

ANNOTATED CHECKLIST AND IDENTIFICATION KEY TO THE WHALES, DOLPHINS, AND PORPOISES (ORDER CETACEA) OF THAILAND AND ADJACENT WATERS

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ABSTRACT

Based on a critical review on the existing literature and an examination of scientific collections and specimens, 17 species of cetaceans are confirmed for Thailand. Twenty-seven cetaceans are recorded or expected to occur in Thai waters and are listed with an identification key, colour plates and localities. The only baleen whale so far recorded from Thailand is *B. edeni* (Sittang whale).

INTRODUCTION

Our knowledge of the whales, dolphins, and porpoises of Thailand and adjacent waters is scarce. SUVATTI (1950) and MENASVETA (1980) listed only three cetacean species for Thailand whilst PILLERI (1973) reported on 7 species. LEKAGUL & MCNEELY (1977), seemingly overlooking the work of Pilleri, reported on 12 nominal species, but only 10 of these are considered as valid (Table 1). Two species listed by these authors, the sei whale (*Balaenoptera borealis*) and the minke whale (*Balaenoptera acutorostrata*), were based on material belonging to yet a third species: the Bryde's or Sittang whale (*Balaenoptera edeni*), erroneously regarded as a junior synonym of the minke whale or conspecific with the sei whale (ANDERSEN & KINZE, 1993b).

YENBUTRA (1988), mostly following LEKAGUL & MCNEELY (1977), changed the name of the 'Malayan dolphin' from *Stenella malayana* to *Stenella attenuata*, the pantropical spotted dolphin. However, it cannot be established with certainty from LEKAGUL & MCNEELY's description whether *Stenella attenuata* or the spinner dolphin (*Stenella longirostris*) was treated. Both species have been recorded for Thailand. PILLERI (1973) provided evidence for both species, although provisionally assigning them to the *Stenella dubia-frontalis-attenuata* group. MIYAZAKI (1986) gave information on specimens of both species from the Gulf of Thailand and PERRIN *ET AL.* (1989) described a dwarf form of the spinner dolphin from the Gulf of Thailand.

In a preliminary draft we reported the false killer whale (*Pseudorca crassidens*) from Thailand (ANDERSEN & KINZE, 1991). CHANTRAPORNSYL *ET AL.* (1991) provide information on the first Thai record of the dwarf sperm whale (*Kogia simus*) from Phuket Island and adjacent waters.

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Table 1. Cetaceans occurring in Thai waters according to earlier records.

Species	Suvatti 1950	Pilleri 1973	Lekagul & McNeely 1977	Yenbutra 1988	This paper
<i>Physeter macrocephalus</i>		X	X	X	X
<i>Kogia simus</i>					X
<i>Mesoplodon ginkgodens</i>					X
<i>Steno bredanensis</i>			X ¹		X
<i>Sousa chinensis</i>	X		X ²		X
<i>Tursiops aduncus</i>		X	X ³		X
<i>Delphinus capensis</i>			X ⁴	X ⁴	X
<i>Stenella longirostris</i>			X ⁵		X
<i>Stenella attenuata</i>		X ⁶		X ⁷	X
<i>Stenella coeruleoalba</i>					X
<i>Peponocephala electra</i>		X			X
<i>Globicephala macrorhynchus</i>			Expected to occur		X
<i>Pseudorca crassidens</i>					X
<i>Orcinus orca</i>					X
<i>Orcaella brevirostris</i>	X	X	X	X	X
<i>Neophocaena phocaenoides</i>		X	X	X	X
<i>Balaenoptera edeni</i>	X	X	X ⁸	X ⁸	X

¹ No specimen to verify; ² Given as three nominal species; ³ Given as *T. truncatus*; ⁴ Confused with *S. longirostris*; ⁵ Given as *S. malayana*; ⁶ Preliminary identification; ⁷ Based on *S. malayana*; ⁸ Given as *B. acutorostrata* and *B. borealis*

The taxonomic and nomenclatorial confusion arising from earlier works and the new information collected demands a revised up-to-date checklist. This paper lists 27 cetaceans recorded or expected to occur in Thai waters and provides an identification key with distributions maps.

MATERIALS AND METHODS

This paper is based on a critical review of relevant papers as well as an examination of scientific collections and specimens on display at temples, army camps and hotels all over Thailand. Interview surveys were conducted in 1991 along the Eastern Seaboard (ANDERSEN & KINZE, 1991), and in 1993 along the western Gulf and Andaman Sea coastline (ANDERSEN & KINZE, 1993a, 1993b). Unpublished information was kindly made available to us at several scientific institutions. In addition, several specimens were dissected. The list covers all known records from Thailand through 1993.

The identification key was based on general information on the species and on experiences gained during dissection. For each species Thai records are listed as far as possible in chronological order. For some species a geographical subdivision has been applied. The records provide the following information as completely as possible: record number, date, locality, sex, total length (TL), information on specimen, institution and references. The locality is given as district and province wherever possible. For some specimens the exact locality of origin is not known, but only the harbour where the specimen was landed. If available, this information is given in parentheses. The numbers given on the distribution maps follows numbers given in the record list.

The total length is given as the distance from the tip of the head to the notch in straight line parallel to the body axis (NORRIS, 1961). Length measurements taken in a different or unknown way are given as "reported lengths". The transcribed names in square brackets follows the Romanization Guide of The Royal Institute, 1982.

The following abbreviations are used for the scientific collections: BIMS, Bang Saen Institute of Marine Science; NHCU, Natural History Museum Chulalongkorn University; KUMF, Kasetsart University Museum of Fisheries (former college of fisheries); FSKU, Faculty of Science, Kasetsart University; NICA, National Institute of Coastal Aquaculture, Songkhla; PMBC, Phuket Marine Biological Center; NRC, National Reference Collection, Bangkok; EMDEC, Eastern Marine Fisheries Development Center, Ban Phe; OFD, Oceanic Fisheries Division, Samut Prakarn.

LIST OF SPECIES

FAMILY PHYSETERIDAE (sperm whales)

1. *Physeter macrocephalus*, sperm whale

Thai name: ปลาวาฬหัวทุย [plawan hua thui]

Pilleri (1973): *Physeter catodon*

Lekagul & McNeely (1977): *Physeter catodon*

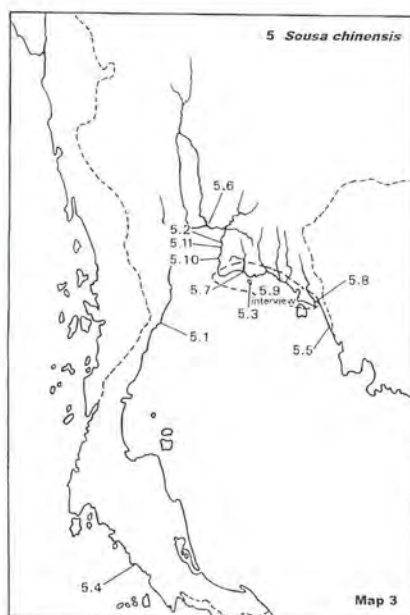
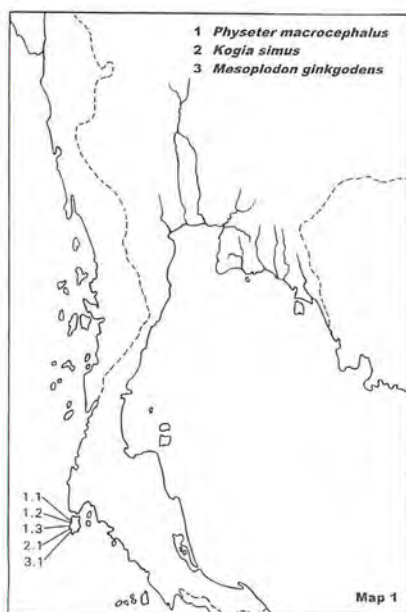
Records (see map 1)

1.1. Undated (before 1973). Phuket Island, Phuket Prov. Sex and TL not known. According to PILLERI (1973) kept in the (old) Phuket Fishery Station; apparently lost. Photographs in PILLERI (1973) and PILLERI & GIHR (1974).

