

Cetaceans and mass strandings in Thai waters

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ABSTRACT

A total of 25 species of cetaceans have been recorded in Thai waters from stranding and sighting records. A summary of these, together with details of five mass strandings on the Andaman Sea coast of Thailand, are reported here. The first mass stranding, of nine spinner dolphins (*Stenella longirostris*) was at Talibong Island, Trang Province, in January 1999; six carcasses were examined and three were lost. The second record comprised five spotted dolphins (*Stenella attenuata*) stranded at Ban Ko Kho Khao, Phang-nga, in February 1999; two dolphins were released alive. The third stranding was of eight spotted dolphins at Mai Phai Island, Phang-nga, in March 2006; five animals died and three were released alive. The fourth mass stranding was of 30 false killer whales (*Pseudorca crassidens*) at Racha Yai Island, Phuket, in June 2008; 29 animals were released while one drowned. The fifth record consisted of three rough-toothed dolphins (*Steno bredanensis*) stranded at Nam Bor Bay, Phuket, in July 2008; all three were returned to the open sea. It was difficult to determine the causes of death of the stranded dolphins. However, it was possible that the first two mass strandings were caused by disease. Some strandings were possibly influenced by the landscape of the stranding locations (narrow bay in one case, wide gently sloping beach in another).

KEYWORDS: IRRAWADDY DOLPHIN; INDO-PACIFIC BOTTLENOSE DOLPHIN; FINLESS PORPOISE; FALSE KILLER WHALE; STRIPED DOLPHIN; SPINNER DOLPHIN; PAN TROPICAL SPOTTED DOLPHIN; INDO-PACIFIC HUMPBACK DOLPHIN; SPERM WHALE; MASS STRANDING; ANDAMAN SEA; GULF OF THAILAND

INTRODUCTION

Strandings, particularly mass strandings, of marine mammals attract a great deal of public attention. In recent years, the public has generally supported the laboratory investigation of dead animals in order to further scientific knowledge, as well as the return of live animals to the sea (Harwood, 2002; St. Aubin *et al.*, 1996).

Thailand has conducted regular cetacean research since 1993, mostly undertaken by the Phuket Marine Biological Center (PMBC) under the Department of Marine and Coastal Resources (DMCR). Its cetacean research programme was initiated through a collaboration with Danish scientists under the Small Cetaceans in the Gulf of Thailand and the Andaman Sea Project (Chantrapornsyl *et al.*, 1996; 1999; 1991). Information on species distribution and abundance, including biology and behaviour of cetaceans was obtained from interviews, stranding records and surveys under this programme. A stranding network for marine endangered animals (cetaceans, dugong and sea turtles) was set up and has been operated in cooperation with villagers, non-government and government organisations in coastal provinces. This network has worked well, and as a result most data currently available on cetaceans in Thailand were obtained from stranded animals.

Nevertheless, some information is available from other sources. Boat and aerial surveys have been conducted to investigate species distribution, abundance and behaviour (Adulyanukosol and Kittiwattanawong, 2004; Adulyanukosol *et al.*, 2000; Chantrapornsyl, 1996; Chantrapornsyl *et al.*, 1996; 1999; Intongcome *et al.*, 2005a; 2005b; Mahakunlayanakul and Surada, 1999; Ninwat *et al.*, 2008; Thongsukdee and Swangarreraks, 2005; Yamada *et al.*, 2000; 2006).

This report provides updated information on species diversity and distribution of cetaceans in Thailand and on mass stranding events, including details of attempts to rescue live-stranded animals. Other aspects of cetacean biology are not considered here.

MATERIAL AND METHODS

The information on species diversity and distribution of cetaceans in Thailand in this study was compiled from the database of PMBC (1993 to 30 June 2009), together with earlier publications: Anderson and Kinze (1999); Adulyanukosol (1999); Adulyanukosol *et al.* (2009; 2000); Chantrapornsyl *et al.* (1996; 1999; 1991); Intongcome *et al.* (2005a; 2005b); Ninwat *et al.*, (2008); Sirimontraporn and Sritakorn (1995); Thongsukdee and Swangarreraks (2005); Yamada *et al.* (2000; 2006). The PMBC database includes information from reports of stranded cetaceans as well as details of many specimens which were transferred to PMBC or to other DMCR centres for species identification and necropsy. During necropsy, tissue samples were collected for studies including genetics, parasitology, histology and investigations of both heavy metal and organochlorine pollutants (Harino *et al.*, 2007; 2008). Skeletal material was retained for species identification and osteological examination. With large whales or badly decomposed specimens, the carcasses were examined on-site and buried afterwards.

