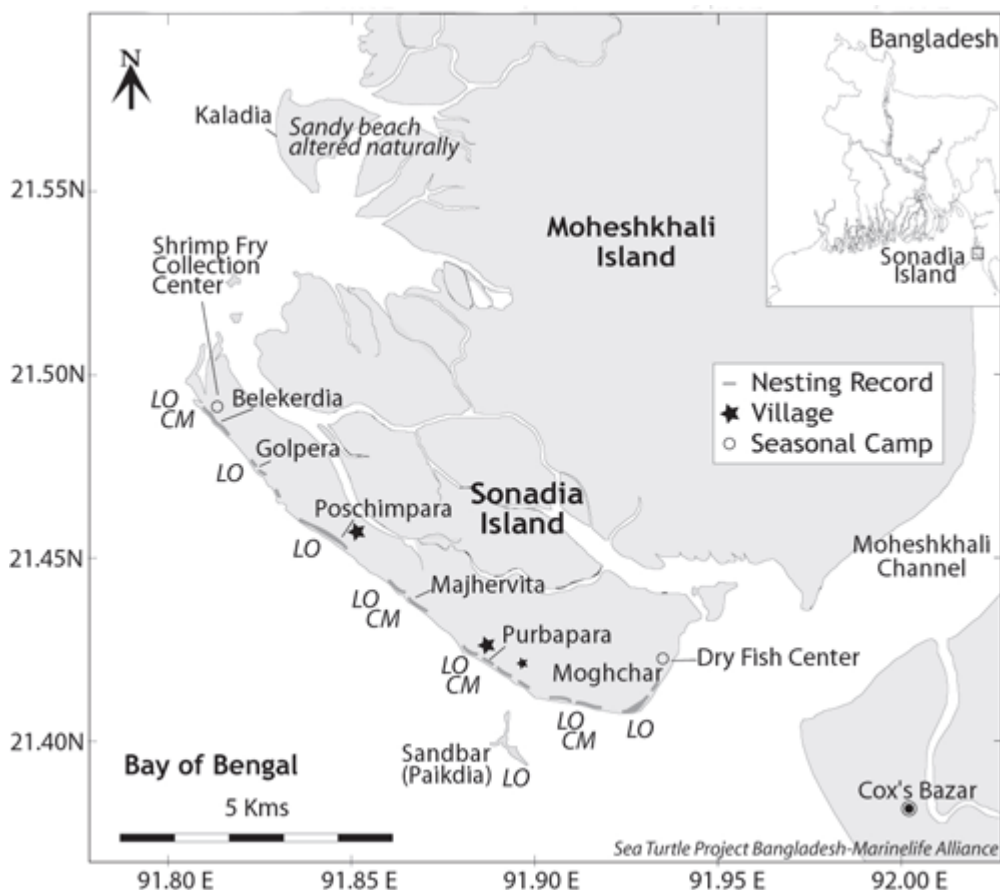


Figure 1. Nesting areas on Sonadia Island, Bangladesh.

Sonadia Island (21.49262° x 91.87529°) is located 3.5 km northwest of Cox's Bazar, Najirartek (Fig. 1). Prior to 1999, sea turtle data from Sonadia Island were collected opportunistically during the annual waterfowl censuses conducted in 1983, 1987 and 1989, and recorded low levels of nesting of olive ridley and green turtles (Rashid & Islam 2005). In January 2000, MarineLife Alliance conducted a preliminary nesting survey of a five km stretch of beach on the southern end of the island, between Moghchar and Purbapara. Surveys were conducted at every night between 6-9 January. During these surveys seven olive ridley and one green turtle nests were recorded in addition to eight false crawls of olive ridley (Islam 2001).