1.2. Undated (before 1987). Lower jaws seen in Phuket Harbour, Phuket Prov. Sex and TL not known. Photograph in ZMUC files.

1.3. 7 June 1993. Surin Beach, Phuket Island, Phuket Prov. Skeleton and cast of female, 300 cm. PMBC.

Unconfirmed records: Teeth of sperm whales believed to be from Thai waters are in the National Museum (LEKAGUL & MCNEELY, 1977). ANDERSEN & KINZE (1991) listed a sperm whale from Cha Am District from their interview survey. No specimen has been identified and the record remains doubtful.



Maps 1–4. Distribution of records for *P. macrocephalus*, *K. simus*, *M. ginkgodens*, *S. bredanensis*, *D. capensis*, *S. attenuata*, *S. coeruleoalba*, *S. chinensis* and *T. aduncus*.

2. *Kogia simus*, dwarf sperm whale

Thai name: ปลาวาฬหัวทุยแคระ [plawan hua thui khrae]

Records (see map 1)

2.1. July 1987. Patong Beach, Phuket Island, Phuket Prov. Male skeleton, 227 cm. PMBC. CHANTRAPORNSYL *ET AL.* 1991.

FAMILY ZIPHIIDAE (beaked whales)**3. *Mesoplodon ginkgodens*, ginkgo-toothed beaked whale**

Thai name: ปลาวาฬฟันสองซี่ [plawan fan song si]

Records (see map 1)

3.1. 7 June 1989. Patong Beach, Phuket Island, Phuket Prov. Photographs of female, 208 cm. ZMUC files (Fig. 1).

Note: Only skull characters provide a safe identification of juvenile and female individuals of most species of *Mesoplodon*. The external features, especially of juvenile individuals, are poorly known. The species identification therefore has to be considered tentative, until more material becomes available. The identification key lists two further species of *Mesoplodon* likely to occur in Thai waters.

FAMILY DELPHINIDAE (oceanic or true dolphins)**4. *Steno bredanensis*, rough-toothed dolphin**

Thai name: ปลาโลมาฟันห่าง [plaloma fan hang]

Records (see map 2)

4.1. 30 August 1993. Chalong Bay, Phuket Island, Phuket Prov. Skeleton of female, 220 cm. PMBC.

Unconfirmed records: THIEMMEDH (1968), quoted as Jinda (1968) by LEKAGUL & MC NEELY (1977), reported the species to occur in the Gulf of Thailand based on a skull in the Kasetsart collection identified by T. Kasuya. LEKAGUL & MCNEELY (1977) were unable to trace the skull.

5. *Sousa chinensis*, Indopacific humpback dolphin (Fig. 2)

Thai name: ปลาโลมาเผือก หรือ ปลาโลมาหลังโตนก [plaloma phuak, plaloma langnok]

SUVATTI (1950): *Sotalia sinensis*

PILLERI & GIHR (1974): *Sousa plumbea*

SMYTH (1898): *D. sinensis*

BONHOTE (1903): *Sotalia chinensis*

KLOSS (1916): *Sotalia sinensis*

LEKAGUL & MCNEELY (1977): *Sotalia plumbea*
 LEKAGUL & MCNEELY (1977): *Sotalia borneensis*
 LEKAGUL & MCNEELY (1977): *Sotalia chinensis*
 MENASVETA (1980): *Sotalia sinensis*

Records (see map 3)

- 5.1. Undated. Prachuap Khirikhan Prov. Skull. Sex and TL not known. PMBC.
- 5.2. Undated. Chonburi Prov. Stuffed specimen. Sex and TL not known. Seen in Bangkok by LEKAGUL & MCNEELY (1977).
- 5.3. November 1895. Sighting near Koh Samet, Rayong Prov. SMYTH (1898).
- 5.4. 1901 or 1902. Estuary of Trang River, Kantang District, Trang Prov. Sex and TL not known. BONHOTE (1903).
- 5.5. 7 December 1914. Sighting near Khlong Yai, Trat Prov. KLOSS (1916).
- 5.6. February 1926. Gulf of Siam. Skull (1937.6.22.1) Sex and TL not known. Natural History Museum, London. PILLERI & GIHR (1972).
- 5.7. 27 January 1963. Locality not known (landed at Bangkok Harbour). Skeleton. Sex and TL not known. KUMF.
- 5.8. 1975. Rayong, Rayong Prov. Stuffed specimen. Sex not known, 210 cm. BIMS.
- 5.9. 1991. Occurs along the coasts of Trat and Laem Ngop Districts (Trat Prov.), Laem Sing and Pak Nam Prasae Districts, (Chantaburi Prov.), Ban Phe and Rayong Districts (Rayong Prov.) and Sattahip District (Chonburi Prov.). Interview survey (ANDERSEN & KINZE 1991).
- 5.10. Sightings reported off Naklua, Chonburi Prov. December 1992– January 1993. Burgers (pers. comm.).
- 5.11. February 1993. Bang Lamung, Chonburi Prov. Skeleton of male, 241 cm. BIMS.

Misidentification: 'N.A.' (=Nelson Annandale) in BONHOTE (1903) reported a sighting of a school of 5–6 animals on 12 May (1901) from Pak Phayun in the upper Songkhla Lake (Thale Luang) which he thought were *Platanista* sp. ?, a kind of river dolphin. He described them as being not much over 4 ft. (=122 cm) long and being of uniform rich chocolate brown color. 13 years later (Annandale, 1916) he described this cetacean as 'remarkable for its small size, long narrow snout and bright brown colour'. ROBINSON (1927) mentions it as an undescribed species from the Thale sap. LEKAGUL & MCNEELY (1977) interpreted the original sighting as of *Sotalia plumbea* = *Sousa chinensis*. However, it is beyond doubt that this 'brown cetacean' is a misidentified false gavia (*Tomistoma schlegelii*), which according to SMYTH (1898) was seen 'in considerable number' in the 1890's.



Figure 1. A female specimen of ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*) stranded 7 June 1989 on Patong Beach.



Figure 2. The two colour morphs of the Indopacific humpback dolphin (*Sousa chinensis*).



Figure 3. Extremely long-beaked common dolphins (*Delphinus capensis*) off Koh Samui, 22 January 1973.



Figure 4. Sittang whale (*Balaenoptera edeni*) skeleton kept at Wat Phra Mahathat, Muang District, Nakorn Sri Thammarat Province (species record 17.3).



Figure 5. Sittang whale (*Balaenoptera edeni*) skeleton kept in the cave of Wat Tham Khao Phlu, Pathio District, Chumphon Province (species record 17.12.).