RESULTS AND DISCUSSION

Species and distribution

Stranding records

Eighteen species of cetaceans were recorded in Thailand up to 1993 (Anderson and Kinze, 1999). Subsequently, an

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additional five species were reported by Chantrapornsyl *et al.* (1999) and Adulyanukosol and Kittiwattanawong (2004). More recently, Yamada *et al.* (2006) studied Thai specimens of balaenopterids, including morphological investigations of skulls and skeletons, and molecular analysis. Prior to that work, all balaenopterid specimens (except one record of fin whale) were identified as Bryde's whale *Balaenoptera edeni*. However, Yamada *et al.* (2006) demonstrated that some of those specimens were in fact Omura's whale *Balaenoptera omurai*. These recent studies brought the total number of cetaceans found in Thai waters to 25 species, belonging to six families: Balaenopteridae (4 species), Physeteridae (1), Kogiidae (2), Ziphiidae (2), Delphinidae (15) and Phocoenidae (1). Twenty-three of these species have been recorded in the Andaman Sea and 18 in the Gulf of Thailand (Table 1 and Fig. 1).

There were a total of 553 stranding records in the PMBC database as of 30 June 2009. Strandings of offshore species and mass strandings occurred only along the Andaman Sea coast, not on the coast of the shallow Gulf of Thailand. Species/groups with more than 10 individuals stranded were: balaenopterids (104), Irrawaddy dolphin *Orcaella brevirostris* (98), Indo-Pacific bottlenose dolphin *Tursiops aduncus* (63), finless porpoise *Neophocaena phocaenoides* (58), false killer whale *Pseudorca crassidens* (45), striped dolphin *Stenella coeruleoalba* (40), spinner dolphin *S. longirostris* (34), pantropical spotted dolphin *S. attenuata* (30), Indo-Pacific humpback dolphin *Sousa chinensis* (25) and sperm whale *Physeter macrocephalus* (13) (Table 1). Among these records, 161 specimens from 20 species were deposited in PMBC. The stored samples of species/group with more than 10 specimens were striped dolphin (28), Indo-Pacific bottlenose dolphin (20), pantropical spotted dolphin (19), spinner dolphin (18), finless porpoise (13), the group of Bryde's and Omura's whales (12), and Irrawaddy dolphin (11) (Table 1).

Sighting records

Cetacean sightings surveys (boat and aerial) have been concentrated in a few areas: the upper Gulf of Thailand (Phetchaburi, Samut Songkhram, Samut Sakhon, Bangkok, Samut Prakan, Chachoengsao and Chonburi Provinces); Trat Province; Chaiya Bay in Surat Thani Province; Khanom Bay in Nakhon Si Thammarat Province; Songkla Lake in Phatthalung Province; Sriboya, Cham and Pu Islands in Krabi Province; Tase village in Trang Province; and Salai Islands in Satun Province. Among the total of 25 species recorded from Thailand, only 13 species were observed during these surveys (Table 2).

Mass strandings

There were five records of mass strandings in the Andaman Sea: one case in Trang Province, two cases in Phang-nga Province and two cases in Phuket Province (Table 3, Fig. 3).

The first stranding, of nine spinner dolphins (necropsy code End 128–136), was at Talibong Island, Trang Province (99°21.7'E, 7°13.9'N), on 25 January 1999. Among the nine carcasses, six were examined and three were lost (Table 3 and Fig. 2). The six carcasses examined were all male, with body lengths of 1.77–1.90m and weights of 37 to 48kg.

Table 1

Species of cetacean recorded in Thai waters, by region. Adapted from Chantrapornsyl *et al.* (1999), Adulyanukosol *et al.* (2004; 2009), Yamada *et al.* (2006) and the PMBC database from 1993 to mid-2009. AS = Andaman Sea, GT = Gulf of Thailand, N1 = Number of stranding records, N2 = Number of skeletons at PMBC, * = sighting record.

Common name	Scientific name	AS	GT	N1	N2
Balaenopteridae					
Fin whale	<i>Balaenoptera physalus</i>	–	•	1	–
Bryde's whale	<i>Balaenoptera edeni</i>	•	•	} 104	12
Omura's whale	<i>Balaenoptera omurai</i>	•	•		
Humpback whale	<i>Megaptera novaeangliae</i> *	•	–	–	–
Physeteridae					
Sperm whale	<i>Physeter macrocephalus</i>	•	–	13	5
Kogiidae					
Pygmy sperm whale	<i>Kogia breviceps</i>	•	•	8	2
Dwarf sperm whale	<i>Kogia sima</i>	•	–	6	6
Ziphiidae					
Ginkgo-toothed whale	<i>Mesoplodon ginkgodens</i>	•	–	1	–
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	•	–	1	1
Delphinidae					
Killer whale	<i>Orcinus orca</i>	•	•	1	–
False killer whale	<i>Pseudorca crassidens</i>	•	•	45	6
Pygmy killer whale	<i>Feresa attenuata</i>	•	•	4	2
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	•	•	2	1
Melon-headed whale	<i>Peponocephala electra</i>	–	•	2	–
Indo-Pacific humpback dolphin	<i>Sousa chinensis</i>	•	•	25	7
Indo-Pacific bottlenose dolphin	<i>Tursiops aduncus</i>	•	•	63	20
Rough-toothed dolphin	<i>Steno bredanensis</i>	•	•	8	2
Long-beaked common dolphin	<i>Delphinus capensis</i>	•	•	3	3
Spinner dolphin	<i>Stenella longirostris</i>	•	•	34	18
Striped dolphin	<i>Stenella coeruleoalba</i>	•	•	40	28
Spotted dolphin	<i>Stenella attenuata</i>	•	•	30	19
Fraser's dolphin	<i>Lagenodelphis hosei</i>	•	–	4	3
Irrawaddy dolphin	<i>Orcaella brevirostris</i>	•	•	98	11
Risso's dolphin	<i>Grampus griseus</i>	•	–	2	2
Phocoenidae					
Finless porpoise	<i>Neophocaena phocaenoides</i>	•	•	58	13
Total		23	18	553	161