In 2005, MarineLife Alliance started a monitoring and conservation project. Night patrols of nesting beaches were conducted every night between 01 October and 31 May by 4-6 local people trained in surveying. Night surveys spanned >6 hours starting 3 hours before and ending 3 hours after high tide. Twelve km of beach were surveyed each night to record nesting activity and information on threats. In addition, local volunteers collected information on the turtle egg and meat trade and conducted daytime visits to the beach for further information. Surveyors were trained to identify species, successful nests, false crawls, habitat and egg relocation methods. During the monsoon period (June – September), surveys were continued with limited manpower (3 people) who visited the beach every second day. We also gathered data on nesting activities from poachers opportunistically during *ad-hoc* market surveys at nearby Moheshkhali area.

Season	Olive ridley nests	Olive ridley false crawls	Green turtle nests	Green turtle false crawls
6-9 Jan 2000	7	8	1	0
2005-06	155	38	0	2
2006-07	142	29	1	5
2007-08	162	27	3	6
2008-09	151	29	3	4
2009-10	158	28	2	4
Total	775	159	10	21

Table 1. Nesting activity of sea turtles on Sonadia Island, during 2005-06 to 2009-10 and a single survey in 6-9 Jan 2000.

Both olive ridley and green turtles nested on Sonadia Island (Table 1), although olive ridley nests were more numerous and more widely dispersed across the monitored beaches. Nesting by olive ridley turtles spanned October-April (Fig. 2). Olive ridley nests were recorded from Belekerdia in the north-west to Moghchar in the south-east (Fig. 1). Until 2008, olive ridleys were also recorded nesting at Kaladia beach, but the tidal surges associated with recent cyclones resulted in the loss of nesting habitat in this area. Olive ridley turtles also nested on a small nearshore sand bar off the west of the island known as an important roosting area for gulls and terns. The sand bar is exposed only seasonally and we surveyed during Oct - March in 2009-10. Most of the olive ridley nests were laid on the open beach, although a few were found in patches of groundcover vegetation (*Ipomea pes-caprae*, *Vitex* spp.). Belekerdia had the highest density of nests observed (42%) and the Majhervita had 33% of nests in recent years. The greatest number of nests laid in a single night was 19 olive ridley nests on 20 February 2006. No daytime nesting was observed. There were gaps in the daily surveys before 2007-08, due to inclement weather and reduced labor, so the nesting totals should be taken as minimum values until then. Green turtle nesting activities were recorded from June - October each year with nests recorded every season since 2006-07 (Table 1, Fig. 2). Green turtle activities were recorded on the south coast near Moghchar during 2000 and during 2005-10, most of the emergences occurred at Belekerdia and Majhervita (Fig. 1). Green turtles had a lower false crawl:nest ratio than olive ridley turtles, with primary disturbances consisting of predatory dogs, beach seine fishing, light disturbances and compacted sand after the monsoon (Table 1). Seven nesting olive ridley turtles with flipper injuries could not dig successfully nesting chambers even after several attempts.