6. *Tursiops aduncus*, tropical bottlenosed dolphin

Thai name: ปลาโลมาปากขวด [plaloma pak khwad]

PILLERI (1973): *Tursiops aduncus*

LEKAGUL & MCNEELY (1977): *Tursiops truncatus*

Nomenclatorial note: We chose to treat the tropical bottlenose dolphin of the Indopacific as a separate species due to its smaller size and heavier spotting.

Records (see map 4)

Specimens from 'Bangkok':

6.1. Undated. Locality of origin not known (landed in 'Bangkok'). Mounted skeleton. Sex and TL not known. NHMCU.

6.2. Undated. Locality of origin not known (landed in 'Bangkok'). Stuffed specimen. Sex not known, 151 cm. KUMF.

6.3. Undated. Locality of origin not known (landed in 'Bangkok'). Stuffed specimen. Sex not known, 190 cm. KUMF.

6.4. Undated. Locality of origin not known (landed in 'Bangkok'). Stuffed specimen. Sex not known, 194 cm. FSKU.

6.5. Undated. Locality of origin not known (landed in 'Bangkok'). Stuffed specimen. Sex not known, 163 cm. FSKU.

6.6. 27 January 1963. Locality of origin not known (landed in 'Bangkok'). Skeleton. Sex and TL not known. KUMF.

6.7. 10 November 1964. Locality of origin not known (acquired at Bangkok Fish market). Female, 222 cm. Files of KUMF.

Specimens from Bang Saen:

6.8. Undated. Bang Saen, Chonburi Prov. Skull. Sex and TL not known. BIMS.

6.9. 1974. Bang Saen, Chonburi Prov. Stuffed specimen. Sex not known, 198 cm. BIMS.

6.10. 1974. Bang Saen, Chonburi Prov. Stuffed specimen. Sex not known, 166 cm. BIMS.

Specimens from Phuket:

6.11. Undated. Phuket Island, Phuket Prov. Cast. Sex not known, 202 cm. PMBC.

Specimens from Songkhla:

6.12. Undated. Songkhla, Songkhla Prov. Stuffed specimen. Sex not known, 155 cm. Songkhla Fishery Station. PILLERI (1973), PILLERI & GIHR (1974).

6.13. Undated. Songkhla, Songkhla Prov. Stuffed specimen, 230 cm. Sex not known. Fishery Station, Songkhla. PILLERI (1973), PILLERI & GIHR (1974).

6.14. Undated. Songkhla, Songkhla Prov. Stuffed specimen. Sex not known, 155 cm. NICA.

- 6.15. Undated. Songkhla, Songkhla Prov. Stuffed specimen. Sex not known, 162 cm. NICA.
- 6.16. 8 February 1973. Songkhla, Songkhla Prov. Male, 130 cm. Pilleri collection, no.: 560. PILLERI (1973).
- 6.17. 8 February 1973. Songkhla, Songkhla Prov. Male, 134 cm. Pilleri collection, no.: 561. PILLERI (1973).
- 6.18. 8 February 1973. Songkhla, Songkhla Prov. Female, 210 cm. Pilleri collection, no.: 562. PILLERI (1973).
- 6.19. January 1992. Songkhla, Songkhla Prov. Female, ca. 200 cm. With a 46 cm embryo. NICA.
- 6.20. 5 June 1965. Huahin, Prachuab Khirikhan Prov. Skeleton. Sex and TL not known. KUMF.
- 6.21. Before 1982. Prachuab Khirikhan, Prachuab Khirikhan Prov. Skull. Sex and TL not known. NRC.
- 6.22. October 1981. Tarutao, Satun Prov. Skeleton. Sex & TL not known. Tarutao Marine National Park.
- 6.23. 21 July 1990. Sighting south of Phuket Island, Phuket Prov. (6°55'N, 97°5'E) of a mixed school with *Globicephala macrorhynchus* (CCK unpublished).
- 6.24. 1991. Occurs at Trat District (Trat Prov.), Laem Sing and Paknam Krasae Districts (Chantaburi Prov.), Ban Phe and Rayong Districts (Rayong Prov.) and Sattahip District (Chonburi Prov.). Interview survey (ANDERSEN & KINZE, 1991).
- 6.25. June 1993. Laem Mae Phim, Rayong Prov. Skeleton of female, 191.5 cm. EMDEC.

7. *Delphinus capensis*, long-beaked common dolphin (Fig. 3)

Thai name: ปลาโลมาปากยาว [plaloma pak yao]

?LEKAGUL & MCNEELY (1977): *Delphinus delphis*

?YENBUTRA (1980): *Delphinus delphis*

Nomenclatorial note: Only recently two species of common dolphin have been recognised: a short-beaked species (*D. delphis*) and a long-beaked species (*D. capensis*) (HEYNING & PERRIN, 1994). Earlier records of common dolphins from Thai waters are very dubious, and so far only the long-beaked species is properly documented. The description given for *Delphinus delphis* by LEKAGUL & MCNEELY (1977) is very ambiguous and intertwined with that of a *Stenella longirostris*.

Records (see map 2)

7.1. 22 January 1973. Off Koh Samui, Surathani Prov. Sighting of a school of 40–50 individuals. Color slides in ZMUC files (Fig. 3). Pers. comm. and courtesy E. Krabbe.

Unconfirmed records: LEKAGUL & MCNEELY (1977) report a specimen from 'Ranong'. However, the specimen photographs shown under this species heading are that of a *Stenella longirostris*.

8. *Stenella longirostris*, spinner dolphin

Thai name: ปลาโลมากระโดด [plaloma kradod]

PILLERI & GIHR (1974): *Stenella* sp.

PILLERI & GIHR (1974): *Stenella dubia-frontalis-attenuata* (in part)

LEKAGUL & MCNEELY (1977): *Stenella malayana*.

? YENBUTRA (1988): *Stenella attenuata*.

PERRIN *ET AL.* (1989): Dwarf form of *Stenella longirostris*.

Records (see map 5)

‘Bangkok’:

8.1. Undated. Bight of Bangkok. Skull. Sex and TL not known. College of Fisheries, Kasetsart University. PILLERI & GIHR (1974). LEKAGUL & MCNEELY (1977) under *D. delphis*. Specimen apparently lost.

8.2. Undated. Bight of Bangkok. Skull. Sex and TL not known. College of Fisheries, Kasetsart University. PILLERI & GIHR (1974). Specimen apparently lost.

8.3. Undated. Locality of origin not known (landed at ‘Bangkok Harbour’). Stuffed specimen. Sex unknown, 129 cm. KUMF.

8.4. Undated. Locality of origin not known (landed at ‘Bangkok Harbour’). Stuffed specimen. Sex unknown, 109 cm. FSKU.

8.5. Undated. Locality of origin not known (landed at ‘Bangkok Harbour’). Stuffed specimen. Sex unknown, 128 cm. FSKU.

8.6. Undated. Locality of origin not known (landed at ‘Bangkok Harbour’). Stuffed specimen. Sex unknown, 90 cm. MNHCU.

8.7. 28 October 1965. Locality of origin not known (landed at ‘Bangkok Harbour’). Sex not known, 110 cm. Files of the Faculty of Fisheries, Kasetsart University. Maybe identical with record 8.4.

