SITE INFORMATION SHEET TEMPLATE

in support of a formal proposal to nominate a site for inclusion in the IOSEA Marine Turtle Site Network

The completed Information Sheet is intended to be submitted to the IOSEA Secretariat, through the national IOSEA Focal Point. As the contents will serve as the primary basis for evaluation of site nominations, responses should be as comprehensive as possible.

1. Date of submission (DD/MM/YYYY):
The date on which the Site Information Sheet was completed.

Revised 30 August 2016

2. Name and address of compiler(s), if not the IOSEA Focal Point
Name and contact information (including affiliation) for the individual(s) who prepared this information sheet, for formal submission through the national IOSEA Focal Point.

Name:	Mr. Maung Maung Lwin	
Functional Title:	Deputy Director	
Organization:	Department of Fisheries, Ministry of Agriculture , Livestock, and Irrigation (MOALI)	
Address:	Ministry of Livestock, Fisheries and Rural Development Compound, Nay Pyi Taw, Myanmar	
Email:	akthar.mgmglwin@gmail.com	Tel. / Fax: 0956 80764/ 095-067-408473

3. Country: *The name of the country in which the site is located.*

The Republic of the Union of Myanmar

4. Name of site: *The name of the site (alternative names should be given in brackets).*

Thameehla Island (Diamond Island, Thamihla Kyun)

5. Geographical coordinates
The geographical coordinates (latitude and longitude) of the approximate centre of the site, expressed in 'decimal degrees'. For example, the location of the IOSEA Secretariat in Bangkok is 13.763483°, 100.508157°. If the site consists of two or more discrete units, the coordinates of the centres of each of these units should be given. (Add any additional coordinates in a separate annex.)

Decimal Degrees 15.864214 , 94.276793

General location
Describe the general location of the site. This should include the site's distance (in a straight line) and compass bearing from the nearest significant administrative centre, town or city. The human population of the listed centre and its administrative region should also be stated. (See also the information requested under point 24: Site Map)

Location

Thameehla Island, Ngaputaw Township, in Ayeyarwady Division, is situated between the Bay of Bengal and the Gulf of Mottama (Gulf of Mattaban), at position 15°51.30'N and 94°17.30'E. (Source: www.ioseaturtles.org/pom_detail.php?id=77), at the mouth of Pathein (Bassein) River. (Source: http://www.iotn.org/pdf/IOTN10_2.pdf)

The island is about 10 km off the southern Arakan (Rakhin) coast, opposite the mouth of the Bassein River, Irrawaddy Division, to the west of the Irrawaddy Delta. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

Population and nearest significant administrative centre

There is no resident local population on the island. In the past (at least), the People's Pearl and Fisheries Corporation maintained a representative and a small number of labourers, and a policeman and a forest guard were resident. In 1983, there was a temporary military garrison on the island. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

The population of Ngaputaw township, which is situated on the mainland, is approx.168,509. (Data Source: Myanmar Census 2014).

The closest city in Ngaputaw township is Pathein, also called Bassein, situated 44.28 km away, with 286,684 inhabitants. It lies at the western edge of the Ayeyarwady River delta, on the Pathein (Ngawan) River, 190 km west of Yangon. (Population Data Source: Myanmar Census 2014)

In the remainder of this document, the codes that appear in square brackets alongside each of the titles below refer to sections of a separate document describing the evaluation criteria, which will be informed by the proponents' submission. Proponents are encouraged to consult the Evaluation Criteria document[1] for further explanation of the rationale behind each criterion and of the detailed information to be used for evaluation purposes.

7. Area [N3]

The approximate surface area of the site to be included in the network (in hectares or square kilometers). If the site is an island, indicate also the total surface area of the coastline directly relevant to turtle conservation. Area should correspond to the map provided under point 24.)

The total area of the island is 88 ha (0.9 km2) (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

The elongated island measures about 1,100 m by 730 m, with an outer circumference of 4.8 km (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

Thamihla Kyun is a wildlife sanctuary, classified as IUCN management category IV. (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf)

8. Physical features of the site [EB1- 4, S5, S6, N1]

Describe the principal physical characteristics of the site, including the marine turtle habitat types occurring at the site. List the ecosystem types included in the site (nesting beach, foraging habitat, reproductive habitat, migratory habitat) and the approximate area in hectares (or km^2) of each habitat type included. Indicate whether the site's physical attributes are shared by other sites in the country, or are exceptional/unique.

General characteristics.
The topography is undulating, with low cliffs to the south and west dropping to narrow, sandy beaches. The highest ground is approximately 35 m above sea level. The Island was damaged by bombs dropped by aircraft during the Second World War. The island is pock-marked with approximately 90 bomb craters.

With the exception of the north coast, a rocky reef surrounds the island, about 270 m wide, comprising sandstone and shale. There are three small rain-fed reservoirs on the island, the largest covering approximately 0.6 ha.
(Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

[1] Criteria for the Evaluation of Nominations to the Network of Sites of Importance for Marine Turtles in the Indian Ocean – South-East Asia Region, IOSEA Marine Turtle MoU Secretariat. http://ioseaturtles.org/sitenetwork-evaluation.php

Nesting habitats

Four separate beaches presently exist or previously existed on Thameehla Island:

- *Sutt Thaphu cove beach (western side of the Island): Length 91.44 m and width 45.72 m.*
- *Thamban cove beach (eastern side of the Island): Length 152.4 m and width 76.2 m.*
- *Lake Tae cove beach (northern side of the Island): Length 30.46 m and width 22.86 m (That cove beach is no longer a beach although at times new sand is deposited.*
- *Bengalar cove beach (southern side of the Island): (This cove beach has disappeared and only rocky areas are remaining.*

The Thameehla Island beach sand is mainly calcareous, which is suitable for sea turtle egg laying. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

In 2008 only two beaches remained suitable for turtle nesting on the island: Tham Ban cove beach and Sutt Thaphu cove beach, where marine turtle nesting occurred all year round (Source: http://www.ioseaturtles.org/pom_detail.php?id=77).

In 2009 a hatchery area was established on Tham Ban cove beach, situated at 15° 51.30' N and 94° 17.30' E (Source: http://www.iotn.org/pdf/IOTN10_2.pdf).

As of 2009 Thameehla island had two species of sea turtles nesting: (1) Green sea turtle (*Chelonia mydas*) visiting the island all the year round; and (2) Olive Ridley sea turtle (*Lepidochelys olivacea*) coming to the island between October and February to lay eggs on the beach. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

In 2014, there were still only two nesting beaches remaining:

- Sutt Thaphu cove beach (western side of the Island) measuring 300 m long and 24 m wide.
- Thamban cove beach (eastern side of the Island) measuring 360 m long and 40 m wide. .

Foraging habitats

In 2008 there were rich and diverse fauna and foraging grounds for turtles in the vicinity of the island's prime nesting sites. (Source: www.ioseaturtles.org/pom_detail.php?id=77) The surface area of these foraging habitats is unknown.

Migratory habitat

There are no data regarding the migrations of the marine turtles that breed at Thameehla Island, despite ongoing tagging and monitoring activity.

9. Ecological resources [EB1- 4, S5, S6, N1]

Describe the ecological resources at the site, including marine turtles and other noteworthy biodiversity. Describe the marine turtle species / management units occurring at the site, if they are known. Where possible, provide an abundance estimate for each marine turtle species/management unit (e.g. in terms of average number of turtles nesting annually or foraging). Evaluation Criteria EB1a and EB1b offer guidance on how to describe the relative importance of a site frequented by one or more marine turtle species. Indicate whether the site's ecological resources are shared by other sites in the country or are exceptional/unique.