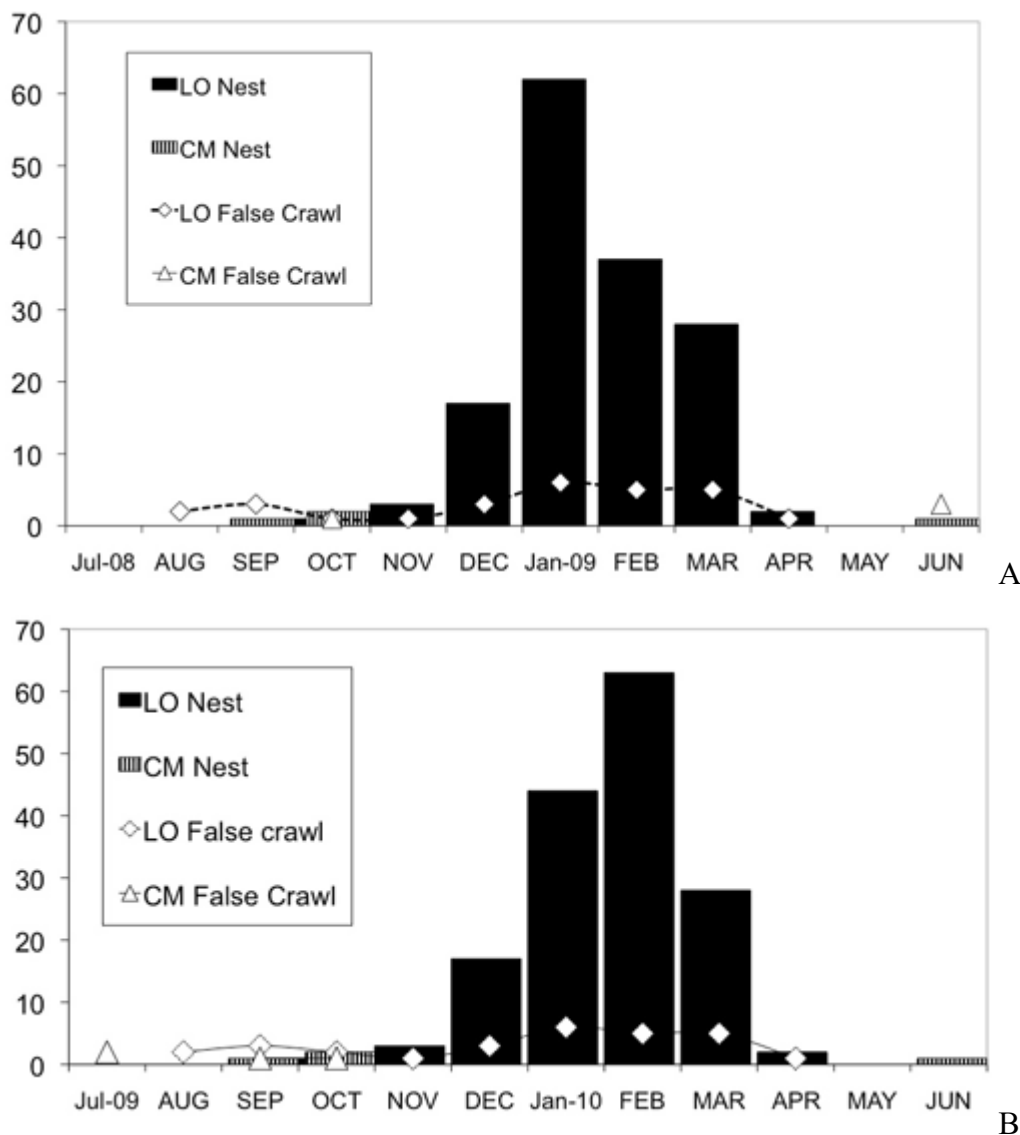


Figure 2. Seasonality of nesting activity of marine turtles in Sonadia Island in 2008-2009 (A) and 2009-2010 (B). LO = olive ridley, CM = green turtle.

The Island has a small human population, in one small and two medium villages named Purbapara, Paschimpara and Badarkhalipara, totaling 2500 people. The primary occupations of most families are fishing, cultivation and shrimp aquaculture, which have caused the destruction of much of the mangroves between Sonadia and Moheshkhali Island. The seasonal (October to March) Dry Fish Center (DFC) at southern end of the island and Shrimp Fry Collection Center (SFCC) at Belekerdia during monsoon (May - September) are operated by Moheshkhali people (Figure 1). The majority of Sonadian villagers are Muslims and do not traditionally eat sea turtle eggs according to the community, although this does not preclude the collection and selling of eggs. The major inland threats to marine turtles at Sonadia were (a) dog predation, (b) disturbances during shrimp fry collection, (c) beach seine fishing, (d) egg poaching and (e) alteration of the nesting beach by *Casuarina* plantation. Dogs predated five nests immediately after they were laid, three nests that were left on the beach for *in situ* incubation, and six nests relocated to the beach side hatchery. Five nesting olive ridley females have been killed by dogs since 2005 and dogs also attempted to breach the sea turtle egg hatchery that was set up to reduce predation levels. MarineLife Alliance is trying to reduce the dog population but this needs more attention. Most of the nesting beach area remains hazardous to sea turtles during late winter because shrimp fry collectors use kerosene lamps and torches while dragging their nets along the beach during high tide to catch larvae of *Peaneus monodon*. Around 300-400 seine nets are deployed from Purbapara to Belekerdia in clusters parallel to the shore at the intertidal zone, blocking access to the beach by nesting females. On 13 February 2010 a live olive ridley was trapped in a seine net although the fishermen cautiously released the turtle safely, likely a result of attending bycatch reduction training workshops. In nearby waters, gill nets are also used and can incidentally capture