8.8. Undated. Bang Saen, Chonburi Prov. Mounted skeleton. Sex and TL unknown. BIMS.

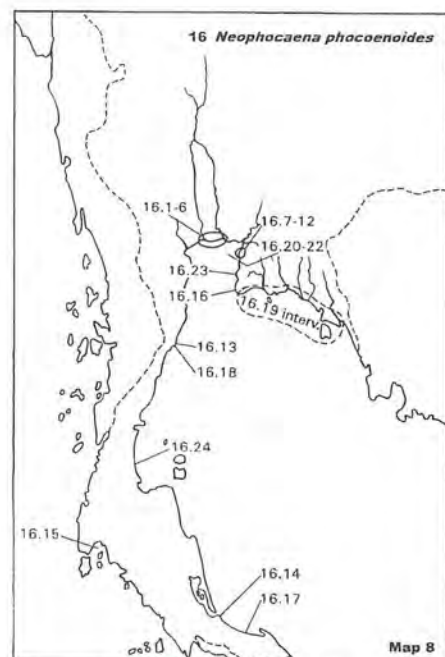
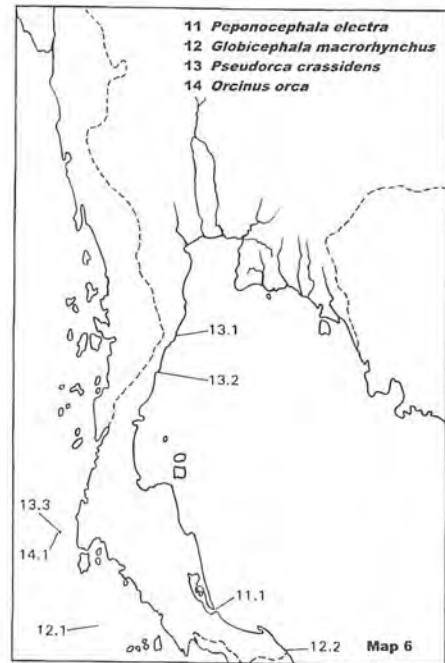
8.9. Undated. Bang Saen, Chonburi Prov. Mounted skeleton. Sex and TL unknown. BIMS.

8.10. Undated. Bang Saen, Chonburi Prov. Stuffed specimen. Female, 143 cm. BIMS.

8.11. 1974. Bang Saen, Chonburi Prov. Stuffed specimen. Sex unknown, 128 cm. BIMS.

8.12. 15 March 1970. 2 km off Samut Songkram, Samut Songkram Prov. Skeleton. Female, 141 cm. National Science Museum Tokyo no. 25851. MIYAZAKI (1986), GILPATRICK *ET AL.* (1987), PERRIN *ET AL.* (1989).

8.13. 21 September 1970. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Sex not reported, 111 cm. National Science Museum Tokyo no. 24971. MIYAZAKI (1986), PERRIN *ET AL.* (1989).



Maps 5-8. Distribution of records for *S. longirostris*, *P. electra*, *G. macrorhynchus*, *P. crassidens*, *O. orca*, *O. brevirostris*, *N. phocaenoides*.

8.14. 1970 or 1971. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Sex and TL not reported. National Science Museum Tokyo no. 24972. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.15. 10 January 1971. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Female, 94 cm. National Science Museum Tokyo no. 24973. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.16. 30 December 1971. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Female, 107 cm. National Science Museum Tokyo no. 24974. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.17. 1970–71. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Sex not reported, 127 cm. National Science Museum, Tokyo no. 24975. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.18. 1970–71. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Male, 129 cm. National Science Museum Tokyo no. 24976. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.19. 1970–71. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Female, 133 cm. National Science Museum Tokyo no. 24977. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.20. 1970–71. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Male, 136 cm. National Science Museum Tokyo no. 24978. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.21. 1970–71. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Sex and TL not reported. National Science Museum Tokyo no. 24979. MIYAZAKI (1986), PERRIN *ET AL.* (1989).

8.22. 6 April 1982. 5 km east of Phuket (7°52'N 9°27'E), Phuket Prov. Sighting. Leatherwood (1986).

8.23. 1991. Occurs off Laem Ngop District (Trat Prov.), Laem Sing District (Chantaburi Prov.), Ban Phe and Rayong Districts (Rayong Prov.) and Sattahip District (Chonburi Prov.). Interview survey (ANDERSEN & KINZE, 1991).

8.24. 7 January 1992. East off Koh Samet, Rayong Prov. Sighting of a single individual. CCK unpublished.

Stenella sp. records assigned to this species.

Listed by PILLERI (1973) and PILLERI & GIHR (1974) as belonging to *Stenella dubia-frontalis-attenuata* group, but the tooth counts suggest *S. longirostris*.

8.25. Undated. Songkhla waters, Songkhla Prov. Stuffed specimen. Female, 143 cm. Fishery Station Songkhla. PILLERI (1973), PILLERI & GIHR (1974). Specimen apparently lost.

8.26. Undated. Songkhla waters, Songkhla Prov. Stuffed specimen. Female, 150 cm. Fishery Station Songkhla. PILLERI (1973), PILLERI & GIHR (1974). Specimen apparently lost.

9. *Stenella attenuata*, pantropical spotted dolphin

Thai name: ปลาโลมาลายจุด [plaloma lai chut]

PILLERI (1973): *Stenella dubia-frontalis-attenuata* (in part)

Records (see map 2)

9.1. Undated. Songkhla waters, Songkhla Prov. Stuffed specimen. Sex not known, 196 cm. Fishery Station. Songkhla. PILLERI (1973). Specimen apparently lost.

9.2. Undated. Phuket Island, Phuket Prov. Stuffed specimen. Sex not known, 166 cm. PMBC.

9.3. 23 December 1970. Gulf of Thailand (landed at Samut Sakorn). Skeleton. Female, 164 cm. National Science Museum Tokyo no. 24852. MIYAZKI (1986).

10. *Stenella coeruleoalba*, striped dolphin

Thai name: ปลาโลมาแถบ [plaloma thaep]

Records (see map 2)

10.1. 1991. Reported to occur at Khong Yai District (Trat Prov.), Laem Sing District (Chantaburi Prov.), Ban Phe and Rayong Districts (Rayong Prov.) and Sattahip District (Chonburi Prov.). Interview survey (ANDERSEN & KINZE 1991).

10.2. 8 August 1992. Patong Beach. Phuket Island, Phuket Prov. Skeleton and cast. Male, 197.5 cm. PMBC.

11. *Peponocephala electra*, melon-headed whale

Thai name: ปลาวาฬหัวกลม or ปลาวาฬหัวแตงโม [plawan hua klom, plawan hua taengmo]

Records (see map 6)

11.1. Undated. Songkhla waters, Songkhla Prov. Stuffed specimen. Sex unknown, 237 cm. Songkhla Fishery Station. PILLERI (1973). Specimen apparently lost.

12. *Globicephala macrorhynchus*, short-finned pilot whale

Thai name: ปลาวาฬน้ำร่อง [plawan nam rong]

Records (see map 6)

12.1. 21 July 1990. Sighting south of Phuket Island. (6°55'N 97°5'E) of a mixed school with *Tursiops aduncus* (CCK unpublished).

