

Preliminary Assessment of Cetacean Catches in Coastal Waters Near Myeik and Dawei in Southeastern Myanmar

Prepared by
Tint Tun

In collaboration with
Brian D. Smith, Mya Than Tun and Nang Mya Han



A report submitted to the
Department of Fisheries, Myanmar, Wildlife Conservation Society
and Convention on Migratory Species



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Table of Contents

Excutive Sammary	---	1
1 Introduction	---	5
2 Study Areas	---	7
2.1 Myeik	---	7
2.2 Dawei	---	8
3 Definitions	---	9
4 Methods	---	10
5 Results	---	12
5.1 Local Names	---	12
5.1.1 Whale	---	12
5.1.2 Dolphins and Porpoises	---	12
5.2 Reported Sightings	---	12
5.2.1 Whales	---	12
5.2.2 Dolphins and Porpoises	---	14
5.3 Reported Strandings	---	14
5.3.1 Whales	---	14
5.3.2 Dolphins and porpoises	---	15
5.4 Reported Bycatch	---	15
5.4.1 Myeik	---	15
5.4.2 Dawei	---	16
5.5 Direct Catch	---	16
5.5.1 Myeik	---	16
5.5.2 Dawei	---	17
5.6 Landings and Sales	---	17
5.6.1 Myeik	---	17
5.6.2 Dawei	---	18
5.7 Consumption	---	21
5.8 Species	---	22
5.9 Fishing Gears	---	22
5.10 Traditional Beliefs and Attitudes	---	24
6 Discussion	---	25

7	Conclusions and Recommendation	---	28
8	Acknowledgements	---	28
9	References	---	29

List of Figures

Figure	Page
1. Map showing the Myeik and Dawei area on Taninthayi Division, Myanmar.	--- 6
2. Map showing the Thityawa and Kyaukpya villages, and Myeik area.	--- 6
3. Map showing the Maungmagan, Thabausaik, Sakhanthit villages and Dawei area.	--- 6
4. Myeik port.	--- 7
5. <i>Meekwet Zay</i> in Myeik.	--- 7
6. A fisherman on Thityawa fishing ground.	--- 7
7. Some artisanal fishing boats at Dawei <i>Kanna Zay</i> port.	--- 8
8. Fish market place at <i>Kanna Zay</i> in Dawei.	--- 8
9. Artisanal fishing boats at Maungmagan beach.	--- 8
10. Artisanal fishing boats at Thabausaik village.	--- 8
11. Artisanal fishing boats anchored at Sakhanthit village.	--- 9
12. An interview with artisanal fishermen in Myeik.	--- 11
13. An interview at the fishing vessels Check- point in Myeik.	--- 11
14. An Interview at Myeik.	--- 11
15. An interview at Thityawa village.	--- 11
16. An interview on Thityawa fishing ground.	--- 11
17. An interview on Kadan fishing ground.	--- 11
18. An interview at Sakhanthit village.	--- 11
19. An interview at Thabausaik village.	--- 11
20. Number of whale sightings reported by fishermen with reference to nearby islands.	--- 13
21. Irrawaddy dolphins sighted near the Thityawa creek mouth.	--- 14
22. A whale stranded at Pannataung beach near Thityawa village.	--- 14
23. A clear net-mark on the head of a dolphin.	--- 16
24. A dolphin with piercing wounds was put on sale at Maungmagan market.	--- 17

25.	A puncture wound observed on the back of a spinner dolphin.	---	17
26.	A dolphin on sale at Maungmagan market.	---	18
27.	Chopping a dolphin at Maungmagan market.	---	18
28.	Fresh dolphin meat on sale at Maungmagan market.	---	18
29.	Dried dolphin meat on sale at Maungmagan market.		19
30.	Fresh dolphin meat.		19
31.	Dried dolphin meat.		19
32.	Dried dolphin ribs and parts.		19
33.	Dried dolphin skin, fins and flukes.		19
34.	Salted dolphin parts on sale at Maungmagan market.		19
35.	Salted dolphin skin, fins and flukes.		19
36.	Fresh dolphin meat on sale at Maungmagan market.		21
37.	Some dolphin meat buyers at Maungmagan.		21
38.	Dolphins on sale and some buyers at Maungmagan.		21
39.	Some artisanal fishing boats at Thabausaik village.		22
40.	Some artisanal fishing boats at Thabausaik village.		22
41.	Inshore fishing gears registered at Longlon Department of Fisheries in 2003-2006.		23
42.	Township-wise no. of fishing licenses registered in 2003 – 05 in Taninthayi Division.		23
43.	U Shin Gyee shrine with some whale jaws offerings at a Dry Dock in Myeik.		24
44.	A whale jaw ornamented on top of the wheel house of a trawler.		24
45.	Map showing the Myeik, Dawei, Kyaikkhami and Thanlwin River.		27

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Executive Summary

During October 2005 and March 2006 two preliminary trips were made to assess cetacean bycatch and directed catch in coastal waters near the towns of Myeik and Dawei in the Taninthayi Division of Myanmar. Fish landing sites and local markets were monitored for cetacean carcasses and body parts. Skippers from bottom trawlers, artisanal fishermen, fish sellers and local people were interviewed about cetacean sightings, strandings, catches, traditional beliefs and attitudes about the animals. Thityawa and Kyaukphya villages near Myeik, and Thabausaik, Sakhanthit, Pantin Inn and Maungmagan villages near Dawei were visited as well as the fishing grounds at Thitya and Kadan near Myeik.

Whales are called “*Nga Wun*”, “*Nga Wun Gyee*”, “*Wai La*” or “*Wai La Nga*” along the coast near Myeik and Dawei. Fishermen from Myeik call all dolphins and porpoises “*Lann Shuu*”. Fishermen from Dawei call cetaceans without a beak “*Lann Shuu*” and those with a beak “*Lann Pha*”. In this report, “dolphin” refers to

both “*Lann Shuu*” and “*Lann Pha*” , but “porpoise” is used specifically for the finless porpoise.

Accidental entanglement of cetaceans in purse-seine nets, beach-seine nets, gill nets and long lines were reported. Except for a case in which a whale was accidentally entangled in purse seine net near the West Sular Island in 2004, no whale bycatch was reported. Crews reported releasing the whale but they were not sure whether it lived. Fishermen reported that dolphins usually became entangled in head rope of fishing nets by their flukes and that most accidental killing occurred in nearshore waters. Several fishermen remarked that dolphin entanglements were most likely to occur in “*Paik Kyee Hlay*” (net-fishing boats) and “*Wa Dan*” (purse seines). A fisherman from Sakhanthit village near Dawei reported catching about 20 dolphins while a beach seine fishing in 2000. But, no dolphin bycatch in their beach seine fishing for a few years may indicate a decline in the number of dolphin and porpoise in waters near Sakhanthit.