Parasites were found in the stomachs while cysts were found around the genital areas in all specimens. The stomachs of all specimens were empty.

The second stranding consisted of five spotted dolphins (End 137–139) at Ban Ko Kho Khao, Phang-nga Province (98°15.1'E, 8°53.9'N), on 3 February 1999. Two dolphins were released soon after stranding and three dolphins died. The three carcasses were transferred to PMBC for necropsy. All three carcasses were male, with body lengths of 1.9–2.2m and weights of 57.5 to 81kg (Table 3). Their stomachs were empty, thus it is likely that the dolphins had been ill for some period of time before stranding (see below). However, their tissues have yet to be examined to determine the cause of stranding/death.

The third stranding consisted of eight spotted dolphins (End 403–407) at Mai Phai Island, Phang-nga Province (98°32.5'E, 8°20.0'N) on 24 March 2006. Five dolphins died while three were released. The five dead dolphins comprised three males and two females. Their body lengths ranged from 1.87–2.14m and they weighed 47.5 to 75kg (Table 3 and Fig. 2). Three of the dead dolphins appeared to be healthy. One was assumed to have died from drowning as some water was

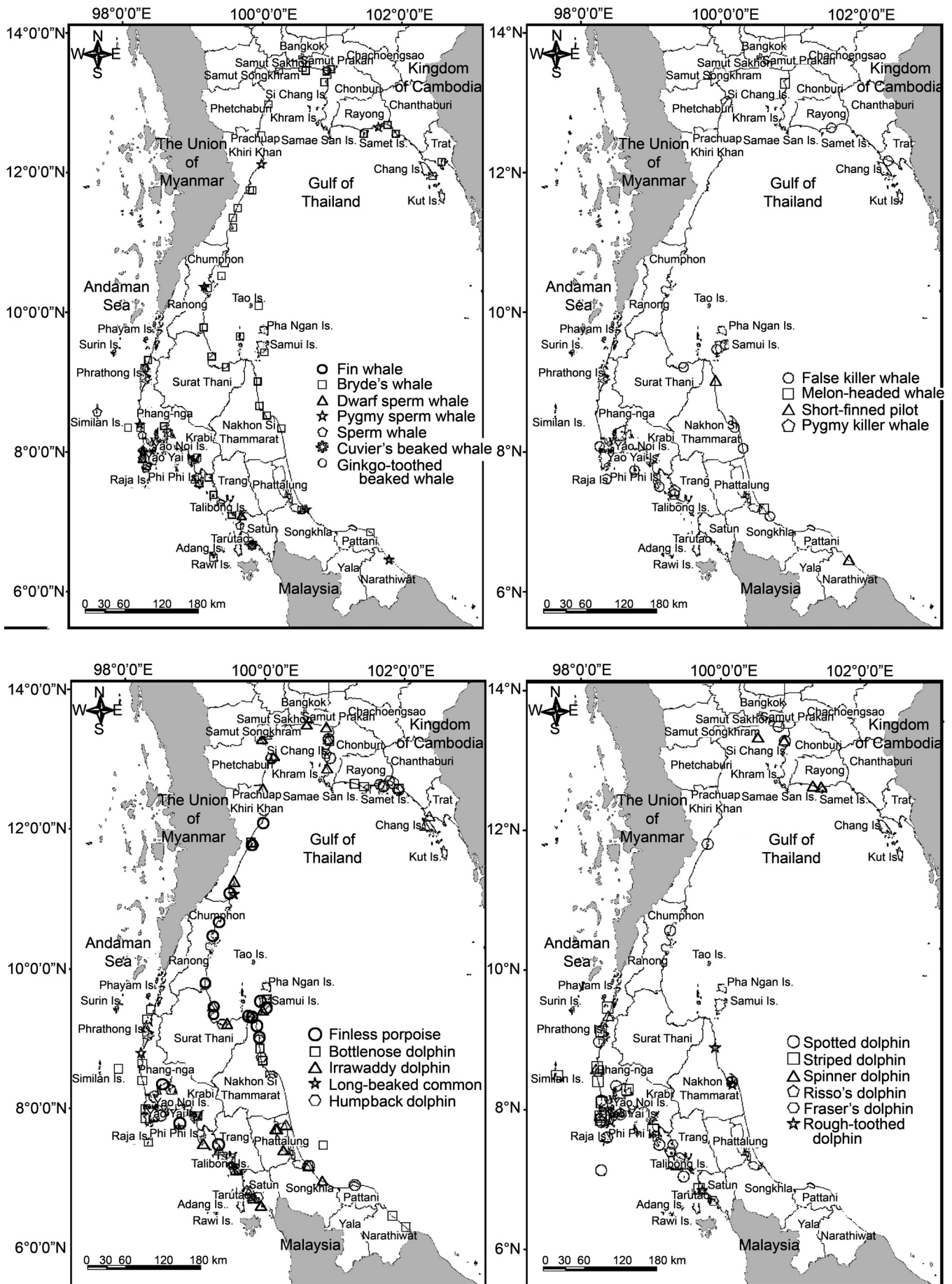


Fig. 1. Locations of cetacean strandings in Thai waters.

Table 2

Summary of records of 13 cetacean species sighted during boat and aerial surveys, including opportunistic sightings. Information collected from 1993 to mid-2009 based on Adulyanukosol *et al.* (2000; 2009); Intongcome *et al.* (2005b); Kiatkarnjanakul (1994); Ninwat *et al.* (2008); Thongsukdee and Swangrerraks (2005); database of PMBC; E. Hines (pers. comm.); A. Intongcome (pers. comm.); S. Man-anansap (pers. comm.); S. Ninwat (pers. comm.); S. Pratip Na Talang (pers. comm.); S. Thongsukdee (pers. comm.); S. Yossundara (pers. comm.)

Species	Location (province)	
	Andaman Sea	Gulf of Thailand