reproductively active turtles. More than 2367 dead olive ridley turtles washed ashore during the 2005-10 seasons alone in Cox's Bazar beaches including St. Martin Island, Cox's Bazar - Teknaf Peninsula and Sonadia Island with 549 were recorded at Sonadia alone. Of twelve turtles examined post mortem, five had eggs (MarineLife Alliance 2010).

Parameters	Mean	SD	n	Range
<u>OLIVE RIDLEY</u>				
Clutch Size	115.0	23.5	449	48 - 204
CCL (cm)	64.8	3.5	71	58.65 - 73.95
CCW (cm)	62.8	3.2	67	57.37 - 73.95
Egg Weight (gm)	27.6	3.7	60	24.0 - 32.8
Egg Diameter (mm)	35.1	3.9	60	32.6 - 38.7
<u>GREEN TURTLE</u>				
Clutch Size	122.0	23.2	5	95 - 154
CCL (cm)	97.5	7.2	7	91.8 - 106
CCW (cm)	85.3	9.2	7	75 - 92
Egg Weight (gm)	42.5	3.7	20	40.3 - 43.5
Egg Diameter (mm)	41.5	3.9	20	40.5 - 42.8

Table 2. Morphometric data of sea turtles, clutches and eggs found on Sonadia Island, Bangladesh.

During 2005-10, 30 olive ridley nests and one green turtle nest were stolen before the nest patrols. Discussions with traders and observations in the local market in Moheshkhali indicate that an additional 23 olive ridley nests were collected for sale and/or consumption. It is presumed that prior to 2005, only 10-20 % of all nests produced hatchlings, and this was only because the eggs were not found by egg collectors. Ongoing efforts by MarineLife Alliance and Department of Environment to raise awareness about the protected status of sea turtles in Sonadia has decreased but not eliminated egg collection in recent years.

The expansion of *Casuarina* plantations on Sonadia in 2008-09 by the Forest Department is a potential threat to the sea turtle nesting habitat from Paschimpara to Belekerdia. In India *Casuarina* has been reported to cause a decline in olive ridley nesting (Mohanty 2002). Additionally, there are chances for developing tourism infrastructure by the Ministry of Aviation & Tourism, which may negatively impact turtle reproduction in future.

Currently, most nests are relocated 5 - 10 m from their original site, primarily to hide the actual location from egg collectors. This short-distance relocation resulted in 92.00% (N = 43; ± 5.22 SD) hatching success from olive ridley nests in 2009-10. In areas where dogs frequent the beach, nests are relocated to a fenced hatchery for protection. Ongoing nest protection is needed to ensure hatchling production. Additionally, more efforts are needed to manage beach seine fishing, feral dogs and *Casuarina* plantation to minimize impacts to Sonadia's sea turtles. Year round monitoring and protection of nesting beaches, eggs and turtles is vital. Relocation of nests will remain necessary until current threats are successfully mitigated. An additional proposal is to give special protection status to two km of beach at the north end of Sonadia Island, near Belekerdia, that will benefit not only turtles and their incubating eggs but also roosting waders, gulls & terns. This area is also principal nursery habitat for shrimp and fish, thus its protection will help sustain fisheries.