Opportunistic catch of dolphins was reported from the Myeik and Dawei areas. Some fishermen from Dawei will try to kill dolphins with a hand harpoon, locally called “*Zit*”, when they encounter them at-sea during fishing trips. Deliberate catching of cetaceans, including Irrawaddy dolphins *Orcaella brevirostris*, has been practiced for many years in the waters near Maungmagan. Some fishing boats carry hand harpoons. They will chase and kill dolphins opportunistically during other fishing activities or search for them if they are not encountered by chance. Some fishermen from Kyaikkhami Town in the Mon State are also reported to practice this type of dolphin killing.

Fish sellers estimated that two or three dolphins per month could be found in the *Mee Kwet Zay* (early morning fish market) in Myeik, and about 30 cetaceans of various species are put on sale per month during all seasons at the Maungmagan fish market.

The Maungmagan fish market is the main distribution point to local villages, including Dawei, for dolphin meat and body parts. Dried and salted dolphin meat,

skin, fins and internal organs were found every day at this market. Carcasses and body parts were delivered almost every day from fishing boats arriving to Maungmagan and nearby villages, such as Thabausaik and Pantin Inn. About 300 artisanal fishing boats of various sizes land at Thabausaik. Seven Indo-Pacific bottlenose dolphins *Tursiops aduncus* were sold on 9 March at the Maungmagan market. A dolphin was sold for 35,000 kyats (ca. 35 USD) on 30 October 2005 at the *Mee Kwet Zay* in Myeik.

During fish market and landing site surveys carcasses of 13 Indo-Pacific bottlenose dolphins *Tursiops aduncus*, one Indo-Pacific humpback dolphin *Sousa chinensis* and three spinner dolphins *Stenella longirostris* were observed at the Maungmagan market. Five Indo-Pacific bottlenose dolphins and three Irrawaddy dolphins *Orcaella brevirostris* were reported sold by fish sellers from the Maungmagan market. One finless porpoise was reported sold at this market by Nang Mya Han, Professor of Marine Science at Myeik University. Two unidentified dolphin carcasses were reported sold at both the Myeik *Meekwet zay* and Dawei *Kanna Zay* markets.

Some fishermen reported banging two iron bars together underwater to scare dolphins away from their fish catch and interfering with fishing operations. Cetacean bycatch and directed catch appear to be most common in the coastal waters near Dawei. All information on cetacean catches reported by fishermen was from nearshore waters. Net entanglement and deliberate killing by hand harpoon appears to be the most common source of human-caused mortality. Although bottom-trawlers are the most numerous offshore fishing vessels operating from the Taninthayi Division, no cetacean bycatch was reported in this fishery.

Based on this preliminary study provisional conclusions are that (1) seine nets, gill nets and hand harpoons are the main threats to the small cetaceans in Myeik and Dawei waters; (2) consumption of cetacean meat is probably localized in Maungmagan and neighbouring villages; and (3) cetacean catches appear to be on the order of at least a few hundreds per year from vessels originating in the Dawei area, and at least low tens per year from vessels originating in the Myeik

area. Public education on the conservation of cetaceans and the prohibition on their killing and the sale is urgently needed. Additionally, a systematic survey for coastal cetaceans between the Thanlwin River mouth and Myeik in the Mon and Taninthayi Divisions is needed to investigate species occurrence, abundance and distribution.

1 Introduction

The greatest threat to whales, dolphins and porpoises is "bycatch" and at least 300,000 whales, dolphins and porpoises in the world's oceans are killed in fishing gears each year. At this rate, if nothing is done, several species and many populations will be lost in the next few decades (WWF, 2006).

The International Whaling Commission (IWC) declared north of the latitude 55°S of the Indian Ocean as a Sanctuary for Whales in 1979. The Sanctuary not only protected whales but also promoted research on cetaceans.

The Union of Myanmar is a coastal country of the Indian Ocean. During February and March 2005 a survey for coastal cetaceans was conducted between Kawthoung and Myeik in southeastern Myanmar by a team of 12 international scientists and conservationists (including four from Myanmar) as a part of a Training Course for South Asian Scientists and a Population Assessment of Coastal Cetaceans in the Bay of Bengal sponsored by the Convention on Migratory Species, Whale and Dolphin Conservation Society and Wildlife Conservation Society (Mya Than Tun and Han Win, 2005; Smith 2006). As part of the same project, two trips were made to assess cetacean catches in coastal waters near the towns of Myeik and Dawei (Figure 1, 2 & 3).

Myeik was the focus of the first field trip due to an Indo-Pacific bottlenose dolphin *Tursiops aduncus* carcass collected from a local market and kept at a company's cold storage in Myeik (Nang Mya Han and Tint Tun, 2004) and another carcass of the same species recorded in February 2005 by the Myanmar team (Tint Tun, unpublished). There was also concern about potential bycatches of Irrawaddy dolphins *Orcaella brevirostris* and finless porpoises *Neophocaena phocaenoides* due to the large number of artisanal gill net fishing boats which were recorded in nearshore waters during the March 2005 survey referred to above. During the first trip, information was received about directed killing of small cetaceans in the Dawei area which led to a focus on this area during the second trip.

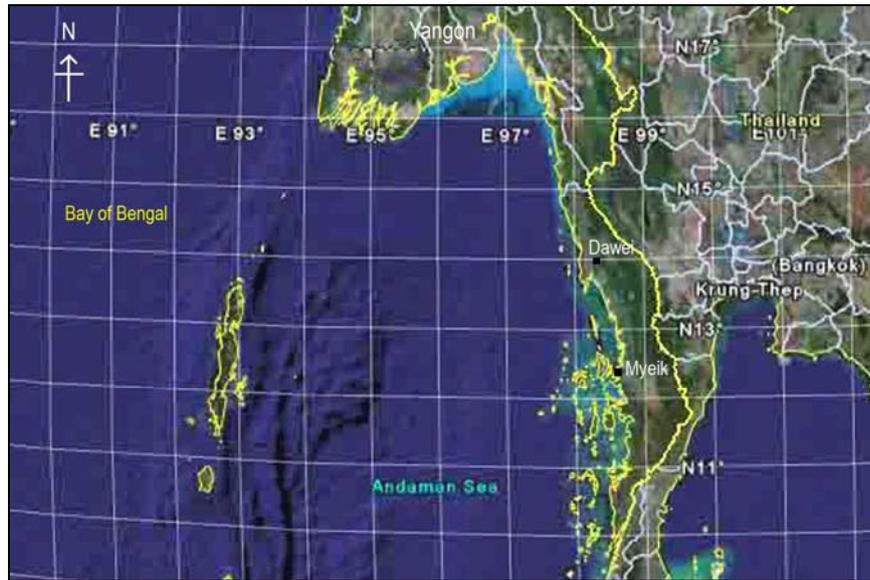


Figure 1. Map showing the Myeik and Dawei area on Taninthayi Division, Myanmar.