Bryde's whale	N of Phang-nga (2 ind.); Racha Is., Phuket (3–4 ind.); Satun (2 ind.)	Chonburi (4 ind.); Petchaburi (about 5 ind.); Prachuap Khiri Khan (1–3 ind.); Surat Thani (1 ind.); Nakhon Si Thammarat (1 ind.); Songkhla (1 ind.)
Omura's whale	Phuket (4 ind. between Racha Is. and Similan Is.)	–
Humpback whale	E of Phuket Is. (1 ind.)	–
Short-finned pilot whale	W of Phuket Is. (a pod of about 10 ind.)	–
Killer whale	Phuket and Phang-nga (8 times, pod size about 2–30 ind.)	Surat Thani (2 ind. at once)
False killer whale	Similan Is., Phang-nga (A large group of about 50 ind.)	–
Indo-Pacific humpback dolphin	N of Phang-nga (5 ind.); around Sriboya Is. and Krabi Bay, Krabi (5 ind.); Tase village, Trang (30–40 ind.); around Saria Islands, Satun (10 ind.)	Rayong to Trat (15 ind.); Samut Songkhram (5 ind.); Prachuap Khiri Khan to Surat Thani (65 ind.); Khanom Bay, Nakhon Si Thammarat (35 ind.); Sonkhla to Pattani (10 ind.)
Indo-Pacific bottlenose dolphin	N of Phang-nga (10 ind.); Yao Is., Phang-nga Bay (20 ind.); Khai Nok Is., Mai Thon Is-Hae Is, Phuket (20 ind.)	Rayong to Chathaburi (5 ind.); Samui Is, Surat Thani (6 ind.); Nakhon Si Thammarat (10 ind.); Sonkhla (5 ind.)
Spinner, striped, and pantropical spotted dolphins	W and S of Phuket (30–40 ind.)	–
Irrawaddy dolphin	Trang (5 ind.); Salai Is., Satun (20–25 ind.)	Trat (> 100 ind.); upper Gulf in Petchaburi, Samut Songkhram, Samut Sakhon, Bangkok, Samut Prakan, Chachoengsao and Conburi (about 100 ind.); Chumphon to Surat Thani (11 ind.); Khanom Bay, Nakhon Si Thammarat (21 ind.); Songkla Lake in Phatthalung and Sngkhla (36 ind.)
Finless porpoise	Inner part of Phang-nga Bay (10 ind.); Sriboya Is., Krabi (10 ind.); Trang (10 ind); Satun (20 ind.)	Petchaburi to Chonburi (25 ind.); Rayong to Trat (20 ind.); Prachuap Khiri Khan to Surat Thani (40 ind.); Khanom Bay, Nakhon Si Thammarat (20 ind.); Songkhla (5 ind.)

found in its respiratory system. One other had been struck by a hard object which presumably contributed to its stranding and eventual death.