Thamihla Kyun Wildlife Sanctuary, established in 1970 in the Ayeyawady Region, is governed by the Nature and Wildlife Conservation Division (NWCD) of the Forest Department. However, there is also a strong marine component to the conservation activities that take place there and the Department of Fisheries oversees those undertakings (Wildlife Conservation Society, Web page). The sanctuary currently supports nesting populations of Green and Olive ridley turtles.

Thameehla Island, immediately adjacent to the Ayeyarwady Delta, has been identified as one of the ecological hotspots in the region and has been recognised as a key biodiversity area since 2012. (Source: http://www.cepf.net/SiteCollectionDocuments/working_group/Draft_IndoBurma_Ecosystem_Profile.pdf)

Marine turtles

Management of turtle data recording and conservation practices, Thameehla Island turtle conservation and management station:

- Marine turtle staff maintains paper-based records of the collected data.
- Initially the data collecting formats were sent to Department of Fisheries Headquarters via the local Post Office.
- From 1986 to 1998, Department of Fisheries (DOF) Headquarters recorded the data in type written format on the paper, recording daily counts of numbers of nests, eggs,and hatchlings.

- After 1998 after a DOF trainee received training via SEAFDEC MFRDMD, the data collecting formats were changed. DOF Headquarters continued to record the data on paper but also keep the data in the computer.
- From 1999 until present year, Thameehla Island turtle staff are recording the number of nests, eggs, hatchlings, unfertilized eggs, undeveloped eggs and unhatched eggs also.

Species

Historically, three species of marine turtle have been recorded breeding at Thameehla Island: Green turtle, *Chelonia mydas*; olive ridley turtle, *Lepidochelys olivacea*; hawksbill turtle, *Eretmochelys imbricata.* The abundance of marine turtle nesting at Thameehla Island was originally surveyed over 100 years ago in the 1880s when there were thousands of green turtles, more than a thousand olive ridley turtles, and hundreds of hawksbill turtles nesting annually (Maxwell, 1911).

While Loggerhead and Leatherback turtles may forage in Myanmar waters, there is no evidence of their nesting on Thameehla Island.

As a result of worldwide poor understanding of marine turtle biology and population dynamics, excessive harvesting of eggs was supported and as a result there has been a drastic decline in the size of the annual nesting population at Thameehla to the present time. The annual green turtle nesting population is now measured in only tens of females annually, the olive ridley nesting population is now less that ten females annually and the hawksbill turtle is approaching extinction with no hawksbill turtle nesting having been recorded in recent decades (Thorbjarnarson et al. 2000; Limpus, 2012).

Thameehla Island is the primary index beach for monitoring marine turtle nesting in Myanmar (Department of Fisheries Turtle census data). The annual number of marine turtle clutches of eggs (eggs), the total number of eggs laid and the number of hatchlings released, Thameehla Island are recorded as follows: Green turtles – annex 1; olive ridley turtles – Annex 2. Figures 1 and 2 summarise the annual nesting abundance of green and olive ridley turtle breeding at Thameehla Island, respectively, since 1985.

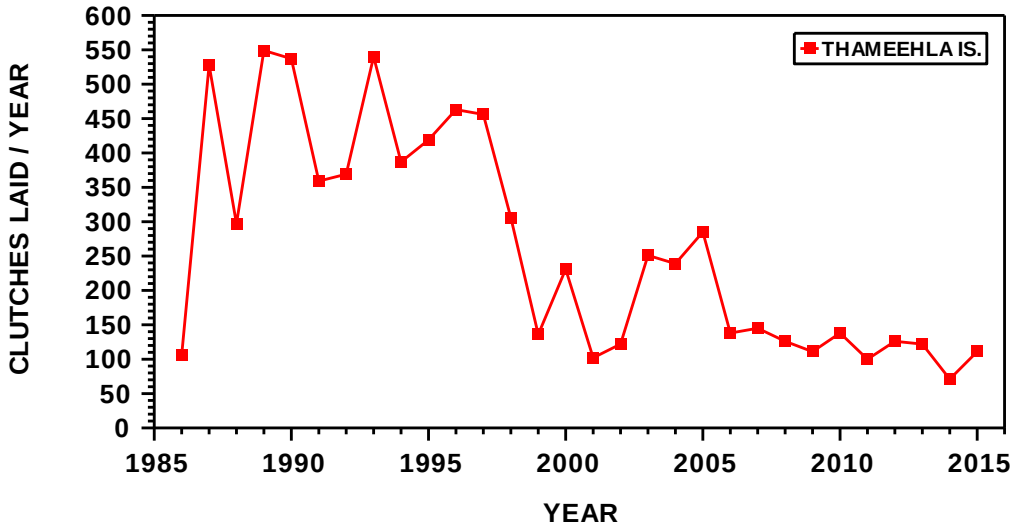

Figure 1. Census data for green turtle nesting on Thameehla Island spanning 30 years, 1986 -2015.

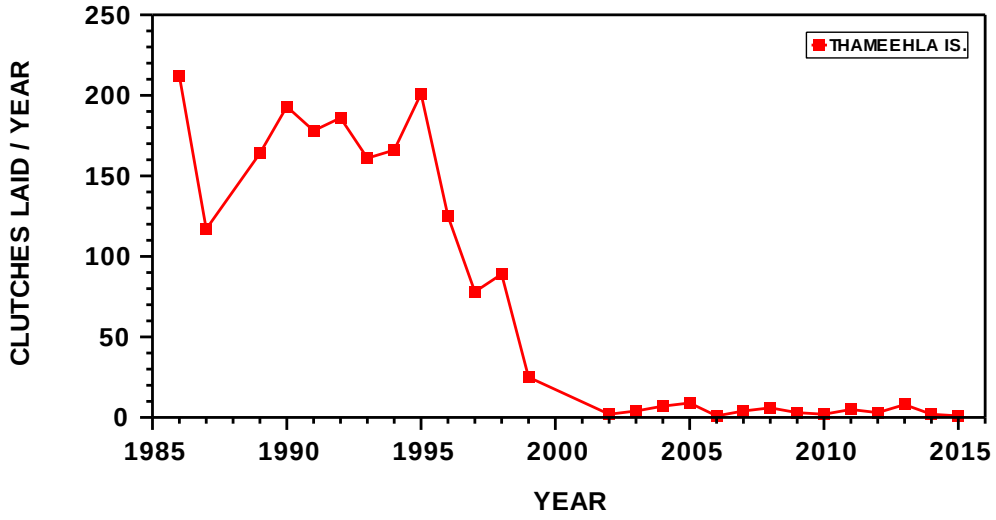

Figure 2. Census data for olive ridley turtle nesting on Thameehla Island spanning 30 years, 1986 -2015.

Figure 3 illustrates that Thameehla Island hatchery has the potential for good incubation success for turtle eggs throughout most of the year.