12.2. November 1992. Narathiwat Province. Life stranding. Female? 360 cm. Photographs Narathiwat Fishery Station.

13. *Pseudorca crassidens*, false killer whale

Thai name: ปลาวาฬเพชรฆาตดำ [plawan phechakhat dam]

Records (see map 6)

13.1. Before 1982. Prachuap Khirikhan, Prachuab Khirikhan Prov. Skull. Sex and TL not known. NRC.

13.2. February 1992. Bang Saphan Noi, Prachuab Khirikhan Prov. Stuffed specimen and photographs of a male, 357 cm. Prachuap Khirikhan Marine Aquaculture Development Center. Specimen apparently lost.

13.3. 1993. Similan Islands, Ranong Prov. Sighting of a school. FORMAN (1993).

14. *Orcinus orca*, killer whale

Thai name: ปลาฉลามเพชฌฆาต [plawan phechakhat]

Records (see map 6)

14.1. 1993. Similan Islands, Ranong Prov.. Sighting of a school of 40. Photographs in the files of PMBC.

15. *Orcaella brevirostris*, Irrawaddy dolphin (See cover photograph)

Thai name: ปลาโลมาอิรวดี [plaloma irawadi]

SMYTH (1898): "porpoises".

BONHOTE (1903): *Orcaella brevirostris*

KLOSS (1916): *Orcella brevirostris*

GYLDENSTOLPE (1919): *Orcaella brevirostris*

ROBINSON (1927): *Orcaella brevirostris*

SUVATTI (1950): *Orcaella brevirostris*

Records (see map 7)

15.1. Undated. Upper Bight of Bangkok at the mouth of the Chao Phraya River. No details given. MORZER-BRUYNS (1966).

15.2. Undated. Inland Sea, Songkhla Prov. No details given. ROBINSON (1927).

15.3. Undated. Bang Saen, Chonburi Prov. Stuffed specimen. Sex and TL not known. BIMS.

15.4. Undated. Bang Saen, Chonburi Prov. Mounted skeleton. Sex and TL not known. BIMS.

15.5. Nov. 1895. Near Koh Samet, Rayong Prov. Sighting. SMYTH (1898).

15.6. August 1896. Khlong Luang, Phatthalung Prov. Sighting. SMYTH (1898).

15.7. October 1901. Tanjong, Pattani Prov. Male, 220 cm. BONHOTE (1903). PILLERI & GIHR (1974).

15.8. October 1901. Tanjong, Pattani Prov. Male, 275 cm. BONHOTE (1903). PILLERI & GIHR (1974).

15.9. 6 December 1914. Klong Yai, Trat Prov. Skull. Male, 213 cm (7 ft. not 3660 mm). KLOSS (1916).

15.10. 1971. Thale Luang north of Pak Phayun. Phattalung Prov. Sex not known. 193 cm. Fishery Station. PILLERI (1973).

- 15.11. 1971. Thale Luang north of Pak Phayun. Phattalung Prov. Sex and TL not known. College of Education. PILLERI (1973).
- 15.12. 1971. Thale Luang north of Pak Phayun. Phattalung Prov. Sex and TL not known. College of Education Station. PILLERI (1973).
- 15.13. 2 February 1985. Naklua, Chonburi Prov. Sex and TL not known. Burgers pers. comm..
- 15.14. 18 January 1990. Songkhla, Songkhla Prov. Stuffed specimen. Sex not known, 219 cm. NICA.
- 15.15. 18 January 1990. Songkhla, Songkhla Prov. Stuffed specimen. Sex not known, ca. 219 cm. NICA
- 15.16. May 1990. Bang Saen, Chonburi Prov. Skeleton. Female, 207 cm. BIMS. Specimen apparently lost.
- 15.17. 1991. Occurs off Trat and Laem Ngop Districts (Trat Prov.), Laem Sing District (Chantaburi Prov.), Ban Phe and Rayong Districts (Rayong Prov.). Interview survey (ANDERSEN & KINZE, 1991).
- 15.18. 21 October 1992. Naklua, Chonburi Prov. Sex and TL not known. Photographs in ZMUC files. Burgers (pers. comm.).

PHOCOENIDAE (true porpoises)

16. *Neophocaena phocaenoides*, finless porpoise

Thai name: ปลาโลมาหัวบาตรหลังเรียบ [plaloma lang riab]

PILLERI (1973): *Neomeris phocaenoides*

Records (see map 8)

- 16.1. Undated. Locality of origin not known. 'Bangkok'. Mounted skeleton. Sex and TL not known. NHMCU.
- 16.2. Undated. Locality of origin not known. 'Bangkok'. Skeleton. Sex and TL not known. NHMCU.
- 16.3. Undated. Locality of origin not known (landed at Bangkok harbour). Stuffed specimen. Sex unknown, 120 cm.. FFKU.
- 16.4. Undated. Locality of origin not known Bangkok. Stuffed specimen. Female, 102 cm. FSKU.
- 16.5. Undated. Locality of origin not known Bangkok. Neonate in alcohol. Sex not known, 58 cm. FSKU.
- 16.6. Undated. Locality of origin not known Bangkok waters. Stuffed specimen. Sex unknown, 128 cm. Kasetsart University (PILLERI 1973). Maybe identical with record 16.3.

- 16.7. Undated. Bang Saen, Chonburi Prov. Skeleton. Sex and TL unknown. BIMS.
- 16.8. Undated. Bang Saen, Chonburi Prov. Skeleton. Sex and TL unknown. BIMS.
- 16.9. Undated. Bang Saen, Chonburi Prov. Skeleton. Sex and TL unknown. BIMS.
- 16.10. Undated. Bang Saen, Chonburi Prov. Stuffed animal. Sex not known, 138 cm. BIMS.
- 16.11. Undated. Bang Saen, Chonburi Prov. Mounted skeleton. Sex and TL not known. BIMS.
- 16.12. April 1991. Bang Saen, Chonburi Prov. Skeleton. Male, 108 cm. BIMS, no. 1.
- 16.13. Undated. Prachuab Khirikhan, Prachuab Khirikhan Prov. Female fetus in alcohol, ca. 40 cm. Prachuab Khirikhan Marine Aquaculture Development Center.
- 16.14. Undated. Songkhla, Songkhla Prov. Female, 130 cm. With a 77 cm male fetus. Fishery Station Songkhla (PILLERI, 1973). Specimen apparently lost.
- 16.15. Undated. Phang Nga, Phang Nga Prov. Stuffed specimen. Sex not known, 115 cm. Fishery Station Phang Nga (PILLERI, 1973).
- 16.16. 1986. Bang Sarae, Chonburi Prov. Stuffed specimen. Female, 85 cm. Ban Sarae Beach Resort, Reception.
- 16.17. April/May 1989. Thepa, Pattani Prov. Neonate male in formalin, 63 cm. NICA.
- 16.18. November/December 1989. Prachuab Khirikhan, Prachuab Khirikhan Prov. Female fetus ca. 55 cm. Prachuab Khirikhan Marine Aquaculture Development Center. Specimen lost.
- 16.19. 1991. Occurs off Trat and Laem Ngop Districts (Trat Prov.) and Laem Sing District (Chantaburi Prov.). Interview survey (ANDERSEN & KINZE, 1991).
- 16.20. April 1992. Koh Si Chang, Chonburi Prov. Skeleton. Female, 85 cm. BIMS, no. 4. Specimen apparently lost.
- 16.21. April 1992. Koh Si Chang, Chonburi Prov. Skeleton. Female, 99 cm. BIMS, no. 5. Specimen apparently lost.
- 16.22. April 1992. Koh Si Chang, Chonburi Prov. Sex and TL not known. Specimen lost.
- 16.23. January 1993. Naklua, Chonburi Prov. Sex and TL not known. Burgers (pers. comm.).
- 16.24. June 1993. Khanduli, Tha Chana Bay, Chumphon Prov. Sex and TL not known. Stacey (pers. comm.).