The fourth mass stranding, of 30 false killer whales (End 517–527), was at Batok Bay (a small semi-enclosed bay) on Racha Yai Island, Phuket Province (98°22.0'E, 7°36.5'N, Table 3 and Fig. 3), at 16:00h on 26 June 2008. The weather at the time of stranding was stormy with rough seas. Staff and tourists from the Racha Hotel, together with local people, helped push 19 whales towards the open sea before 18:30h. It was decided that the remaining 11 whales should be moved to the more open Ter Bay, some 950m away (Figs 3a and 3b). A team from PMBC (about 22km from Racha Yai Island) arrived at 19:30h and whales were transferred

onto a truck using a backhoe and man power. The bed of the truck was lined with fabric (Figs 3c and 3d). At this stage, a veterinarian applied dexamethasone (anti-inflammatory, 1mg/kg) to relax the whales and disinfected their wounds with gentian violet. Ten whales were released at around 22:00h, with volunteers pushing their heads towards the open sea and helping them balance their bodies as they moved into deep water. By about 22:30h eight whales had been released. However, two whales swam back to the bay twice and a speedboat was used to transport them to deeper water. By the time these two whales were released, it was too dark to observe them. Nevertheless, there was no report of re-stranding. In summary, a total of 29 whales were returned to the sea, with only one death. This was the biggest mass

Table 3

Records of mass strandings in the Andaman Sea. End=field number (necropsy specimens only); *n* = total number of animals; M = male; F = female; BL = body length; and BW = body weight.

No.	Date	Species	Location	<i>n</i>	BL (m)	BW(kg)	Remarks
1	25 Jan. 1999	Spinner dolphin <i>Stenella longirostris</i> (End 128–133)	Ban Lang Khao, Talibong Is., Trang	9	1.77–1.9 (<i>n</i> = 6, 6M)	37–48	6 were diagnosed and 3 were lost.
2	9 Feb. 1999	Spotted dolphin <i>Stenella attenuata</i> (End 137–139)	Ban Ko Kho Khao, Phang-nga (AS)	5	1.9–2.2 (<i>n</i> = 3,3M)	57.5–81	2 dolphins were released and 3 died.
3	24 Mar. 2006	Spotted dolphin <i>Stenella attenuata</i> (End 403–407)	Mai Phai Is., Phang-nga	8	1.87–2.14 (<i>n</i> = 5, 3M, 2F)	47.5–75	5 animals died and 3 were released.
4	26 Jun. 2008	False killer whale <i>Pseudorca crassidens</i> (End 517–527)	Batok Bay, Racha Yai Is., Phuket	30	3.52 (F) 2.6–4.2 (<i>n</i> = 10)	346 (End 517 only)	1 whale died, 29 whales were released.
5	5 Jul. 2008	Rough-toothed dolphin <i>Steno bredanensis</i> (End 529–531)	Nam Bor Bay, Phuket	3	2.45–2.6 (<i>n</i> = 3,1M, 2F)	–	All were released.

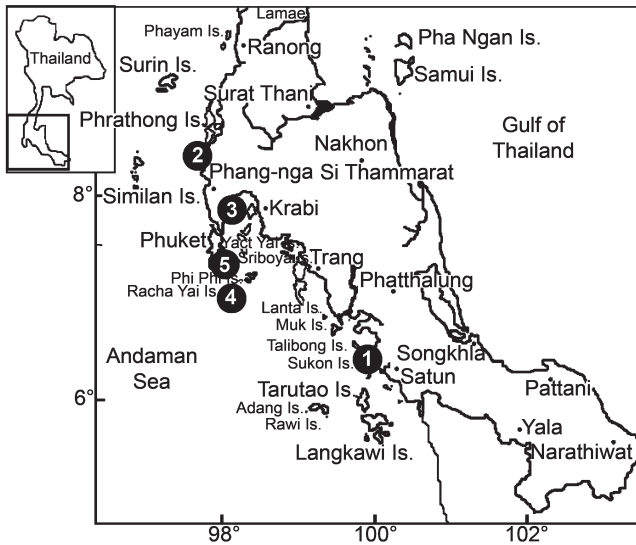


Fig. 2. Locations of the five mass strandings (black circles) in Thailand between 1993 and mid-2009. The number in each black circle corresponds to row number in Table 3.

stranding in our records in terms of the number of individuals. The body lengths of 10 whales ranged from 2.6–4.2m and they weighed approximately 300 to 400kg. The one dead female false killer whale was transferred to PMBC for a detailed examination. The head of this whale was stuck on the rocks when found. It was 3.52m long and weighed 346kg. The necropsy found no sign of diseases, but there was some water in its trachea and a small amount of sand in its

blow hole. It was concluded that this whale died from drowning.