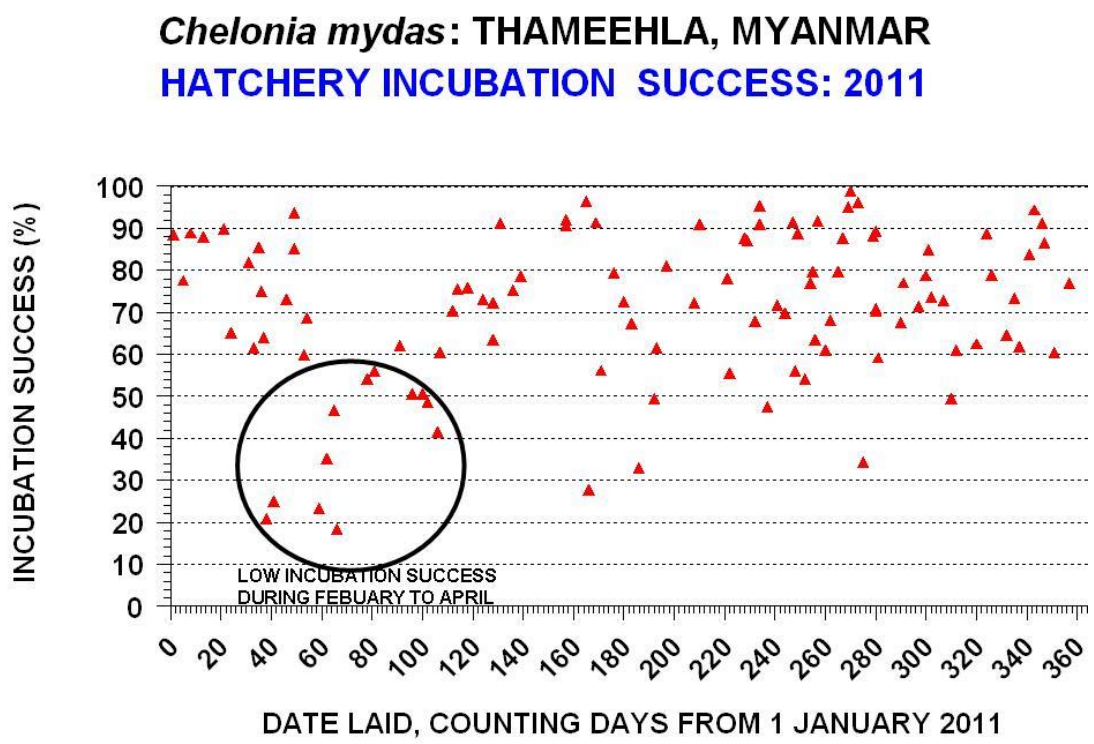

Figure 3. Hatchery incubation success on Thameehla Island, Myanmar, 2011.

Flora

The sandy beaches are backed by a typical beach vegetation with Hibiscus sp (many common names), Terminalia catappa (Bengal Almon or Indian Almond), Casuarina equisetifolia (Coast sheoak, Coastal she-oak), Beach *Casuarina* and Cocos nucifera (Coconut). The sheltered northern part of the island has good cover of Bombax malabaricum (Silk Cotton Tree), Ficus spp (Ficus or Banyan Tree). Lagerstroemia macrocarpa (L speciosa is synonym and common name is (Giant Crape-myrtle, Queen's Crape-myrtle), Xylia dolabriformis (Burma Ironwood), Terminalia belerica (Baheda) and Lannea grandis (Indian Ash Tree). Evergreen shrubs and bamboo constitute a fairly dense understory. The southern part of the island is more exposed, and supports a poorer cover with patches of open grassland and bare rock interspersed with evergreen thickets. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

Birds, including water birds

The birds found at the Thamihla Kyun Wildlife Sanctuary as of 2011 are as follows:

(Source: https://www.cbd.int/doc/world/mm/mm-nbsap-01-en.pdf; WCS Myanmar Programme);

- Brown-headed Gull (*Chroicocephalus brunnicephalus*) or/ and Black-headed Gull (*Chroicocephalus ridibundus*)
- White-bellied Sea-eagle (*Haliaeetus leucogaster*)
- Red-whiskered Bulbul *(Pycnonotus jocosus)*
- White-throated Kingfisher *(Halcyon smyrnensis)*
- Black-hooded Oriole *(Oriolus xanthornus*)
- Asian Koel *(Eudynamys scolopaceus)*
- Greater Coucal *(Centropus sinensis)* or/ and Lesser Coucal *(Centropus bengalensis)*
- White-breasted Waterhen *(Amaurornis phoenicurus)*
- Shikra *(Accipiter badius)*
- Little Egret *(Egtetta garzetta*) or/ and Great Egret *(Ardea alba)*
- Common Snipe *(Gallinago gallinago)*
- Common Myna *(Acridotheres tristis)*

- Lesser Whistling-duck *(Dendrocygna javanica)*
- Ruddy Shelduck *(Tadorna ferruginea*)

Reptiles and Amphibians

- Grass lizard *(Takydromus sexlineatus)*
- Chameleon (?)
- King cobra (*Ophiophagus Hannah)*
- Cobra *(Naja naja)*

Mammals

- Deer *(Axis porcinus)* released by Forest Department
- Cats *(Felis catus)* existing as pet.

Additional fauna survey work is warranted.

10. Cultural importance [S1]

Describe the cultural / religious / spiritual importance of the site (e.g. in terms of historical associations, spiritual traditions, religious significance etc.), as well as non-consumptive traditional beliefs/practices, in relation to marine turtles. If possible, provide references to published/unpublished historical or other accounts, which may give an indication of relative importance in a national context.

Most of the population in Myanmar are of the Buddist religion. A traditional belief among Myanmar people was that if they ate turtles, they would face mishaps. This has provided general local protection to the nesting turtles.

In this regard, Thameehla Island is not a cultural, religious or spiritual site of national importance. However, there is a small pagoda on Thameehla Island and limited numbers of people come to the Island for worship. On the mainland, there is a more famous pagoda named Maw Tin Sun pagoda, 5 miles from Thameehla Island, and many pilgrims come to worship at that pagoda.

11. Jurisdiction [G1]

The name of the government authority with: (a) territorial jurisdiction over the site, e.g. state/province, region or municipality etc.; and the name/description of the authority with (b) functional jurisdiction for conservation purposes, e.g., Department of Environment, Department of Fisheries, traditional owners, etc.

Territorial jurisdiction:

Hein Gyi Sub-Township, Ngaputaw Township, Pathein District in Ayeyawady Division.

Functional jurisdiction

As of 2014, the governance of the Key Biodiversity Area is under the management of the Department of Fisheries, Ministry of Agriculture, Livestock,and Irrigation and the Forest Department, Ministry of Resources and Natural Environment Conservation.

12. Management authority [G1]

Name, address and contact details of the body responsible for the direct <u>local</u> conservation and management of the site.

Fisheries Department, Ministry of Agriculture, Livestock and Irrigation. (New government changed the Ministry name in 2016.)

13. Current protected status and governance framework [G1, S4]

Describe any applicable legislation / regulations (or traditional laws / norms) relevant to the protection / conservation of marine turtles and their habitats at this site, and comment on their effectiveness. Include details of how any incompatible human activities and/or uses of land and sea at the site are prohibited or mitigated.

Mention any nationally relevant protected area status, international conservation designations and, in the case of transboundary sites, bilateral or multilateral conservation measures which pertain to all or part of the site. If a protected area or reserve has been established (at a national/regional level), give the date of its establishment and size. If only a part of the site is included within a protected area, the area of marine turtle habitat that is protected should be noted.

International designations may include sites listed under the UNESCO/World Heritage Convention, Man and Biosphere Reserve Network, Ramsar Convention, other site conservation networks, etc. Where appropriate, list the IUCN (1994) protected areas management category(ies) that apply to the site.