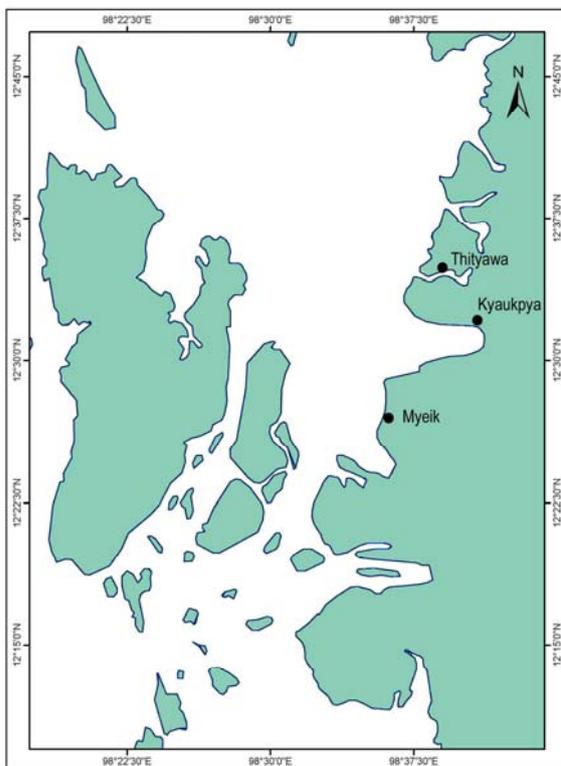


Figure 2. Map showing the Thityawa and Kyaukpya villages, and Myeik area.

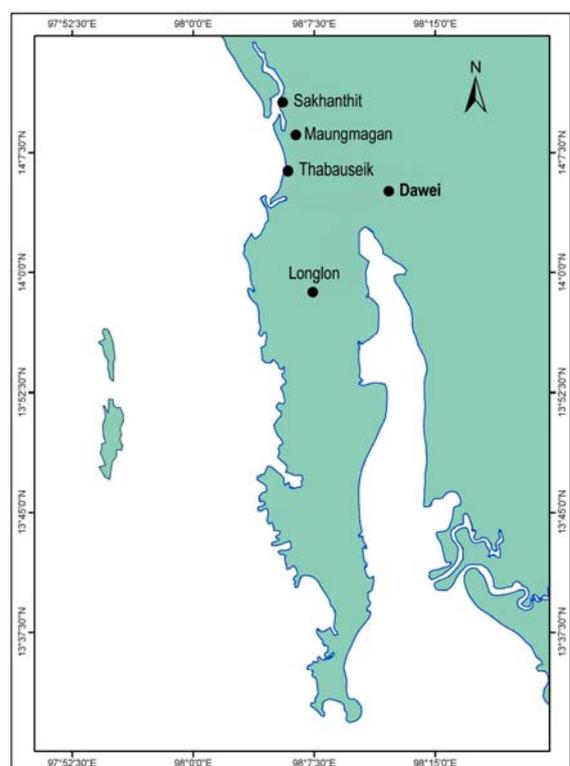


Figure 3. Map showing the Maungmagan, Thabauseik, Sakhantit villages and Dawei area.

2 Study Areas

2.1 Myeik

The town of Myeik is a busy port for coastal traffic and fishing in the Taninthayi Division. The Myeik (also known as Mergui) Archipelago comprises more than 800 islands and it is known for its rich natural



Figure 4. Myeik port.



Figure 5. *Meekwet Zay* in Myeik.

resources. Myeik port is always busy with fishing, cargo and passenger boats and receives occasional large vessels (Figure 4). Some small artisanal fishing boats from Myeik go to sea for just one day of fishing. Bottom-trawlers and purse seiners go farther offshore, spending about one month at sea. *Meekwet Zay* is the early morning fish market in Myeik where catches from the nearshore fishery are sold (Figure 5).

Thityarwa fishing village is situated on an island in the north of the Myeik

Archipelago. It is surrounded by mangrove forest. Small motorized ferry boats shuttle between Myeik and the village daily. Irrawaddy dolphins occur in waters adjacent to the village. Waterways are shallow and narrow at low tide due to sand flats at the entrance of Thitya creek. Thityawa fishing grounds are located in shallow nearshore waters (Figure 6). Kadan Kyun (Island) is situated in the north of the Myeik Archipelago and some fishermen go fishing there. Kyaukpya village is situated on the north bank of the Kyaukpya River



Figure 6. Fishermen at work on Thityawa fishing ground.

mouth and on the main road between Myeik and Dawei. In the near future some fishing ports are planned to be moved from Myeik to Kyaukpya.

2.2 Dawei

Dawei also has good air and land access. Some nearshore fishing boats come to Dawei but they need to wait until flood tide before coming to there (Figure 7). Passengers on high speed ferries must go to a port which is about 20 miles south of Dawei. The *Kanner Zay* (strand market) in Dawei is a major fish landing site, busy only in the morning with both wholesale and retail sales (Figure 8).

Maungmagan Beach is a popular resort located about 10 miles northwest of Dawei and one mile from Maungmagan village (Figure 9). Maungmagan village market is a busy fish market with traders from nearby villages and Dawei. There are plans to construct a sea port and hotel complex in Maungmagan.



Figure 10. Artisanal fishing boats at Thabausaik village.



Figure 7. Some artisanal fishing boats at Dawei *Kanna Zay* port.



Figure 8. Fish market place at *Kanna Zay* in Dawei.



Figure 9. Artisanal fishing boats at Maungmagan beach.

Thabausaik village is located about two miles south from Maungmagan and it is also a busy fish landing site (Figure 10). According to a fisherman from Thabausaik village, the village is a promising fish market as some leftover fish from other markets, even from Dawei, can be sold out

at there. Some fishing boats from other areas are also temporarily stationed at this village due to its easy access to Dawei. Some vessels spend only one day at sea but others go on trips lasting about two weeks.

Pantin Inn and Sakhanthit (Pitat) villages are located about one mile north of Maungmagan (Figure 11). They are also fishing villages and some of their catches are put on sale at the Maungmagan market. Fishermen from these villages also operate in the Ayeyawady Delta all the way northwest to Mawtinsun.



Figure 11. Artisanal fishing boats anchored at Sakhanthit village.

3 Definitions

The term fisheries bycatch is used extensively but sometimes it causes confusion. It is also called incidental catch. There are many definitions of bycatch but, according to Alerson *et al.* (1994), there are at least three different uses of the word.

- (1) Bycatch may refer to catch which is retained and sold but which is not the target species for the fishery.
- (2) Particularly in the Northeast and Western Pacific and in American legislation bycatch means species/sizes/sexes of fish which are discarded.
- (3) Bycatch is used to describe all non-target fish whether retained and sold or discarded (Hall, 1996).

One definition refers to species caught in a fishery intended to target another species, as well as reproductively immature juveniles of the target species ([en.wikipedia.org/wiki/ Bycatch](http://en.wikipedia.org/wiki/Bycatch), 2006).