The fifth stranding, of three rough-toothed dolphins *Steno bredanensis* (End 529–531) occurred at Nam Bor Bay, Phuket Province (98°24.1'E, 7°50.8'N), on 5 July 2008 (Table 3; Figs 2 and 4). Local fisherman saw the dolphins at 05:00h and reported to the Center. PMBC staff arrived at the beach at 07:30h. This bay has a mangrove beach and muddy-sand sea bottom. The dolphins stranded during the low tide period at a distance of approximately 1km from the shoreline, and around 200m apart. Hollows were dug beside each dolphin to allow some sea water to flow underneath in an attempt to reduce stress. The attending veterinarian then applied anti-shock medicine to the dolphins, which were all male. The dolphins were carried to the edge of sea where they were held while waiting for the tide to rise. Later, the dolphins were transported by two speedboats and released in the open sea between Nam Bor Bay and Racha Yai Island. The release was successful; the three dolphins swam out to sea together at 10:30h. Thereafter, PMBC staff patrolled the area by speedboat for approximately 30mins to check for any re-strandings.

It was difficult to ascertain the causes of these mass strandings. The first two strandings were likely caused by diseases since the dolphins involved were thin and their stomachs empty. Some of the animals also had numerous parasites in their stomachs and cysts in their genital areas.

The three dolphins from the third record appeared to be in good health. Nonetheless, one drowned and one was struck by a hard object. Animals from the fourth and the fifth mass

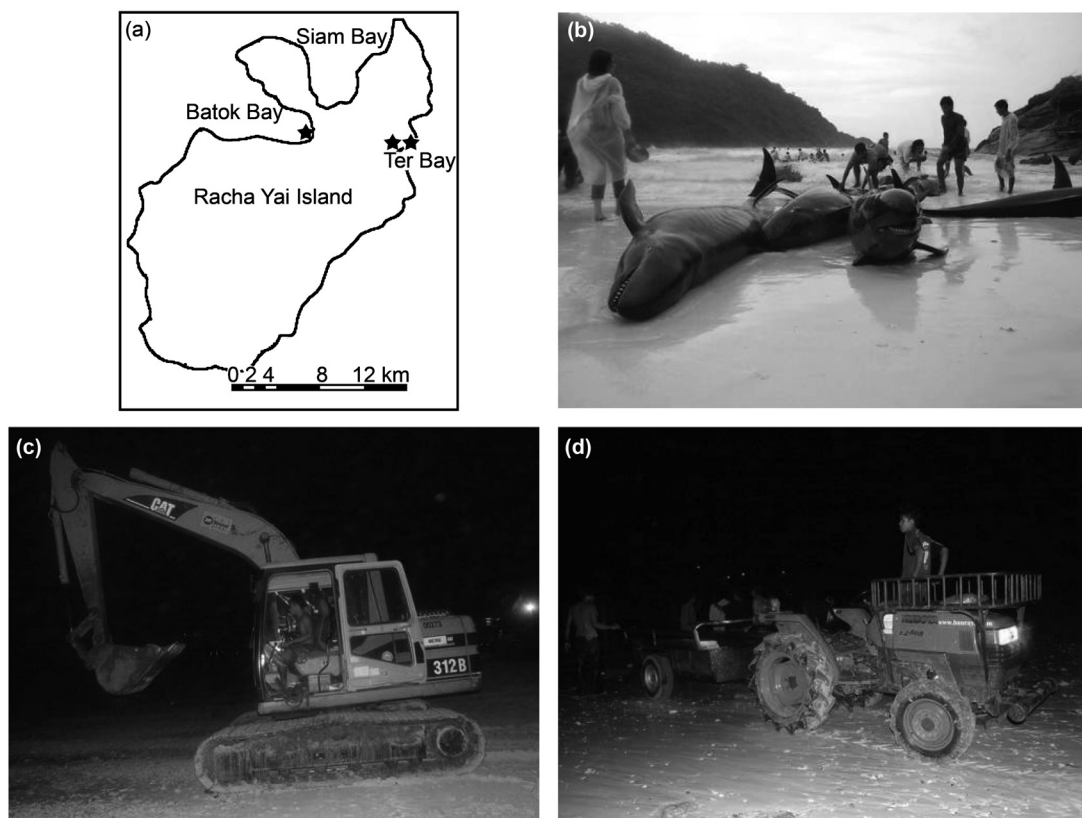


Fig. 3. (a) Map of Racha Yai Island the stranding location (showing Batok Bay) and releasing location (Ter Bay). (b) False killer whales stranded at Batok Bay. (c) A backhoe lifting stranded whales onto a truck. (d) A truck individually transferring 10 whales from Batok Bay to Ter Bay.