During the late 1800s there was an established substantial commercial trade in turtle eggs that continued well into the 1900s. In 1932, the father of U Khin Maung Lay was appointed as a Fisheries Inspector with the Colonial Administration. Following a dispute with the Administration, his father took up the fishing license for turtle egg collection on Thameehla Island in 1932. U Khin Maung Lay's father bought the fishing license at auction and operated the exclusive license at Thameehla during 1932-1941. The licensee did not allow others to come to the island to harvest turtles or eggs. The activity ceased in 1941 with the onset of World War II. The People's Pearl and Fisheries bought and hatched the turtle eggs from U Khin Maung Lay (Licensee) during 1963-1966. After that, People's Pearl and Fisheries took responsibility for guarding the Island until 1983. During the 1984-1985 period, no one governed the Island.

Governance framework specific to the island

The whole island (0.88 km^2) was declared a Wildlife Sanctuary in October 1970 with the creation of the Thamihla Kyun Wildlife Sanctuary. This framework implies species conservation, no settlement or resource harvesting allowed, with visitors permitted. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm) As such it enjoys a total legal protection (Source: http://www.istituto-oikos.org/files/download/2012/MyanmarProtectedAreas.Context_CurrentStatusandChallenges.pdf)

National governance framework

Burma Fisheries Act (III –1905): Included protection for the turtle nesting areas and turtles, and ban on trespassing on protected areas without official consent.

In 1924, the Government of Burma, Agriculture (Forest Department) Notification No.1 made an official announcement, not to trespass within 3 miles radius from the turtle nesting areas.

In 1989, Government promulgated four fishing laws. One law stipulated that no person should engage in harassing, catching, killing, storing, transporting, processing, or transferring of fishes that the Department has prohibited. In Myanmar Marine Fisheries Law (1990), mentioned in Chapter 1, Section (2), Subsection (r) it is stated that 'Marine Products mean fishes obtained from the sea, aquatic organisms, excreta, scales, bones, skins etc. The expression also includes Marine Turtle and eggs, Crocodiles and eggs, Crab, Ambergris, Oyster, Shell, Clam shell, Mussel, Coral, Sea sponges, Seaweed, Moss, Algae" etc. In chapter II, Section (40), it is stated: "No person shall search for and collect any Marine Products without a License ".(Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf)

1990: Sea turtles are protected under the Myanmar Marine Fisheries Law. (Source: http://www.iotn.org/pdf/IOTN10_2.pdf) (FYI – New Marine Fisheries Law is under revision as 11th draft and it was submitted to the Parliament for approval)

1991: Myanmar redrafted a new " Freshwater Fisheries Law " due to the substantially changed conditions.

1993: the Department of Fisheries enacted " Notification No 2 /93 for Sea Turtle Conservation. (Source: http://www.boblme.org/documentRepository/Nat_Myanmar.pdf)

As of 2014 this regulation was estimated to be very effective on land, while effectiveness on water was unknown (Maung Maung Lwin, pers. comm.).

International framework

1997: As a member of ASEAN, Myanmar signed an MoU for international cooperation for the conservation of sea turtles in Jakarta, Indonesia. This resulted in the extension of the conservation of sea turtles in Myanmar. (Source: http://www.ioseaturtles.org/pom_detail.php?id=18)

Myanmar is also a signatory to:

- Convention on Biological Diversity (CBD)
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- UN Convention to Combat Climate Change.
- Convention on Migratory Species / MoU on Conservation and management of marine turtles and their habitats in Indian Ocean and South-east Asia (CMS/ IOSEA)

IUCN classification of Thameehla Island: category IV (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf)

14. Land/sea tenure/ownership [G1]

Provide details of ownership of the site and ownership of immediate surrounding areas (e.g., state, provincial, private, etc.) which may have a bearing on the conservation of the site. Explain any terms that have a special meaning in the country or region concerned.

The entire area of the island is state-owned. The sanctuary notification conceded 1.1 ha to the Port Commissioner of Bassein, and allowed fishermen to seek temporary shelter in bad weather. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm))

15. Socio-economic values and land/ocean uses and activities within the vicinity of the site [EB4, G5, S2, S5, S6]

Describe, in general terms, the principal social and economic values of the site, including human activities and land uses (past, current and planned) within the vicinity of the site (e.g., agriculture, fishing, resource extraction, grazing, water supply, urban/industrial development, tourism, outdoor recreation, education and scientific research), irrespective of whether or not they are considered to directly impact the conservation of marine turtles. Some indication of the relative importance of each form of land use should be given, whenever possible.

Human presence

In 1983, there was a temporary military garrison on the island. As of 2009 there are small barracks and temporary fishermen's huts in the island. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

In the past, the People's Pearl and Fisheries Corporation maintained a representative and a small number of labourers; and a policeman and a forest guard were resident on the island.

The island has a sheltered anchorage of some 3-5 m in depth used by local fishers. (Source: http://www.arcbc.org.ph/wetlands/myanmar/mmr_thakyuwilsan.htm)

Tourism

On the mainland, the Maw Tin Soon Festival is one of most famous festivals in Myanmar, during the Myanmar calendar month of Tabaung (February) every year. The pilgrims go there via Pathein by a small steamer specially arranged for the festival. The Inland Water Transport department arranges the trips for the visitors. On the way they have to stop at Highgyi island in the Pathein outlet.

The visitors usually buy dried fish, dry prawns and sea products as souvenirs from the trip. The collectors can look for various sea shells on the shelf or can buy them at the stalls setup for these

particular wares. The boat-trip to the delta and out to sea is very pleasant with a fresh sea freeze. They can observe turtles that come to lay the eggs.

The trip allows pilgrims to get merit for their reverence and to enjoy the charms and beauty of the scene which the people cannot get elsewhere. The fanciful rocks of every design decorate the beaches all around.

There is a dearth of records to show numbers of visitors and, as pilgrims do not use formal entrances, there is no means of counting them. Where visitor volume is recorded along with revenue earned, the data do not appear to be stored in a readily retrievable manner. Therefore it is not possible to give a meaningful account of visitors to protected areas. (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf)

As of 2014, the island was being visited by very few tourists, students, researchers and technical people (Maung Maung Lwin, pers. comm.).

Fishing

During the dry season, more than 300 vessels may fish in the area and more than 50 vessels may fish there in rainy season. It is estimated that the number of fishermen in the vicinity are about 100. The fishing gear used include: trawl, trammel net, gill net and stow net.

The People's Pearl and Fisheries Cooperation handed over the Island to Department of Fisheries in 1995s and their data and information are not available.

16. Factors adversely affecting the site's overall ecological character, as well as threats to marine turtles and their habitat at the site [EB4, S2]

Describe the human and natural factors negatively affecting the ecological character of the site, both within and in the vicinity of the site. These may include existing, new or changing activities/uses, major development projects etc., which have had, are having, or may have a detrimental effect on the natural ecological character of the site. For all adverse and change factors reported, supply measurable/quantifiable information (if such data exist), as well as information on the scale, extent and trend of the change factor and its impact. For example, describe in terms of the percentage of coastline (or other area) modified/affected by a particular threat; for egg collection, describe in terms of number of nests, per species, per year. Mention also data-deficient threats, where a threat is known to be present but is not quantified. Collectively, this information should provide a basis for monitoring of ecological character of the site.

Many threats have been reported to occur on the island, but they are not quantified and it is often unclear how current they are.