Some phrases like “caught by accident ...”, “non-targeted sea life ...”, “incidentally caught with the targeted species ...”, “non-target organisms ...”, “unwanted fish ...”, “species unintentionally caught ...”, “all non-targeted catch ...”, “unwanted or unmarketable things ...”, “anything caught unintentionally” are also used in the definition of bycatch. It is clear that dolphins caught by accident are considered “bycatch”.

In some incidences, fishermen may encounter dolphins opportunistically during other fishing operations and, in favorable circumstances such as when dolphins are swimming close to their boats or stranded or entangled in their nets but found still alive, they may kill them opportunistically for sale in local markets. Fishermen from Maungmagan generally target fishes but they also bring along hand harpoons, locally called “*Zit*”, which are attached with buoys, to opportunistically kill dolphins and porpoises. In other cases, the fishermen may search for dolphins. The term “directed catch” used in this paper includes both the opportunistic and deliberate killing of cetaceans.

4 Methods

Field trips were made to the towns of Meik and Dawei and surrounding coastal villages during 19 October to 9 November 2005, and 27 February to 27 March 2006. Fish landing sites and local markets were monitored and fishing villages and grounds were visited. Offshore and nearshore fishermen, fish sellers and other local people were interviewed. Fish markets including the *Meekwet Zay* (early morning fish market) in Myeik, *Kanner Zay* (strand market) in Dawei, and the Maungmagan fish market were visited to monitor the landings and sale of cetacean carcasses and body parts. Fishermen were interviewed at these markets, landing sites, and onboard their vessels in Myeik, Thityawa, Kyaukpya, Dawei, Maungmagan, Sakhanthit and Thabausaik (Table 1, Figure 12 – 19).

Table (1). No. of interviews, markets, landing sites, and fishing grounds visited during the study.

	Myeik	Dawei
Interview	47	17
Markets	5	4
Landing site	6	4
Fishing ground	2	-



Figure 12. An interview with artisanal fishermen in Myeik.



Figure 13. An interview at the fishing vessels checkpoint in Myeik.



Figure 14. An interview at Myeik.



Figure 15. An interview at Thityawa village.



Figure 16. An interview on Thityawa fishing ground.



Figure 17. An interview on Kadan fishing ground.



Figure 18. An interview at Sakhanthit village.



Figure 19. An interview at Thabusaik village.

5 Results

5.1 Local names

5.1.1 Whale

Whales are called “*Wai La Nga*” in Myanmar language. But they are also called “*Nga Wun*”, “*Nga Wun Gyee*”, “*Wai La*”, or “*Wai La Nga*” along the coast near Myeik and Dawei.

5.1.2 Dolphins and porpoises

“*Labine*” is the common name of dolphins and porpoises in Myanmar. However, fishermen from Myeik call all dolphins and porpoises “*Lann Shuu*”. But, fishermen from Dawei call cetaceans without a beak “*Lann Shuu*” and those with a beak “*Lann Phaí*”. In this report, “dolphin” refers to both “*Lann Shuu*” and “*Lann Phaí*” (i.e. dolphins and porpoises) but “porpoise” is used specifically for the finless porpoise.

5.2 Reported sightings

5.2.1 Whales

Whale sightings were reported by offshore fishermen and some artisanal fishermen who go far out to sea. According to these fishermen, at first a whale looked like a rock and then they realized it was moving. Some fishermen saw blows and others reported whales feeding on small shrimps with an open mouth. Some said that whales could be sighted most frequently at the beginning of the rainy season.

Of the 23 artisanal fishermen interviewed in Myeik, only two had sighted whales, both while working on offshore bottom-trawlers. A fisherman from Thityawa village said that about eight months ago he saw an injured whale which

was helped by two small whales near Kyun Me Gye Island and Lagyan Aw of Kyunn Tann Shey (Lampi) Island. Because it was a strange view, the skipper called the rest of his crew to watch the event but they had no idea about the cause of injury. The fisherman said that the injured whale had a blunt head and was bleeding. The injured whale and two helpers surfaced alternately and they were swimming towards the open sea. The fisherman estimated that big one was almost six times bigger than the two helpers which were almost the same size and black.

Fourteen out of 19 offshore bottom trawler skippers interviewed (i.e. 74%) had sighted whales (Figure 20). One skipper reported sighting whales about 10 times during his eight years of experience at sea. He said that in 2004 a group of whales was sighted near Kunn Thee Island. He described them as mostly black except for a portion under the lower jaws which was white, and that they lived in a group of four animals. He said that they looked like dolphins but conspicuously bigger and indicated that they were killer whales *Orcinus Orca* after being shown illustrations of the world's cetaceans. He also sighted the same type of whales in 1996. A total of 11 artisanal fishermen were interviewed in Dawei. Only three had sighted whales.

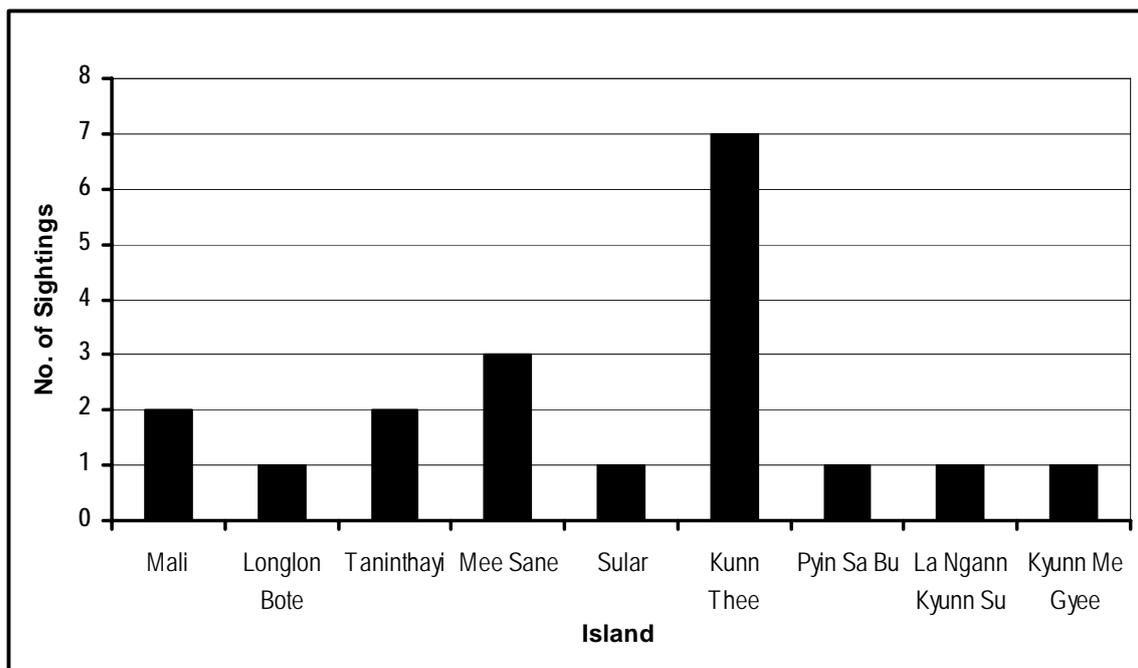


Figure 20. Number of whale sightings reported by fishermen with reference to nearby islands.