BALAENOPTERIDAE (rorquals)

17. *Balaenoptera edeni*, sittang whale

Thai name: ปลาวาฬลิททาง [plawan sittang]

- SUVATTI (1950): *Balaenoptera edonii* Small Indian fin whale.
THIEMMEDH (1968): *Balaenoptera* sp. Fin whale.
PILLERI (1973): *Balaenoptera edoni*.
LEKAGUL & MCNEELY (1977): *Balaenoptera acutorostrata* Minke whale.
LEKAGUL & MCNEELY (1977): *Balaenoptera borealis* Sei whale.
MENASVETA (1980): *Balaenoptera edonii* (misspelling) Small Indian fin whale.

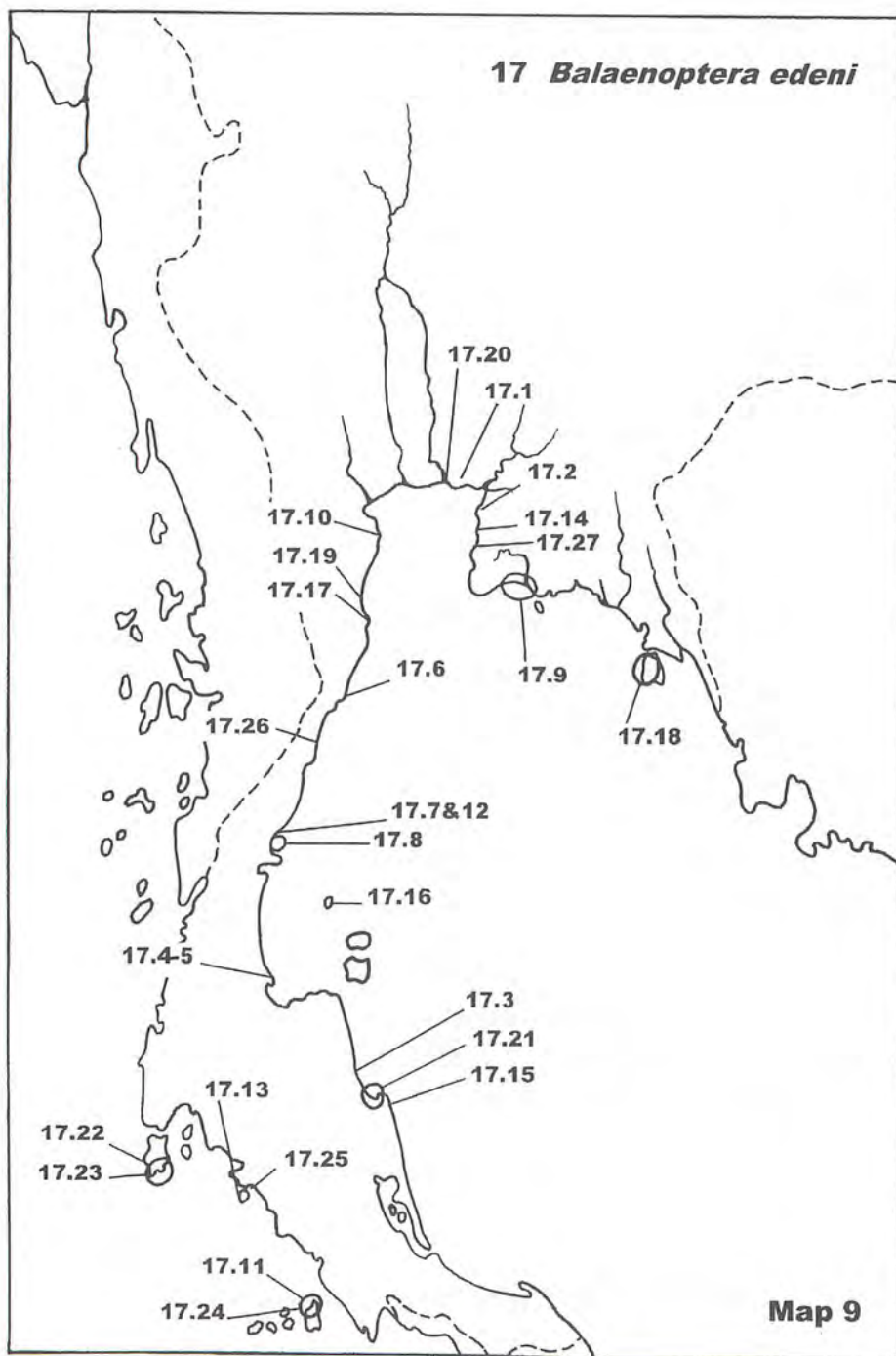
Records (see map 9)

- 17.1. Subfossil 1500–2500 YBP. Ban Na, Bangkok. Skeleton. NHMCU. Labeled *B. borealis*. ANDERSEN & KINZE (in prep.).
- 17.2. Subfossil. Bang Saen, Chonburi Province. Incomplete skeleton and one mandible at BIMS. ANDERSEN & KINZE (in prep.).
- 17.3. November 1909. Tha Sala, Nakorn Sri Thammarat Province. Skeleton at Wat Phra Mahathat. Sex not known. Listed as a minke whale by LEKAGUL & MCNEELY 1977. ANDERSEN & KINZE (in prep.). Fig. 4.
- 17.4. 1917. Chaiya, Ao Ban Don. Photograph of skull. Sex and TL not known. British Museum (Natural History). LEATHERWOOD (1986).
- 17.5. 1919. Khanthuli, Chumphon Province. Sex and TL not known. BURKIL (1935). CHASEN (1940), GIBSON-HILL (1949, 1950) and LEKAGUL & MCNEELY refer to this record as *B. borealis*. ANDERSEN & KINZE (in prep.).
- 17.6. 1963. Khlong Wal, Prachuap Khirikhan Province. Mandibles. Sex and TL not known. The Brackish water Fisheries Center, PPK. ANDERSEN & KINZE (in prep.).
- 17.7. 2 April 1964. Bo Mao Bay, Pathio, Chumphon Province. Skeleton. Sex not known. Reported length 10 m. KUMF. SUWATTI (1966). THIEMMEDH (1968). PILLERI (1973). Listed by LEKAGUL & MCNEELY (1977) as minke whale. ANDERSEN & KINZE (in prep.).
- 17.8. 1969. Chumphon. Skeleton. Sex not known. Reported length 12 m. OFD.
- 17.9. 1973. Rayong Province. Skeleton. Sex and TL not known. The Department of Aquatic Sciences, Burapha University. ANDERSEN & KINZE (in prep.).
- 17.10. 1973. Had Chao Samran. Phetburi province. Skeleton. Sex and TL not known. Wat Had Chao Samran (temple). ANDERSEN (unpublished).
- 17.11. 1973. Koh Tarutao. Satun Province. Skeleton. Sex and TL not known. The visitor center. Tarutao Marine National Park. ANDERSEN & KINZE (in prep.).
- 17.12. 1973. Pathio, Chumphon Province. Skeleton. Sex not known. Reported length 8 m. Wat Tham Khao Phlu (temple). ANDERSEN & KINZE (in prep.). Fig. 5.
- 17.13. 1975. Koh Lanta Yai, Krabi Province. Skeleton. Sex and TL not known. Café Museum Art Bar. ANDERSEN (unpublished).