Habitat degradation

Mangroves

As of 2008, although the island's beaches were comparably popular for the nesting of Olive ridley turtles, it has been assumed that less nesting of this species has occurred in recent years because of the deterioration of the mangroves. (The scale of mangrove loss is unquantified and not known). Olive ridley turtles generally prefer the enriched and fine sand beaches that are in from the lagoon with mangrove fringes.

Beaches

The island was hit by the tsunami of the Sumatra earthquake on 26 December 2004.

Additionally, on 2nd and 3rd May 2008, Thameehla Island was hit strongly by Cyclone Nargis. The hatchery which had been constructed on the beach and contained 21 marine turtle nests (1876 eggs in total) was totally destroyed because of the high tide. After the cyclone, marine turtles came to nest regularly but they did not lay eggs because of fallen trees, logs and other debris littering the nesting beaches. Decomposing dead dogs, buffaloes, cows and pigs from neighboring villages had also landed on the beaches. (Source: http://www.ioseaturtles.org/pom_detail.php?id=77)

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

(Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

As of 2008, a gradual decline of the nesting turtle population and number of clutches was found to be significant in the conserved areas. Of the four turtle nesting beaches originally existing on Thameehla Island, only two remained viable for turtle nesting. The other two nesting beaches sand had been totally lost. The reduction in nesting areas is thought to be contributing to the decline in turtle nesting. (Source: http://www.ioseaturtles.org/pom_detail.php?id=77)

Fishing

As at 2003 trawling had been identified as one of the greatest cause of sea turtle mortality in the Ayeyarwaddy division, in general (Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf). Each large-scale trawl fishing operation takes about four hours per haul, much longer than a turtle can go without surfacing for air, hence if a turtle is caught in a net it will most likely not survive.

During a one-week stay on the island in July 2008, on two occasions fishermen brought in juvenile and adult turtles (Green, Olive Ridley and Hawksbill turtles) that were caught in fishing nets; and soldiers found a turtle stranded and entangled in a ghost net.

In September 2008, three juvenile green turtles and one adult male green turtle were incidentally caught in a small-scale gillnet 1.6 km from Thameehla Island. (Source: http://www.ioseaturtles.org/feature_detail.php?id=268)

As of 2009 circle hooks were not widely used, and trawler practices were not being effectively controlled by local fishery officers. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

Reports of dead turtles recorded in the vicinity of the island are:

No.	Month/Year	Species	Sex	No. of Turtles	Fishing Gear
1	Sep-08	Green Turtle Juvenile		1	Drift Gill net
2	Apr-09	Olive Ridley Turtle Juvenile		1	Set Gill Net
3	Jun-11	Green Turtle Juvenile		2	Drift net
4	Jul-11	Green Turtle	male	1	Drift net
5	Jul-11	Green Turtle	female	1	Drift Gill Net
6	Aug-11	Green Turtle Juvenile		3	Drift Gill Net
7	Jul-12	Green Turtle	male	1	Purse seine
8	Jul-12	Green Turtle Juvenile		3	Purse seine
9	Aug-12	Green Turtle	female	2	Drift net
10	Oct-12	Green Turtle	female	2	Not available
Total Green: 16		**Total Olive Ridley: 1**			**TOTAL: 17**

As of 2014, according to Maung Maung Lwin, recent estimates of turtle by-catch are inexistent due to insufficient staff and lack of information. However, fishing was still occurring in the vicinity of the Island (Maung Maung Lwin, pers. comm). The following live caught turtles have been reported in recent years:

- Green turtle: one adult male and two Juveniles incidentally caught by gill net.
- Green turtle: two adult females incidentally caught by gill net and long line.
- Green turtle; one Juvenile trapped in ghost fishing net (gill net pieces)
- Hawksbill turtle : two juveniles incidentally caught by set gill net.

No poaching activity could be identified. As of 2009, according to interviews with people from various villages, the local people did not seem to have the intention of capturing sea turtles for food. The sea turtles are protected both by the law and some traditional beliefs. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

Water pollution

As of 2009 it was reported that local people living directly along the rivers used river water for drinking, cooking, bathing and washing, and they used to throw all kinds of waste into the rivers. Synthetic detergents, plastic bags, batteries that contain chemicals were becoming widespread, and there were no safe disposal systems. There were also reportedly many mines containing gold, copper and gemstones in the Ayeyarwady basin. An analysis of the water quality throughout the great Ayeyarwady River was thought to be urgently needed. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

17. Conservation and management interventions taken [G2, G3]

Describe conservation and management interventions already taken at the site to address threats. Note that some of this information may have been recorded in abbreviated form in the IOSEA Site Data Sheets, available online (www.ioseaturtles.org/reporting). Any application of coastal and marine spatial planning, or integrated coastal/marine zone management planning, involving or affecting the site should be noted.

Describe the management planning process for the site, including the state of implementation of any management plan that has been developed and approved for the site. Describe any other conservation measures taken at the site, such as restrictions on development, management practices beneficial to wildlife, closures of hunting, etc. (Note that information on any monitoring schemes and survey methods should be given under point 19, below.)

Where applicable, describe the involvement of local communities and indigenous people in the participatory management of the site, including co-management activities, surveillance and enforcement, and performance evaluation.

1993: Notification No 2/93 for Sea Turtle Conservation.

The objectives of Sea Turtle Conservation and Management (in general) are as follows:

- To restore developmental, feeding and nesting habitats;
- To make nesting beaches acceptable to turtle by eliminating the impact of artificial lighting through technology, ordinances (Law) and publication

(Source: http://www.boblme.org/documentRepository/Nat_Myanmar.pdf)

Effectiveness of that notification

As of 2014, public awareness on these issues had generally improved since these legislations were introduced, however its evolution at remote areas is not known (Maung Maung Lwin, pers. comm.).

With regard to Thameehla Island specifically, there are no management plans that define objectives, prescribe strategies and set targets for the island's ecosystem. Conservation and management is reported to be conducted on an ad hoc, opportunistic basis. (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf).

Breeding activities

From 1963, People's Pearl and Fisheries Cooperation took up a project to protect sea turtles on Thameehla Island. In 1986-87, the programme was fully reviewed and more hatcheries were established under the auspices of the Department of fisheries (DoF) with skilled technicians. As at 2003 the momentum of the activity had not been accelerated. (Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf)

2009: It is reported that "officers collect turtle eggs and transfer them to a temporary hatchery in order to prevent them from being dug up by poachers or other mother turtles" (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

2014: All clutches of eggs are transferred to a man-made hatchery surrounded by fence (Maung Maung Lwin, pers. comm).

Report from Limpus, C. 2012: The results showed that the sand at nest depth in the hatchery exposed to open sun was approximately 35^{o}C. This temperature is excessively hot for good incubation success of turtle eggs. Eggs incubating at this temperature can be expected to have a poor hatching success and resulting hatchlings can be expected to be in poor health.
Domestic cats entering the hatchery; and the use of probing rods to find eggs on the beach were identified as contributing to reductions in the number of hatchlings produced from the hatchery each year. (Source: Limpus, C. 2012)

Please refer to Annexes 1 and 2 for data on the number of turtles released per year and per species.

18. Conservation interventions proposed, but not yet implemented [G2, G3]

Provide details of any concrete conservation measures that have been proposed, or are in preparation, for the site, including any proposals for legislation, protection and management. Summarize the history of any longstanding proposals that have not yet been implemented, and differentiate between those proposals that have already been officially submitted to the appropriate government authorities and those which have not as yet received formal endorsement, e.g., recommendations in published reports and resolutions from specialist meetings. Also mention any management plan that is in preparation but has not yet been completed, approved or implemented.