5.2.2 Dolphins and porpoises

Dolphins were sighted by all fishermen from Myeik and Dawei. Some fishermen from Thityawa and Myeik said that dolphins were sighted mostly during neap tide. Fishermen said that dolphins were abundant and could be found almost everywhere at sea especially during fine weather. A bottom-trawler skipper said that he saw dolphins in groups of up to 100. Dolphins were reported to sometimes come into the Kyaukpya River and Thityawa Creek. Dolphins without beaks were sighted mostly by nearshore artisanal fishermen. The author sighted a group of 6-7 Irrawaddy dolphins, including a calf, at the mouth of Thityawa Creek on 29 October 2005 (Figure 21).



Figure 21. Irrawaddy dolphins sighted near the Thityawa creek mouth.

5.3 Reported strandings

5.3.1 Whales

Fishermen reported that whales had stranded at Sakhanthit, Maungmagan and Hmyawyt villages near Dawei, and at Pannataung (near Thityawa village) and at Kyunn Tann Shey (Lampi Island) near Myeik. A midwife from Thityawa village showed the author photographs taken of a stranded whale during her visit to observe the whale at Pannataung in 2001 (Figure 22).



Figure 22. A whale stranded at Pannataung beach near Thityawa village.

A rotten whale (c. 37 feet or 11 meters in length) stranded near Hmyawyt village (near Thabausaik) in June 2005 and its bones were collected and displayed by the Department of Zoology, University of Dawei. A whale (c. 57 feet

or 17 meters in length) was reported stranded near Sakhanthit village in October 2005.

5.3.2 Dolphins and porpoises

Dolphin strandings were reported from Thityawa village and Myeik. Dolphins sometimes came into the shallow water and became trapped on the sand/mud flats when the tide receded. Dolphin strandings were also reported in the mouth of the Dawei River, Maungmagan Bay and near Sakhanthit (Pitat) village.

5.4 Reported bycatch

5.4.1 Myeik

Based on interviews with fishermen, cetaceans could become entangled with long lines and purse seine nets, beach seine nets, and gill nets. Most accidental killings happened during nearshore fishing. Bottom-trawler skippers explained that dolphins did not become entangled in their nets as they were dragged on the bottom. Several fishermen from Myeik and Dawei remarked that dolphin entanglements were likely to happen with “*Paik Kyee Hlay*” (net-fishing boats) and “*Wa Dan*” (purse seines).

Except for one case in 2004, no whale bycatch was reported. A fisherman from Myeik said that a whale was accidentally entangled in a purse seine net near West Sular Island. Crews released the animals by using a winch and cutting the rigging but they were not sure whether it remained alive or not. A skipper of a bottom-trawler said that a badly rotten whale was included in his catch near Kunn Thee Island about six years ago.

Dolphin entanglements with gill nets in 2000 and 2003 were reported by fishermen from Thityawa. They said that dolphins normally became entangled by their flukes in the head rope of the net. Some fishermen from Myeik said that cetacean entanglements happened more often in the rainy season because some

net-fishermen changed from gill netting to squid fishing during the dry season. One fisherman said that twice he accidentally caught dolphins while long line fishing in 2004 near Sakhanthit south of Myeik. A fisherman from Kyaukpya village reported a dolphin becoming entangled in his gill net set near Kadan Island. A fisherman from the same village said that three dolphins were accidentally caught in his gill net during one haul about nine years ago.

5.4.2 Dawei

Accidental killing of cetaceans in fishing nets was also reported from waters near Dawei. Some dolphins were accidentally encircled with beach seines. Fishermen from Sakhinthit said that dolphins came close to the shore to find refuge during strong east winds. A fisherman from Sakhanthit said that he caught about 20 dolphins while hauling a beach seine net in 2000. However, he said that dolphins had not caught in his net during the last few years. A fisherman from Thabusaik said that two dolphins were accidentally caught in his gill net about nine and ten years ago each. Two dolphins were also reported entangled with the seine nets nearshore of the Longlon coast. Marks observed on two spinner dolphins *Stenella longirostris* for sale at the Maungmagan market indicated that they had become entangled in fishing nets (Figure 23).



Figure 23. A clear net-mark on the head of a dolphin.

5.5 Directed Catch

5.5.1 Myeik

A fisherman from Myeik said that a dolphin was killed opportunistically after being caught in a gill net during October 2005. No directed fishery for small cetaceans was reported by fishermen from Myeik.

5.5.2 Dawei

Directed killing of dolphins has been practiced in waters near Maungmagan for many years. According to interviews with fishermen some fishing boats carry hand harpoons, locally called “Zit”, attached by a rope to plastic buoys. These boats will search for dolphins if they do not find them during normal fishing operations.



Figure 25. A puncture wound observed on the back of a spinner dolphin.



Figure 24. A dolphin with piercing wounds was put on sale at Maungmagan market.

The fishermen said the dolphins die within a few minutes after being harpooned and are easily pulled in by the attached rope. Large puncture wounds observed on a spinner and two Indo-Pacific bottlenose dolphins at the Maungmagan market indicated that they were killed by a hand harpoon or other pointed tools (Figure 24 & 25).

5.6 Landings and Sales

5.6.1 Myeik

Landings of cetaceans were not reported by the skippers of offshore fishing vessels. There are many fish landing sites in Myeik but *Mee Kwet Zay* (an early morning fish market) is a popular market where nearshore artisanal fishermen sell their catch. Some fish sellers at *Mee Kwet Zay* estimated that about two to three dolphins were sold per month at this market. In October 2005 they reported selling a dolphin as a whole animal for 35,000 kyats (c. 35 USD). No dried dolphin meat was observed in Myeik and dried fish sellers said they did not sell dried dolphin meat.

5.6.2 Dawei

Landings of cetaceans were reported from Dawei and nearby villages. Dolphins came to Dawei directly from nearshore fishing boats and were sold at “*Kanna Zay*” (strand market) as whole carcasses. No fresh chopped dolphin meat was found with fish retailers at the strand market but it was reported that a dolphin carcass was sold there in February 2005.



Figure 26. A dolphin on sale at Maungmagan market.