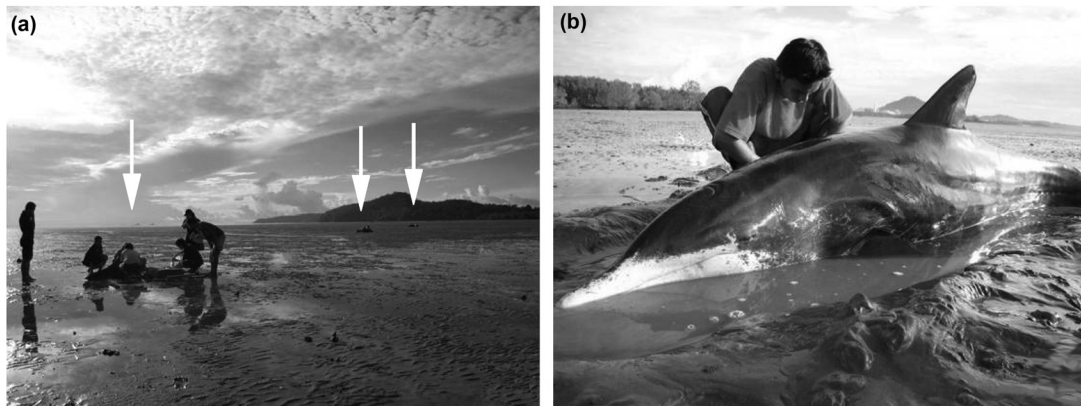


Fig. 4. (a) Three rough-toothed dolphins stranded at Nam Bor Bay, Phuket, on 5 July 2008 (arrows). (b) A hollow was dug beside the dolphin to reduce stress.

strandings also appeared to be in good health. These strandings were possibly the result of mis-navigation, especially given the topography of the stranding locations. In the case of the fourth record, 30 false killer whales swam into a small, narrow bay (Batok Bay, Racha Yai Island). The width at the mouth of the bay is 745m while its length is 925m. The whales possibly lost their way and swam into this semi-enclosed bay when sea conditions were very rough as a result of which they could not swim back to the open ocean. The 10 false killer whales transferred to Ter Bay sustained a few wounds on their bodies, but appeared generally very healthy and strong enough to be released. In the case of the fifth stranding, involving rough-toothed dolphins, Nam Bor Bay in Phuket has a length of 3.7km and a width of 2.1km. It is believed that the gently sloping beach and rapidly falling tide led to a navigational miscalculation by the dolphins causing them to be trapped in a shallow bay (Fig. 4).

In addition to these five mass stranding events, nine Irrawaddy dolphins *Orcaella brevirostris* (End 587–595) were found at Ban Bor Beach, Samut Sakhon Province (100°3.2'E, 13°3.5'N), on 25 March 2009 around noon, at low tide. The dolphins were trapped inside a man-made obstacle, a 'sand sausage', used to reduce coastal erosion. Local people helped return all the dolphins to the sea (Fig 5).

On 3 June 2009, another Irrawaddy dolphin was found stranded inside the sand bags and released. Without human intervention, all the animals would have died during low tide

because most of the area between shore and the sand bags dried out. These structures were purpose built to reduce beach erosion in the upper Gulf of Thailand, but they are clearly a problem for dolphins foraging in these areas. Solutions need to be developed to strike a balance between beach protection and safeguarding the survival of dolphin populations in the area.

CONCLUDING REMARKS

Understanding the consequences of strandings on marine mammal populations is often difficult because baseline data on the size and status of affected populations are often unavailable (Harwood, 2002). Nevertheless, in Thailand, some impacts of human activities on coastal species are evident, particularly from small-scale fisheries. Many cases of dolphin entanglements in gillnets have been documented, i.e. finless porpoises in the inner Gulf of Thailand and Irrawaddy dolphins in Songkla Lake (Ninwat *et al.*, 2008; Sirimontraporn and Sritakorn, 1995; Thongsukdee and Swangarrarak, 2005; Thongsukdee, unpub data) (Figs 6a and 6b).

Marine litter also poses problems. Two cases of cetacean deaths resulted from ingestion of or entanglement in marine litter. The first was a dwarf sperm whale in Phuket which died following ingestion of 1.6kg of plastic bags (Fig. 6c). The second was a bottlenose dolphin that was trapped in a long (45m) piece of discarded fishing net (Fig. 6d). Cetaceans are not the only marine animals affected; in

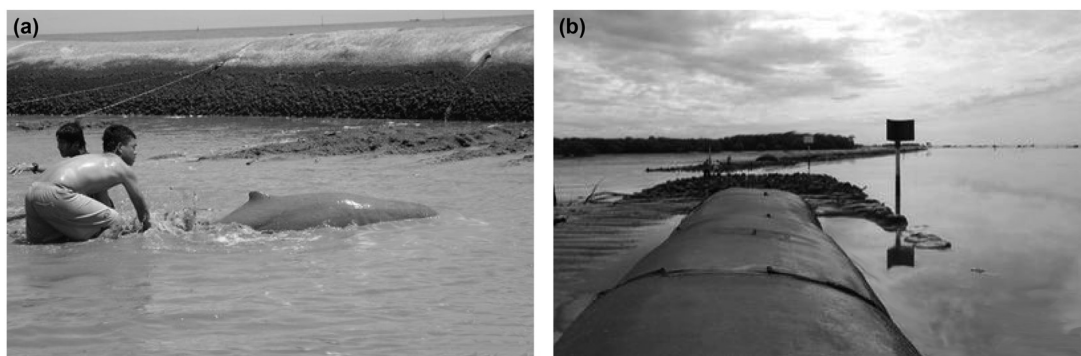


Fig. 5. Irrawaddy dolphins stranded at Ban Bor, Samut Sakhon Province, on 25 March 2009. (a) Local people trying to release the dolphins. (b) Giant sand bags protecting the beach from erosion likely trapped the dolphins during low tide. Each sand bag was about 100m in length and 4m in width with a 50m gap between the two.