- 17.14. 17 July 1975. Bang Saen Beach, Chonburi Province. Skeleton. Sex not known. Reported length 10 m. Skeleton at BIMS. ANDERSEN & KINZE (in prep.).
- 17.15. 9 July 1976. Si Chon, Nakorn Sri Thammarat Province. Skeleton. Sex and TL not known. Prasarnsuk Villa, ANDERSEN & KINZE (in prep.).
- 17.16. Before 1977. Koh Tao, Chumphon Province. Sex and TL not known. Listed by LEKAGUL & MCNEELY as minke whale. Reassigned by ANDERSEN & KINZE (in prep.) to *B. edeni*.
- 17.17. Before 1977. Sam Roi Yod, Prachuab Khirikhan Province. Sex and TL not known. Listed by LEKAGUL & MCNEELY as minke whale. Reassigned by ANDERSEN & KINZE (in prep.) to *B. edeni*.
- 17.18. Before 1977. Koh Si Chang, Trat Province. Sex and TL not known. Listed by LEKAGUL & MCNEELY as minke whale. Reassigned by ANDERSEN & KINZE (in prep.) to *B. edeni*.
- 17.19. April 1977. Hua Hin, Prachuab Khirikhan Province. Skeleton. Sex not known. Reported length 14 m. Pradiphat Army Camp. ANDERSEN & KINZE (in prep.).
- 17.20. 1981. Samut Prakarn Harbour, Samut Prakarn Province. Skeleton. Sex not known. Reported length 6.2 m. PMBC. ANDERSEN (unpublished).
- 17.21. 1982. Nakorn Sri Thammarat, Nakorn Sri Thammarat Province. Photograph. Sex and TL not known. NICA.
- 17.22. 15 September 1983. Sapam Bay, Phuket Province. Skeleton. Sex not known. 6.76 m. PMBC. ANDERSEN & KINZE (in prep.).
- 17.23. Before 1987. Phuket harbour. Phuket Province. Photograph of occipital part of skull in the files of ZMUC. Sex and TL not known.
- 17.24. 1987. Koh Tarutao, Satun Province. Specimen buried at Koh Tarutao. Sex and TL not known. Tentatively assigned to *B. edeni* by ANDERSEN & KINZE (in prep.).
- 17.25. December 1990. Koh Lanta Boh, Krabi Province. Mandibles. Sex and TL not known. Koh Lanta School. ANDERSEN (unpublished).
- 17.26. January-February 1993. Bang Saphan Noi, Prachuab Khirikhan Province. Skeleton. Male, reported length 12 m. Brackish Water Fisheries Center, Prachuab Khirikhan. ANDERSEN (unpublished).
- 17.27. 29 June 1993. Ban Bang Lamung, Chonburi Province. Skeleton. Sex not known, reported length 13 m. Wat Ban Bang Lamung (temple).

SPECIES TO BE EXPECTED IN THAI WATERS

Seventeen species of whales and dolphin have so far been recorded for Thai waters. In addition the identification key includes the following species that are known from



Map 9. Distribution of records for *B. edeni*.

adjacent waters: *Kogia breviceps* pygmy sperm whale (Vietnamese waters; SERÉNE, 1934), *Mesoplodon densirostris* Blainville's beaked whale (Philippine waters; DOLAR, 1994), *Ziphius cavirostris* Cuvier's beaked whale (Indonesian waters; DAMMERMAN, 1926), *Hyperoodon* sp. an undescribed species of bottlenosed whale (Indonesian waters; Smeenk, pers. comm.), *Grampus griseus* Risso's dolphin (Philippine waters; DOLAR, 1994), *Feresa attenuata* pygmy killer whale (Philippine waters; DOLAR, 1994), *Lagenodelphis hosei* Fraser's dolphin (Malaysian waters; JEFFERSON & LEATHERWOOD, 1994), *Balaenoptera acutorostrata* minke whale (Taiwanese waters; CHOU, 1994), *Balaenoptera borealis* Sei whale (Indonesian waters; FLOWER, 1864), *Balaenoptera physalus* fin whale (Indonesian waters; DAMMERMAN, 1938), *Balaenoptera musculus* blue whale (Vietnamese waters, Mae Khong estuary; Nguyen Khac Huong, pers. comm.), and *Megaptera novaeangliae* humpback whale (Malaysian waters; PAYNE ET AL., 1985).

IDENTIFICATION KEY

The key includes all species documented for Thai waters marked (D) or expected to occur in Thai waters marked (E). Common species are marked (C).

- 1 **A.** One blowhole, teeth usually present (fig. 6, 1A). Toothed whales.....**2**
 B. Two blowholes, baleens present but never teeth, with long pleats on the ventral surface extending from the snout (fig. 6, 1B). Rorquals, baleen whales.....**23**

- 2 **A.** Blowhole positioned at the tip of left side of the head (fig. 6, 2A), large animals up to 18 m with bulky heads 1/4 of total length (fig. 9).....
 sperm whale (D) *Physeter macrocephalus*
 B. Blowhole situated centrally on top of the head (fig. 6, 1A), small to medium sized animals, head never exceeding 1/5 of the total length.....**3**