No planned intervention could be identified at the site, beyond general goals stated in Notification No. 2/93.

- *To conserve and protect marine turtles and their habitats*
- *To conduct research activities*
- *To educate the fishers and local people*
- *To study foraging area*
- *To enhance the hatching rate*
-

NB: Dr. Colin Limpus prepared an "ASSESSMENT OF TURTLE CONSERVATION ACTIONS AT THAMEEHLA ISLAND, MYANMAR" within the framework of the IOSEA Technical Support / Capacity-building Programme in April 2012, which was addressed to the Department of Fisheries, Myanmar.

19. Current / proposed scientific research and monitoring [G4]

Describe any current and/or proposed scientific research on marine turtles and their habitats, as well as information on any special facilities for research. In particular, describe past and current marine turtle monitoring activities at the site (e.g., tagging, satellite tracking, genetic sampling, nesting and foraging ground surveys, ongoing beach monitoring, etc.). Describe the survey methodology in sufficient detail to allow for an assessment of its efficacy. Indicate the number of years of continuous monitoring, and whether data have been used to estimate trends in the size of the management unit. Cite relevant published papers in support of the submission.

It was reported in 2008 that the Department of Fisheries had taken responsibility and set up a Marine Turtle Conservation and Management Station on the island since 1986. (Source: www.ioseaturtles.org/pom_detail.php?id=77). The activities conducted there include:

2002-2008 Tagging of green turtles to try to identify migratory routes and feeding grounds: (Lwin 2010)

Background: Since becoming a member of SEAFDEC in 1999, Myanmar participated in the Second Meeting On Regional Tagging Programmed And Population Statistics On Sea Turtle held in Kuala Terengganu in Malaysia from 20 to 22 November 2000. In that workshop a resolution was passed to provide Myanmar and Cambodia with Applicators and Inconel Tags by MFRDMD under SEAFDEC in order to successfully carry out the activity of Tagging and Tracking of Sea turtle. Applicators and Inconel Tags were received Myanmar (DOF) in November 2001. (Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf)

Methods: PIT tagging activities were started in March 2004 on 25 green turtles at Thameehla Island. Data on recovered PIT-tagged sea turtles from Thameehla Island was also recorded. (Source: Myanmar National IOSEA Report, http://ioseaturtles.org/report.php)

In 2009, it was reported that "*Whenever officers catch turtles, they attach authorized tags to the turtles and release them.* (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

Results: A study was undertaken to examine the nesting turtle population. Turtles were tagged and released into the sea and any tagged turtles recovered were recorded. The results of this study showed that only 21.82 % of the nesting turtles could be tagged during the study period. Out of 280 green turtles that had been tagged at Thameehla Island from 2002 to October 2008 only 58 individuals had re-migrated up to 2008. This indicates that only 20.71 % of green turtles had returned to Thameehla Island. Out of 63 tagged turtles recovered from 2002 to October 2008, 33 green turtles nested at Thameehla Island. Even though we cannot draw any significant conclusion, the collected data would help understand the basic ecology of sea turtles around Myanmar. (Source: http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/107343/1/9thSeastar_15.pdf)

In total, 369 green turtles were tagged from 2002 to June 2014. Analysis of tag recovery results is still in process.

1986 – 2007 Regular monitoring of nesting, clutches and hatchlings. Lwin 2009

Methods

The number of sea turtle nests and total eggs laid on the beaches of Thameehla Island were recorded during the period from 1986 to 2007. Nesting sea turtles were observed and identified according to the descriptions of Smith (1973), Carr (1967) and Win Maung and Win Ko Ko (2002) at Thameehla Island during the period from 1986 to 2004. Some nests were excavated and transferred for incubation to hatcheries at selected sites. Data collection on hatching success of turtles at original nest sites was also carried out. Total egg number, unhatched egg number, damaged egg number and hatchlings released were recorded during the studied period.

Results

Almost all turtles recorded in Thameehla Island were green turtles (*Chelonia mydas*). A total of 7,461 nests and 693,929 eggs were recorded during the study period (Annex 1). The highest number of turtle nests was recorded in 1989 and was followed by those of the years 1993, 1990 and 1987. The highest number of total eggs laid was noted in 1989 and the least in 1986. The number of nests recorded during the study period was different across the years indicating the fact that the population of the nesting turtles was fluctuating as is normal for green turtle nesting populations. From 1986 to 2015, 272 nests, 25,694 eggs produced 18,620 hatchlings with an average hatchling emergence success = 72 %.

Temperature recorders and GPS units were supplied by the IOSEA Secretariat in 2013, for use at Thameehla Island and other field stations.

Extended research on population genetics (with the assistance of SEAFDEC)

(Source: www.ioseaturtles.org/pom_detail.php?id=77).

From Thameehla Island, 30 tissue samples of green turtles were obtained and dispatched to SEAFDEC/ MFRDMD for DNA analysis. (Source: Myanmar National IOSEA Report, http://ioseaturtles.org/report.php). The Myanmar green turtle nesting population at Thameehla island has been identified as an separate genetic stock from other green turtle nesting populations in the region (FitzSimmons and Limpus, 2014). Sampling for DNA Analysis:

Sampling Site	No. of sample	Sequenced	Re-sequenced
Thameehla Island	30	29	3
Coco Island	30	17	7

Source: Ms. Wahida Mohd Arshaad SEAFDEC-MFRDMD

20. Current / proposed communication, education, and public awareness activities [S3]

Give details of any existing and/or planned site-based programmes, activities and facilities for communication, education and public awareness, including training. Comment on potential opportunities for future educational and outreach activities at the site.

Awareness raising (undated)

- To increase turtle conservation awareness, the Ministry of Livestock and Fisheries distributes pamphlets related to public awareness and education in Thameehla Island;
- Education programmes on marine turtle conservation are implemented through newspapers, magazines and television in Thameehla Island. (Source: http://www.ioseaturtles.org/eleclib/Myanmarseastar.pdf)

This has included one pamphlet, 1 poster, 3 sign boards, a radio talk, one animation movie in both Myanmar and English languages and a movie made by Myanmar Radio and Television – 3 (MRTV3). Staff also conducted the training and talks occasionally.

These activities are directed to school children, fishers, local people, Department of Fisheries, Navy, Police Force, Forest Department, relevant stakeholders, universities, NGO and tourists

Training

SEAFDEC training

From 24 to 30 August in 1998, one Myanmar participant attended a Sea Turtle Reseach Conservation training course in Malaysia. As of 2003, two Myanmar's Department of Fisheries staff were able to participate in the Marine Fishery Resources Conservation including Sea Turtle Conservation and Management. training programmes conducted in Malaysia by SEAFDEC MFRDMD
(Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf)

The interaction between threatened species of international concern and fisheries resulted in DOF involvement in studies and investigation of reduction of turtle bycatch in fisheries. The focus is particularly given to the effectiveness on the use of the TEDs in reducing sea turtle mortality. Besides, the information and data on the sea turtles mortality has been collected in the region in collaboration with member countries of SEAFDEC and with the assistance of countries of IOSEA/MOU. SEAFDEC has also made a great effort and contribution to many international meetings and conferences through the presentation of its achievements during the course of promotion on the use of TEDs and circle hooks. SEAFDEC-TD convened an International Training Course on the Use of TEDs and JTEDs from 25 August to 8 September 2003. The course was attended by one participant from Myanmar

In November 2008, SEAFDEC TD conducted C-hook and J-hook training course in Yangon, Myanmar. Ttwenty three staff from Department of Fisheries participated.