There is a new threat to sea turtles on Sonadia: the planned development of a port in the northern end of Sonadia, near Belekerdia. The federal government has approved plans for establishing a Deep Sea Port at Sonadia Island that would include 58 jetties totaling 11 km. Initiation of construction is dependent on international investments (US\$ 8.6 billion). Anticipated impacts of a large port on sea turtles include loss of habitat, increased boat traffic, water pollution, excessive noise and light pollution. Other protected species at Sonadia are at risk from the proposed port development, including spoon billed sandpiper and three other critically endangered wading birds, and many marine species including threatened coastal & marine cetaceans, including the finless porpoise (*Neophocaena phocaenoides*), Irrawaddy dolphin (*Orcaella brevirostris*) and bottlenose dolphin (*Tursiops aduncus*) (Islam 2009). There is concern about a lack of a transparent

Environmental Impact Assessment associated with the planned port, that the public is not being properly informed of the port's potential impacts, and that those with financial interests in the port are attempting to downplay Sonadia Island's biodiversity importance, despite the fact that Sonadia has been designated as an Ecologically Critical Area (ECA) by the government under Environmental Conservation Act, 1999 (Islam 2010). We recommend that the current development proposal be subjected to a full and transparent Environmental Impact Assessment before any construction work begins.

Acknowledgements. The authors and MarineLife Alliance are grateful to IOSEA, KNCF, US-FWS, WFN-UK for supporting to conduct sea turtle monitoring and conservation work. The first author also worked for GEF funded Coastal & Wetland Biodiversity Management Project, Department of Environment during 2006-07 and initiated sea turtle activity.

GROOMBRIDGE, B. & R.A. LUXMOORE, 1989. The Green Turtle & Hawksbill (Reptilia: Cheloniidae): World Status, Exploitation & Trade. Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna & Flora, Lausanne, Switzerland, 601 pp.

ISLAM, M.Z. 1999. Threats to sea turtle populations in Bangladesh. Technical Report. MarineLife Alliance, 1998, 28 pp.

ISLAM, M.Z. 2001. Sea turtles nesting & beach status at Moheshkhali and Sonadia area-rapid survey. Technical Report. MarineLife Alliance, 2001, 19 pp.

ISLAM, M.Z. 2002. Marine turtle nesting at St. Martin's Island, Bangladesh. [Marine Turtle Newsletter 96:19-22](#).

ISLAM, M.Z. 2009. Bangladesh's proposed deep-sea port at Sonadia Island: Another alarm bell rings in South Asia. Profile of the Month, Dec 2009, IOSEA website. <http://www.ioseaturtles.org/pom_detail.php?id=93>

ISLAM, M.Z. 2010. Bangladeshi government proposes port in ecologically critical area; SWOT Online Report-1, 2010. <<http://www.seaturtlestatus.org>>

MOHANTY, B. 2002. Casuarina forests ruin turtle nesting beaches in Orissa. Kachhapa 7: 20-21.

MARINELIFE ALLIANCE. 2009a. Sea Turtle Monitoring and Conservation along Coast of Cox's Bazar (2005-2009), Bangladesh, Final Report, 29 pp.

MARINELIFE ALLIANCE. 2009b. Marine Set Bag Net (MSBN) Bycatch Report. Draft Technical Report. Bycatch Study Program, 2007-09, 22 pp.

MARINELIFE ALLIANCE, 2010. Sea Turtle Monitoring and Conservation Report, South East Coast, Bangladesh (2009-2010) 31 pp.

RASHID, S.M.A. & M.Z. ISLAM. 2005. Status and conservation of marine turtles in Bangladesh. In: K. Shanker & B.C. Choudhury (Eds.). Marine Turtles of the Indian Subcontinent. Universities Press, Hyderabad, India. pp. 200-216.