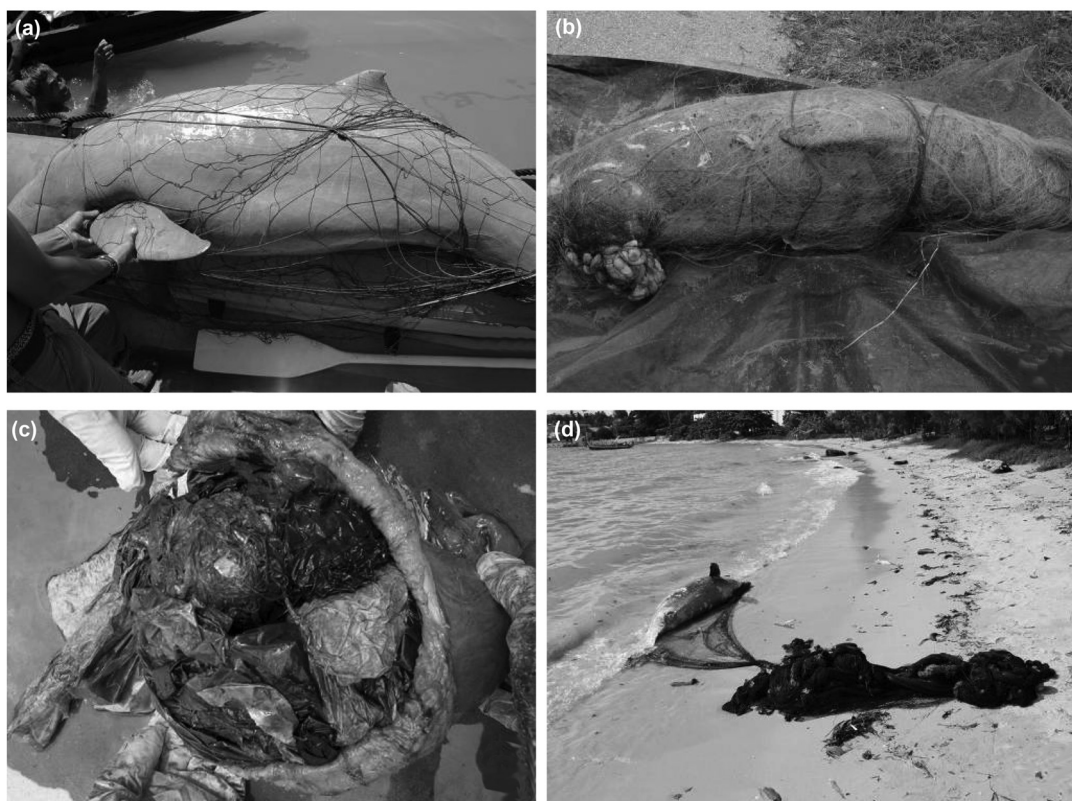


Fig. 6. Photographs illustrating some causes of cetacean death. (a) Irrawaddy dolphin in Songkhla Lake drowned by a large-mesh gillnet for catching giant catfish. (b) Irrawaddy dolphin in Songkhla Lake entangled in a small-mesh gillnet for catching sea bass. (c) Stomach of a dwarf sperm whale stranded in Phuket filled with plastic bags. (d) Bottlenose dolphin in Phuket drowned by a long piece of fishing net. [Photos (a) and (b) courtesy of Mr Santi Ninwat.]

Thailand, 26% of turtle strandings were caused by gillnets and ghost nets (Adulyanukosol and Ruangkaew, 2002).

At present there appears to be a good network for marine endangered animal stranding rescue and response along both coastlines. The DMCR has already developed protected areas for cetaceans using a ‘community based management’ approach in specific locations: (1) Irrawaddy dolphins in Bangprakong river mouth, Chachoengsao; (2) Irrawaddy dolphins in Songkhla Lake; (3) Indo-Pacific humpback dolphins in Khanom Bay, Nakhon Si Thammarat; (4) Indo-Pacific humpback dolphins and bottlenose dolphins in Tase village, Trang; and (5) Irrawaddy dolphins, Indo-Pacific humpback dolphins, and finless porpoises in Sarai Islands, Satun. The large numbers of Irrawaddy dolphins along the coast of Trat near to the Cambodia border should also be protected in a similar way. In that case it would be necessary to collaborate with Cambodia for transboundary conservation. Molecular studies are also important for species identification since some species found in Thai waters seem to be smaller than conspecifics elsewhere, e.g. dwarf spinner dolphins in the Gulf of Thailand.

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