Dried fish sellers at Dawei bazaar and “*Kanna Zay*” said that they usually do not sell dried dolphin meat but, sometimes, it arrives from other villages and they can order the meat if requested. Fresh, dried and salted dolphin meat, flippers, flukes and internal organs were available at the Maungmagan fish market (Figure 26 – 35). Dried and salted dolphin meat, skin, fins and internal organs were found every day at the Maungmagan market, which is the main distribution point for these products to nearby villages and Dawei. Fresh dolphin meat arrives either as whole carcasses or already chopped. The meat was reported to come from local waters near Maungmagan, Thabausaik and Pantin Inn. Some retailers from Maungmagan bought dolphin carcasses and then resold the pieces at the same market or the *Myo Houn* (Old Dawei) market. Some fish sellers from other areas also bought dried and salted dolphin meat at the Maungmagan market.



Figure 27. Chopping a dolphin at Maungmagan market.



Figure 28. Fresh dolphin meats on sale at Maungmagan market.



Figure 29. Dried dolphin meat on sale at Maungmagan market.



Figure 32. Dried dolphin ribs and parts.



Figure 34. Salted dolphin parts on sale at Maungmagan market.



Figure 30. Fresh dolphin meat.



Figure 31. Dried dolphin meat.



Figure 33. Dried dolphin skin, fins and flukes.



Figure 35. Salted dolphin skin, fins and flukes.

Table (2). Cetaceans on sale at Myeik, Dawei and Maungmagan.

Sr. No.	Date	Location	Species	No. of Dolphin	Whole / Chopped	Remarks
1	-/10/05	Myeik, <i>Meekwet zay</i>	unidentified	1	Whole	Reported by fish sellers
2	30/10/05	Myeik, <i>Meekwet zay</i>	unidentified	1	Whole	Reported by fish sellers
3	-/2/06	Dawei, <i>Kanna zay</i>	unidentified	1	Whole	Reported by fish sellers
4	-/3/06	Maungmagan market	ID	1	Whole	Reported by fish sellers
5	7/3/06	Dawei, <i>Kanna zay</i>	unidentified	1	Whole	Reported by fish sellers
6	7/3/06	Maungmagan market	IHD	1	Whole	Observed
7	9/3/06	Maungmagan market	IBD	7	Chopped	Observed
8	11/3/06	Maungmagan market	IBD	1	Chopped	Observed
9	12/3/06	Maungmagan market	SPD	2		Observed
10	13/3/06	Maungmagan market	SPD	1	Whole	Observed
11	15/3/06	Maungmagan market	IBD	2		Observed
12	16/3/06	Maungmagan market	IBD	1	Whole	Observed
13	17/3/06	Maungmagan market	IBD	2	Chopped	Observed
14	19/3/06	Maungmagan market	IBD	2	Whole	Reported by fish sellers
15	21/3/06	Maungmagan market	IBD ID	2 1	Whole Whole	Reported by fish sellers Reported by fish sellers
16	22/3/06	Maungmagan market	ID	1	Whole	Reported by fish sellers
17	2/4/06	Maungmagan market	IBD FP	1 1	Whole Whole	Reported by Nang Mya Han

IBD = Indo-Pacific bottlenose dolphin
 IHD = Indo-Pacific humpback dolphin
 SPD = spinner dolphin

ID = Irrawaddy dolphin
 FP = finless porpoise

Seven Indo-Pacific bottlenose dolphins were sold on 9 March 2006 at the Maungmagan market (Figure 36). According to some fish sellers at this market, about 30 cetaceans per month of various species are available for sale during all seasons. Landings vary depending on the number of boats arriving from fishing grounds to Thabausaik, Pantin Inn and Maungmagan villages. It was reported that landings of dolphin carcasses, dried body parts and sometime live dolphins occurred at Thabausaik.



Figure 36. Fresh dolphin meat on sale at Maungmagan market.



Figure 37. Some dolphin meat buyers at Maungmagan.

5.7 Consumption

Most local people abstain from eating big fish and dolphin meat, although some people living in suburban areas do consume small cetaceans. The demand for dolphin meat at the Maungmagan market is high (Figure 37 & 38). According to some consumers, fresh dolphin meat is palatable although a little oily. Dried fins, flukes or skin need to be boiled tender before being eaten.



Figure 38. Dolphins on sale and some buyers at Maungmagan.

5.8 Species

Whales could not be identified from the fishermen's descriptions. Indo-Pacific bottlenose dolphins *Tursiops aduncus*, Indo-Pacific humpback dolphins *Sousa chinensis*, and spinner dolphins *Stenella longirostris*, were identified during visits to Maungmagan market. Irrawaddy dolphins *Orcaella brevirostris* were reported caught by local fishermen. Finless porpoise was observed by Nang Mya Han, a Professor of Marine Science at Myeik University, during her field trip to Dawei and reported to the author.

5.9 Fishing Gears

About 300 fishing boats of various sizes use Thabausaik as their landing site (Figure 39 & 40). Thabausaik village is situated in Longlon township. Fishing gears registered at Longlon township fisheries office are described in Figure 41 and Table 3. Many types of passive and active fishing gears are used for nearshore and offshore fishing in the Tanintharyi coastal waters (Figure 42).

Table 3. Motorized and non-motorized inshore fishing gears registered at Longlon Department of Fisheries.

Year	Motorized Vessels	Non-motorized Vessels	Total
2003-04	597	277	874
2004-05	667	222	889
2005-06	741	165	906



Figure 39. Some artisanal fishing boats at Thabausaik village.



Figure 40. Some artisanal fishing boats at Thabausaik village.