Wildlife Conservation Society

The Wildlife Conservation Society has given training in methods of terrestrial and marine wildlife survey on Thameehla island. (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf).

Department of Fisheries

Reporting as of 2008, there have been many onsite training activities conducted by the Department of Fisheries through the Marine Turtle Conservation and Management Station on the island since 1986. (Source: www.ioseaturtles.org/pom_detail.php?id=77) as follows:

No.	Date	Training	Region	No. of Participants	Remarks
1.	21-31 Dec,2001	Training Course on Sea Turtle Conservation and Research	Gayetgyi Island, Bogalay, Ayeyarwaddy Region	17	
2.	21 Feb -2 Mar 2005	Training Course on Sea Turtle Conservation and Research	Gayetgyi Island, Bogalay, Ayeyarwaddy Region	27	
3.	29 Sep – 3 Oct 2005	On Site Training for Tissue Sampling and Tagging of Sea Turtles	Thameehla Island, Ngaputaw , Ayeyarwaddy Region	9	
4.	19-20 Nov, 2005	Research and Biological Science of Sea Turtles	Dawe, Tanintharyi Region	25	Only DoF Staff
5.	6 Nov, 2006	Year of the Turtles (2006) Workshop	Myanmar Fisheries Federation(MFF) , Insein, Yangon Region	103	
6.	24-28 Dec 2006	On Site Training on Platform Transmitter Terminals of Sea Turtles	Gadongalay Island, Bogalay, Ayeyarwaddy Region	11	
7.	18-25 Jan, 2007	Training Course on Marine Turtle Conservation	Sittwe, Rakhine Region	33	
8.	20-26 Feb, 2007	Training Course on Sea Turtle Conservation	Myeik, Tanintharyi Region		
9	15-19 Oct,2007	Training on Sea Turtle Conservation	Coco Island, Yangon Region	33	
10	15-27 Feb , 2008	Training Course on Sea Turtles Research and Conservation	Gadongalay Island, Bogalay, Ayeyarwaddy Region	24	

11	14-16 Nov, 2008	On Site Training Workshop of C-hook for Bottom Longline	Institutes of Fisheries Technology, Insein, Yangon Region	23		
12	9 -10 April 2009	Training Course on Incubation of Sea Turtle by Styrofoam Box	Gadongani, Bogalay, Ayeyarwaddy Region	12	Volunteer and DoF Staff	
13	28 Mar – 2 April, 2012	Training of Technical Support/Capacity Building	Myanmar Fisheries Federation(MFF),Yangon Region and Thameehla Island(field)	48	20 Thamee Hla	

2005 Training in genetic studies

In collaboration with DoF and SEAFDEC/MFRDMD the 'On-Site Training for Tissue Sampling and Tagging of Sea Turtle Course' was conducted from 29.10 to 3.11.2005 at Ayeyawady Division, Ngaputaw Township, and Thameehla Island. Nine trainees from DoF and 2 Experts from MFRDMD were involved. In this training course 9 participants from the Department of Fisheries took part. (Source: Myanmar National IOSEA Report, http://ioseaturtles.org/report.php)

IOSEA Capacity Building

Myanmar was the third Signatory State to benefit from the IOSEA Technical Support and Capacity-Building Programme, in the form of a comprehensive training course conducted in Yangon and at a coastal field site from 28 March to 2 April 2012. IOSEA Advisory Committee expert Dr. Colin Limpus conducted a series of structured lectures over three days at the headquarters of the Myanmar Fisheries Federation in Yangon.

The Yangon sessions were well-attended by about 45 participants, from various offices of the Departments of Fisheries and Forestry, as well as universities, NGOs, the navy and police. Nearly 20 participants carried on to Thameehla Island for the practical portion of the training workshop that was conducted on 1-2 April.

The workshop was made possible thanks to a grant secured from the Marine Turtle Conservation Fund of the United States Fish and Wildlife Service.
(Source: http://www.ioseaturtles.org/pom_detail.php?id=116)

Exhibition

From 8 to 15 March 2014, Heingyi Sub-township fisheries staff, including Thameehla Island Marine Turtle Conservation and Management staff, carried out an Environmental and Marine Turtle Conservation Educational Exhibition at Maw Tin Sun Pagada Festival in Ayeyawady Region in cooperation with Ayeyawady Big Three Symbiosis Project. Maw Tin Sun Pagada is only six miles far from Thameehla Island. This event has been supported by Keidanren Nature Conservation Fund, Japan.

21. Financial resources available for management of the site and other activities [G5]

Identify human and financial resources (including in-kind contributions) available to support immediate and near-term activities, as well as resources available to sustain site-based activities in the longer-term (e.g. in relation to monitoring, management interventions, surveillance and enforcement, and performance evaluation).

DOF staff from Marine Turtle Conservation and Management station, Thameehla Island, are responsible for monitoring nesting, protection of nests and release of hatchlings. There are some problems with staff recruitment because the site is remote and it is difficult to go there, with associated social welfare problems. In 2016, the new government increased the government staff's salary. The staff are suitably trained on site and supervised by the officer in charge of the Thameehla Marine Turtle Conservation and Management Station with some

necessary technical support and administrative decisions made by Headquarters in Nay Pyi Taw. Of the four staff working at that Island, some of them were recruited in 1986.

In 2001 applicators and Inconel Tags were provided to DoF by MFRDMD under SEAFDEC. (Source: http://www.ioseaturtles.org/UserFiles/File/elec_lib/Myanmar_Conservation%281%29.pdf
PIT tags and tag reader were provided to DoF in April 2003 by MFRDMD under SEAFDEC.

The Department of Fisheries received 4 temperature data loggers and 2 readers, and 4 GPS units in 2013; supplied by the IOSEA Secretariat.

22. Additional resource needs at the site [G5]

Where specific needs are identified (e.g. skilled personnel, specialised training, facilities, field equipment etc.) indicate how marine turtle conservation activities are presently impaired on account of their unavailability (e.g. inability to carry out regular surveys, to conduct certain types of research, to monitor certain parts of the range etc.) This information may be useful for compiling a general picture of deficiencies and resource needs that could be presented to potential programme sponsors.

It was reported in 2009 that nature conservation officers were struggling to carry out conservation efforts within the limited budget. There tended 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. (Source: http://indiaenvironmentportal.org.in/files/Situation%20of%20the%20large%20reptiles%20%20in%20the%20Ayeyarwady.pdf)

2011: Needs identified, in general (and not necessarily specific to this site)

- Inadequate human capacity,
- Insufficient research and management inputs
- Insufficient management and regular monitoring of turtle nesting beach to deter violation of conservation objectives

(Source: http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/138581/1/10thSEASTAR_19.pdf)

2016: The Nature and Wildlife Conservation Division (NWCD) has is reported to have insufficient financial and manpower resources and equipment to manage existing protected areas and guard against poaching. (Source: http://www.mekonginfo.org/assets/midocs/0002035-environment-biodiversity-and-protected-areas-myanmar.pdf).