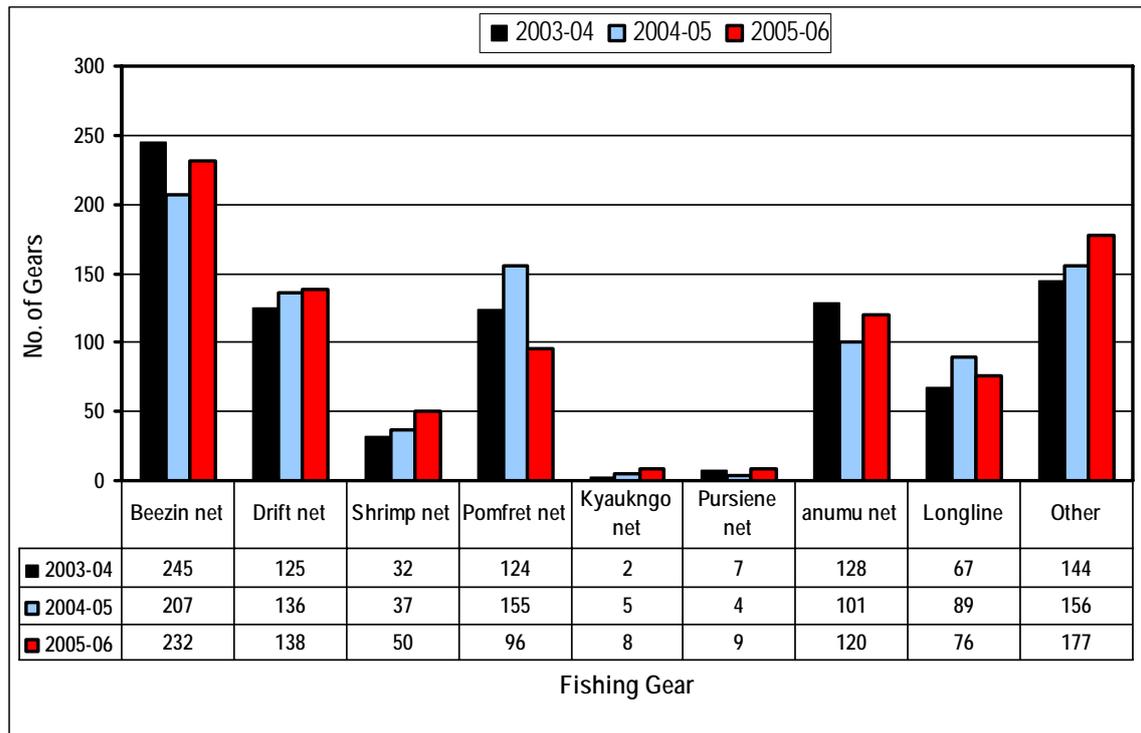


Figure 41. Near shore fishing gears registered at Longlon Department of Fisheries in 2003-2006.

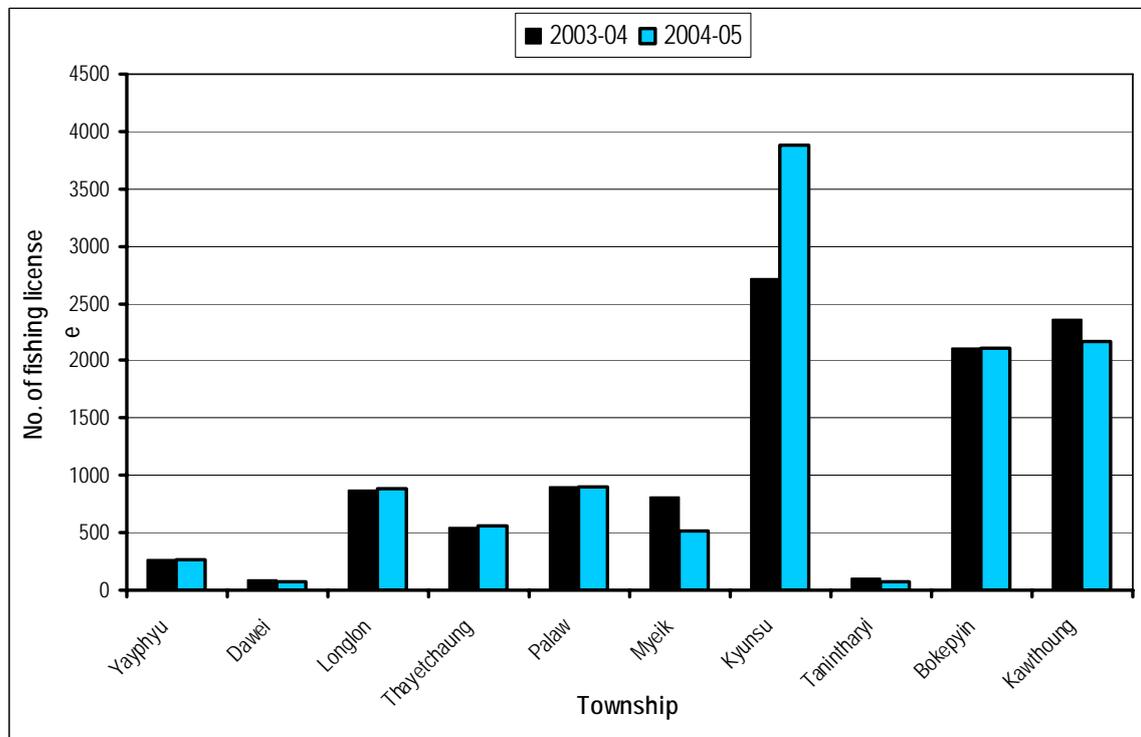


Figure 42. Township-wise no. of fishing licenses registered in 2003 – 05 in Tanintharyi Division.

5.10 Traditional beliefs and attitudes

Fishermen believe that seeing a whale at sea is a warning sign of their wrong way of action, speech, mind or body to which the celestials concerned with the sea do not like. They throw water and rice into the sea when they see a whale to excuse their wrong way of action. Therefore, some fishermen do not want to encounter a whale at sea because they believe that it is a warning sign. Fishermen said that a whale looked like a massive rock and they were afraid

when it surfaced near their boats because they thought it could endanger them.



Figure 43. U Shin Gyee shrine with some whale jaws offerings at a Dry Dock in Myeik.

Some whale jaws found together with offerings are located near the "U Shin Gyee" shrine at a dry dock in Myeik (Figure 43). "Oo Shin Gyee" is a "Nat", or a celestial, who is the guardian spirit of marine waters. Delta and seagoing

vessels are in his charge. Therefore, offerings are made to him whenever a boat is launched. Some fishermen use whale jaws as ornaments on their boat (Figure 44).

Fishermen and local people regard dolphins as life guards and believe they will save humans in trouble at sea. A fisherman at Dawei said that dolphins were "Nat nga" or celestial fish because they were created by celestials. He also said that celestials created dolphins with flukes in a transverse position to distinguish them from other fish. Some fishermen said that they would save the life of an entangled dolphin if the animal was found still alive.



Figure 44. A whale jaw ornamented on top of the wheel house of a trawler.

Dolphins reportedly scared some nearshore fishermen with their respirations and splashes when they swam in a big group near their fishing boat at night. Some fishermen from Thabauseik and Dawei said they sometimes banged two iron bars together in the water to scare the dolphin from stealing their fish and interfering with their operations.

6 Discussion

Cetacean bycatch is a serious problem for marine mammal populations and mitigation measures have been sought. A global bycatch initiative was launched in early 2002 by World Wildlife Fund-US and their strategy calls on governmental and non-governmental bodies to move quickly, cooperatively, and thoughtfully to achieve bycatch reduction (Reeves *et al.* 2004).

In Sri Lanka small cetaceans continue to be killed both directly using hand harpoons and indirectly through entrapment in gill nets. Small cetaceans are sold to consumers at inland markets away from the coast under the false pretext of being dugong flesh (Ilangakoon, 2002).

Deliberate and accidental catches of cetaceans appear to be particularly common in Dawei. Indo-Pacific bottlenose dolphins and spinner dolphins were the most frequent species observed at the Maungmagan market. Cetacean catches (including bycatch and directed catch) are estimated to be at least a few hundreds in waters near Dawei and at least in the low tens in waters near Myeik.

Except for some apparent marks, such as the thread-like pattern on the neck made by a net, or single or multiple piercing wounds made by hand harpoons, it was difficult to determine the cause of death for most carcasses observed at fish markets. In other areas of the world, cetacean bycatch occurs in almost all major gear types, including drift nets/gill nets, bottom trawls, pots, long lines, tangle/trammel nets, fish traps, purse seine and other sound nets, pelagic trawls, set nets, etc. (Northridge 1991; National Research Council 1992). Though

cetacean bycatch was not reported from bottom trawlers from Myeik, they are the most numerous offshore fishing vessels in the Taninthayi Division. Their landings should be taken into account for monitoring cetacean bycatch. Some fishermen from Kyaikkhami Town in the Mon State are also reported to practice killing of dolphins with hand harpoons.

Generally, people in Myanmar abstain from eating the meat of big fishes and animals. Consumption of whale, dolphin and porpoise meat appears to be localized and almost all demand and supplies are at village or suburban levels. There are plans to upgrade Maungmagan as a port and resort. Dolphin meat could become a local favorite at the resort unless measures are taken to eliminate the sale of these products.

Most local people do not know that Irrawaddy dolphins and dugongs are protected by law. They do not know even which is the Irrawaddy dolphin and, therefore, information given during this study may improve their knowledge. The participation of local people is a vital component for mitigating cetacean bycatch.

Indo-Pacific bottlenose and spinner dolphins were the most common species observed being sold at the Maungmagan fish market. Cetacean species with high bycatch rates in other areas of the Indian Ocean include spinner dolphins off Sri Lanka, common dolphins (*Delphinus delphis*) in the Southwest Indian Ocean Basin and Tasman Sea, and pan-tropical spotted dolphins (*Stenella attenuata*) in the North Indian Ocean (Alverson, *et al.* 1994).

According to a Department of Fisheries officer, many hundreds of dolphins were previously observed in waters nearby Maungmagan. This information is supported by reports of fishermen from Sakhinthit village who stated that they could previously catch as many as 20 dolphins in a single fishing trip. However, the absence of dolphin bycatch in Sakhinthit during the last few years may indicate a decline in the numbers of dolphins and porpoises in the area.

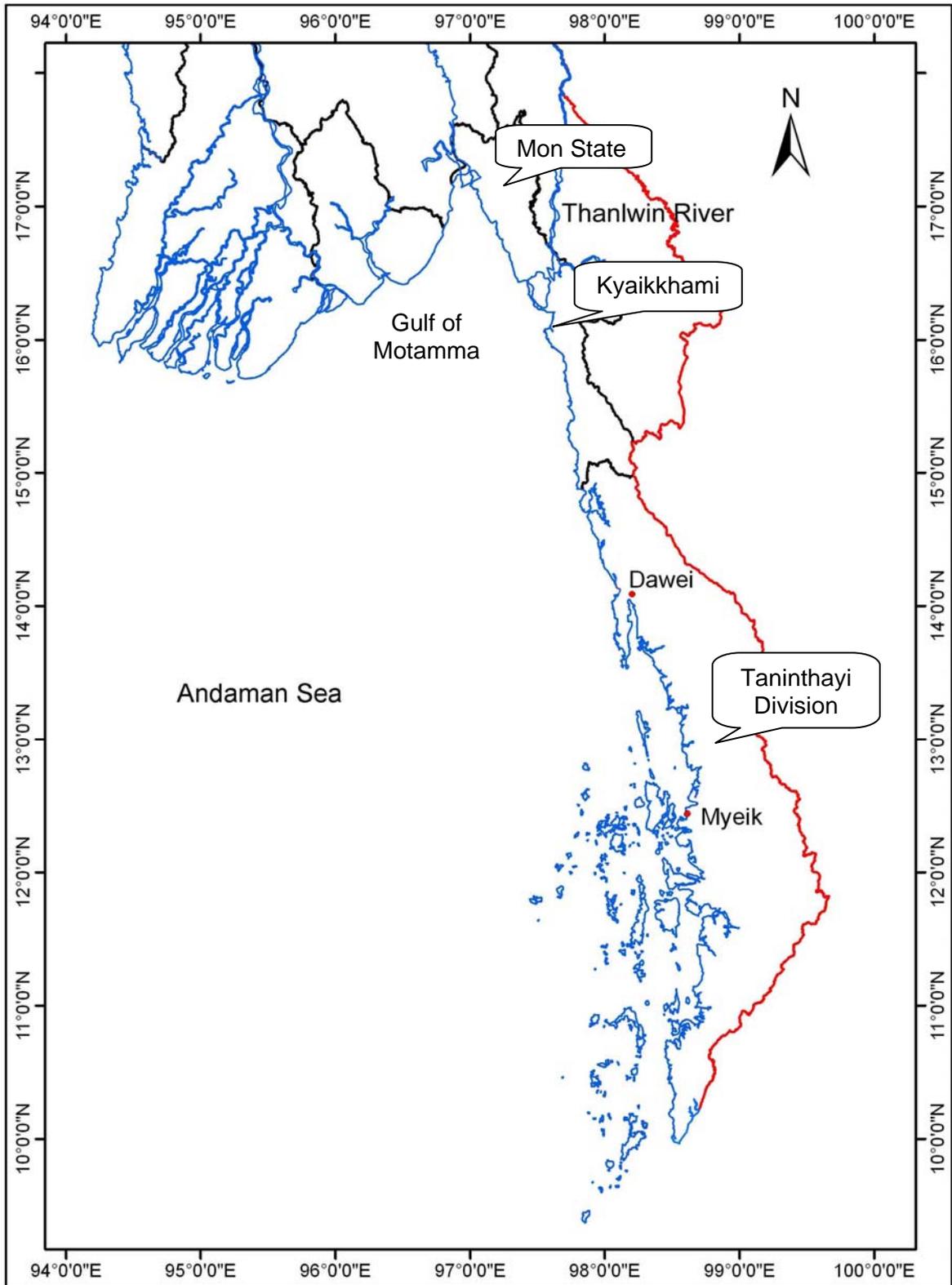


Figure 45. Map showing the Myeik, Dawei, Kyaikkhami and Thanlwin River.

7 Conclusions and recommendation

Provisional conclusions and recommendations based on the two assessment trips are that:

(a) Seine nets and gill nets represent the main threats to small cetaceans in the waters near Myeik and Dawei, with directed catches from hand harpoons presenting an additional threat that applies mostly to Dawei.

(b) Exploitation of dolphins for consumption by local people is common but apparently localized to Maungmagan and nearby villages.

(c) Mortality from dolphin catches (including bycatch and direct catch) probably numbers in the low hundreds per year in the waters near Maungmagan and in the low tens per year in the waters near Myeik.

(d) Public education and conservation awareness about cetaceans is urgently needed in the coastal area of Dawei district.

(e) A cetacean survey should be carried out between the Thanlwin River Mouth and Myeik in the Mon and Taninthayi Divisions of Myanmar (Figure 44).

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