To further conduct turtle conservation, budget is needed for research instruments like water quality measuring equipment, camera, laptop computer, GPS units, data logger, binoculars etc.,. Budget is also needed for research travel cost, professional fees, accommodation, meal and overhead cost. It intends to hold consultation workshops, meetings and interview surveys and these will need certain amount of resource. Staff capacity to undertake training and awareness trainings for the the community will be undertaken. These activities need a budget and support as well. International and local consultants are needed to strengthen the conservation activities.

23. References [e.g. S1, G2, G4]

List key references relevant to marine turtle records and to the site, including management plans, major scientific reports, and bibliographies. When a large body of published material on the site is available, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies. Reprints or copies of the most important literature should be appended whenever possible. Provide website addresses of references where available.

FitzSimmons, N. N. and Limpus, C. J. (2014). Marine Turtle Genetic Stocks of the Indo-Pacific: identifying boundaries and knowledge gaps. *Indian Ocean Marine Turtle Newsletter* **20**, 2-12.

Limpus, C. (2012). Assessment of turtle conservation actions at Thameehla Island, Myanmar within the framework of the IOSEA Technical Support/Capacity-building Programme. Report addressed to the Department of Fisheries, Myanmar. (IOSEA Marine Turtle MoU: Bangkok.)

Lwin, M. M. (2010). Tagging Study on Green Turtle (Chelonia mydas) at Thameehla Island, Myanmar. Conference Paper, Proceedings of the 5th International Symposium on SEASTAR2000 and Asian Bio-logging Science (The 9th SEASTAR2000 workshop): 15-19.

Lwin, M. M. (2009). Green turtle (Chelonia mydas) Nesting and Conservation activity in Thameehla Island, Myanmar. Indian Ocean Turtle Newsletter No 10.

Lwin, M. M. (2006). Paper of Regional meeting on the Progress of Research for Stock Enhancement of Sea Turtles, 28-29 November 2006, Kuala Terrengganu, Malaysia.

Lwin, M. M. (2005). Inconel and PIT Microchips Tagging on Green Turtle in Thameehla Island, Myanmar. International Symposium on SEASTAR-2000 and Bio-Logging Science, 13-14 December 2005, Bangkok, Thailand.

Lwin, M. M. and Thein Than, (2007). Current Status of Sea Turtle Conservation and Management in Myanmar. FAO-SEAFDEC Workshop on Assessing the Relation of Sea Turtle Mortality due to Fisheries in Southeast Asia, 19-23 March 2007, Bangkok, Thailand.

Maxwell, F.D. 1911. Reports on the Inland and Sea Fisheries in the Thongwa, Myaugmya, and Bassein Districts and the Turtle-Banks of the Irrawaddy Division, Rangoon, Government Printing Office. 57 pp.

Onishi, S (2009). Situation of large reptiles in the Ayeyarwady delta after the cyclone hit, Tiger Paper, Vol. XXXVI : No.1 January-March 2009, , Regional Quarterly Bulletin on Wildlife and National Park Management, REGIONAL OFFICE FOR ASIA AND THE PACIFIC (RAP), BANGKOK FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS.

Thorbjarnarson, J. B., Platt, S. G., and Khaing, S. T. (2000). Sea turtles in Myanmar: past and present. *Marine Turtle Newsletter* **88**, 10-11.

Other recent online publications of interest (including environmental impact assessments that mention Thameehla Island / marine turtles):

http://www.shell.com/about-us/contact-us/contact-myanmar/_jcr_content/par/tabbedcontent/tab/textimage_797973844.stream/1457598661180/38f3c2bae539d608598bf33d7968d64a08e67b94562ec8111434e1ed0ded8c80/IEE_Block_A4_FullReport_Eng_Dec15.pdf

https://www.ophir-energy.com/wp-content/uploads/2015/09/Ophir-Myanmar-AD-03-Block-3D-MSS-IEE-Report-Final-February-2015.pdf

http://www.ioseaturtles.org/pom_detail.php?id=132

24. Site map [N2, N3]

The most detailed and up-to-date map of the site available should be appended to the Site Information Sheet in digital and/or hardcopy format. The ideal site map will clearly show the area boundaries of the site, scale, latitude, longitude and compass bearing, administrative boundaries (e.g., province, district, etc.), and display basic topographical information, the distribution of the main site habitat types and notable hydrological features. It will also show major landmarks (towns, roads, etc.). Indications of land use activities are especially useful.

The optimum scale for a map depends on the actual area of the site depicted. Generally the map should have a 1:25,000 or 1:50,000 scale for areas up to 10,000 ha; 1:100,000 scale for larger areas up to 100,000 ha; 1:250,000 for areas exceeding 100,000 ha. In simplest terms, the site should be depicted in some detail. For moderate to larger sites, it is often difficult to show detail on an A4 sheet at the desired scale, so generally a sheet larger than this is more appropriate. While an original map is not absolutely necessary, a very clear image is desirable. A map exhibiting the above attributes will be more suitable for scanning.

Figure 3. Location map for Thameehla Island.

Annex 1

Summary of annual Green Turtle nesting, eggs laid and hatchlings released, Thameehla Island, Ngaputaw Township, Ayeyawady Region.

Year	Nests (nos.)	Eggs laid (nos.)	Hatchlings released (nos.)
Year 1986	106	5200	970
Year 1987	528	16073	8069
Year 1988	297	27900	10089
Year 1989	549	66908	35031
Year 1990	537	52300	44979
Year 1991	359	34334	26939
Year 1992	369	36900	21929
Year 1993	540	47902	34723
Year 1994	387	34461	30474
Year 1995	419	39613	31564
Year 1996	463	45928	36844
Year 1997	456	47312	40485
Year 1998	306	30679	24950
Year 1999	136	13651	11763
Year 2000	431	45673	43472
Year 2001	402	46680	43590
Year 2002	122	11549	9133
Year 2003	251	21016	11084
Year 2004	239	20737	11410
Year 2005	283	24703	13961
Year 2006	138	11659	6914
Year 2007	140	13773	9035
Year 2008	126	11234	7381
Year 2009	111	9470	6232
Year 2010	138	11794	6786
Year 2011	100	8360	5904
Year 2012	126	10803	7474
Year 2013	122	10273	7583
Year 2014	71	6022	3715
Year 2015	111	9132	6135
Total	**8,163**	**7,708,25**	**558,618**

Annex 2

Summary of annual Olive Ridley Turtle nesting, eggs laid and hatchlings released, Thameehla Island, Ngaputaw Township, Ayeyawady Region.

Year	Nests (nos.)	Eggs laid (nos.)	Hatchlings released (nos.)
Year1986	212	13200	2110
Year1987	117	17245	10039
Year1988	-	-	-
Year1989	164	27781	17704
Year1990	193	17900	9944
Year1991	178	17600	16112
Year 1992	186	18600	14408
Year 1993	161	15905	11727
Year 1994	166	16204	15479
Year 1995	201	20271	14054
Year 1996	125	12694	7989
Year 1997	78	8307	5970
Year 1998	89	9401	4797
Year 1999	25	4341	4163
Year 2000	-	-	-
Year 2001	-	-	-
Year 2002	2	201	126
Year 2003	4	383	69
Year 2004	6	572	373
Year 2005	9	895	441
Year 2006	1	112	93
Year 2007	4	429	157
Year 2008	6	595	410
Year 2009	3	328	218
Year 2010	2	194	120
Year 2011	5	464	153
Year 2012	3	283	119
Year 2013	8	767	438
Year 2014	2	174	73
Year 2015	1	105	95
Total	**1,952**	**204,951**	**147,381**