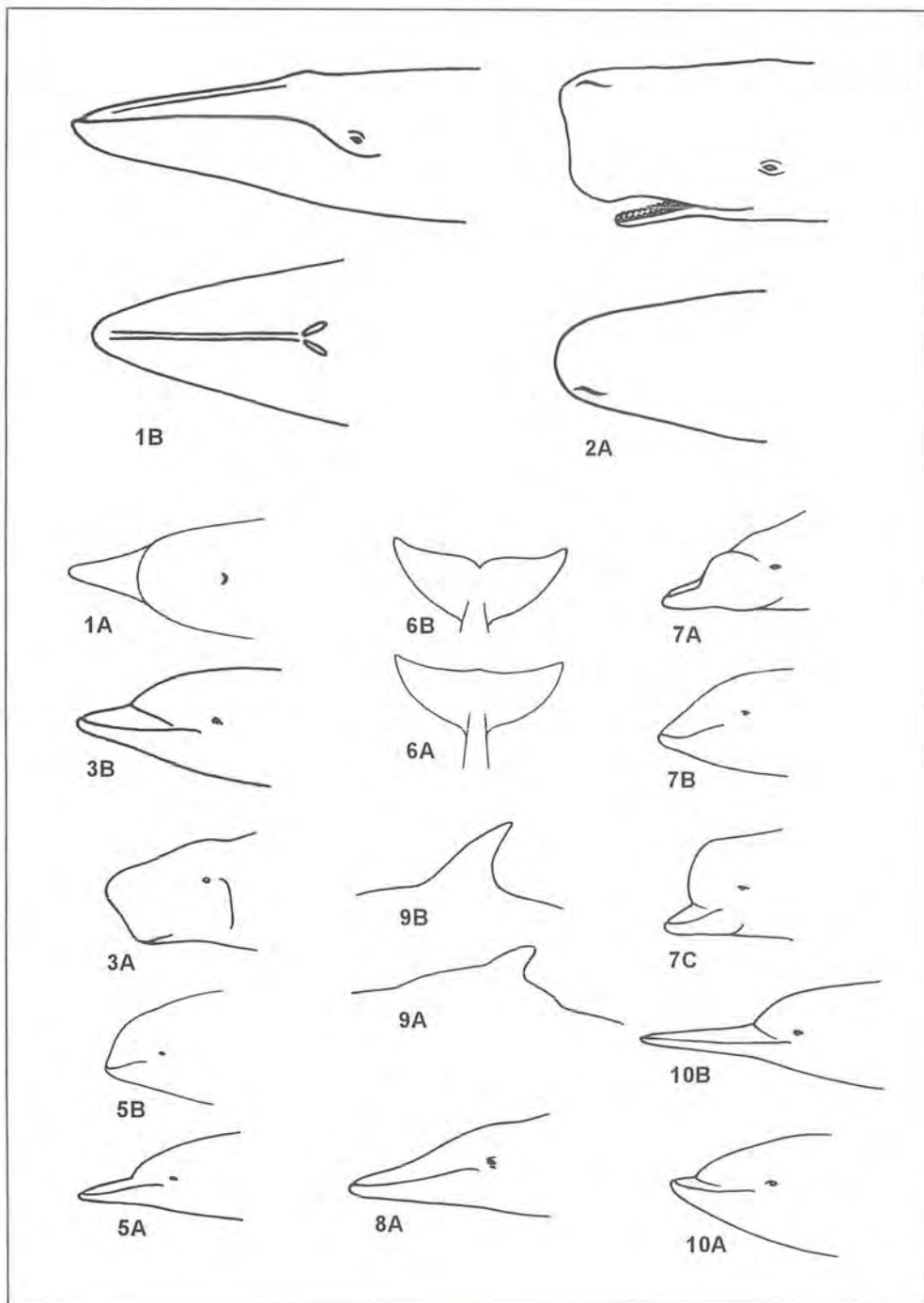
- 3 **A.** Upper jaw extends prominently over lower jaw, white bracket marks superficially resembling gill openings just behind the eyes (fig. 6, 3A). Dwarf and pygmy sperm whales.....**4**
 B. Upper and lower jaw about the same level or lower jaw slightly extending beyond upper jaw, no bracket marks (fig. 6, 3B).....**5**

- 4 **A.** Teeth present only in the lower jaw, small dorsal fin (less than 5% of the TL) posteriorly on back, length up to 3.4 m (fig. 10).....
 pygmy sperm whale (E) *Kogia breviceps*
 B. Teeth present in both lower and upper jaw, large dorsal fin (more than 5% of the TL) on the center of the back, length up to 2.7 m (fig. 11).....
 dwarf sperm whale (D) *Kogia simus*

- 5 **A.** Beak present (fig. 6, 5A).....**6**
 B. Beak absent (fig. 6, 5B).....**16**

- 6 **A.** Few teeth (1 or 2 pairs) or no visible teeth. Inconspicuous or no fluke notch (fig. 6, 6A), beaked whales.....7
 B. Many pairs of teeth (typically more than 15), fluke notch present (fig. 6, 6B).....8
- 7 Beaked whales belong to the least known cetaceans of the world. Females and juveniles often lack diagnostic external features, and can only be determined on osteological evidence. The species included here have been selected as the most likely to occur in the area, but because of the poor state of knowledge other species may occur as well. Beaked whales should if possible always be examined by a specialist and specimens should be secured. The following characters apply to adult males only.
- A.** Prominent beak. Gape highly curved (fig. 6, 7A), 2 flat teeth in the middle of the lower jaw. Genus *Mesoplodon*. Teeth are barely visible in the ginkgo-toothed beaked whale (D) *M. ginkgodens* (fig. 12) and clearly visible in Blainville's beaked whale (E) *M. densirostris*
 B. Inconspicuous beak. Gape not curved (fig. 6, 7B). 2 round teeth at the tip of the lower jaw. Head sometimes white.....Cuvier's beaked whale (E) *Ziphius cavirostris*
 C. Prominent beak and massive forehead. Gape not curved (fig. 6, 7C). 2 large and two smaller round teeth at the tip of the lower jaw,.....undescribed species of bottlenose whale (E) *Hyperoodon* sp.
- 8 **A.** No demarcation between beak and melon (fig. 6, 8A), teeth feel rough9
 B. Clear demarcation between beak and melon (fig. 6, 3B & 10A), teeth feel smooth.....10
- 9 **A.** Broadly based dorsal fin (fig. 6, 9A), 29–38 pairs of teeth in upper and lower jaw. Often of prominent pink color (fig. 13).....Indopacific humpback dolphin (D&C) *Sousa chinensis*
 B. Falcate dorsal fin (fig. 6, 9B) 20–27 pairs of teeth in upper and lower jaw. Back and flanks with clear contrast line between darker and lighter gray. Belly white (fig. 14).....rough-toothed dolphin (D) *Steno bredanensis*
- 10 **A.** Beak short or very short (fig. 6, 10A).....11
 B. Beak long (fig. 6, 10B).....12
- 11 **A.** Very short beak with 38–44 pairs of teeth in upper and lower jaw, broad stripe on the flanks (fig. 15).....Fraser's Dolphin (E) *Lagenodelphis hosei*
 B. 18–26 pairs of teeth in upper and lower jaw, no stripe on the flanks (fig. 16).....tropical bottlenosed dolphin (D&C) *Tursiops aduncus*

- 12 A. Usually more than 50 pairs of teeth in upper and lower jaw. Stripes running from eye to anus (fig. 7, 12A).....13
 B. Usually less than 50 pairs of teeth in upper and lower jaw. No stripes on the flanks.....15
- 13 A. Hourglass shaped criss-cross pattern (fig. 7, 13A) with yellow or olive patch (Genus *Delphinus*).....14
 B. Chevron on the flanks (fig. 7, 13B, fig. 17).....
striped dolphin (D) *Stenella coeruleoalba*
- 14 Two species of common dolphin are recognised. *Delphinus capensis* has a longer beak and more teeth and a more faint coloration than *Delphinus delphis* (fig. 18).
- 15 A. Size up to 2.4 m, 34-48 pairs of teeth. Faint spotting. Tip of snout white (fig. 19).....pantropical spotted dolphin *Stenella attenuata*
 B. Size never exceeding 1.6 m, 41-49 teeth. No spotting. Tip of snout sometimes black (fig. 20).....dwarf spinner dolphin (D) *Stenella longirostris*
- 16 A. Large animals with black and white coloration. Males with sword-like dorsal fin (fig. 7, 16A). 10-12 teeth in each half of upper and lower jaw (fig. 21).....
killer whale (D) *Orcinus orca*
 B. Small to medium sized animals with more or less uniform dark or black coloration 17
- 17 A. Head with very steep forehead (fig. 7, 17A) 18
 B. Flat forehead, head looks more pointed (fig. 7, 17B) 21
- 18 A. Small animals less than 1.8 m. No dorsal fin. Prominent area with tubercles on the back. Teeth spatulate (fig. 7, 18A, fig. 22).....
finless porpoise (D & C) *Neophocaena phocaenoides*
 B. Larger animals. Dorsal fin present. Teeth conical (fig. 7, 18B).....19
- 19 A. Forehead with crease (fig. 7, 19A). Few teeth (up to 8) only present in lower jaw (fig. 23).....Rissos dolphin (E) *Grampus griseus*
 B. Forehead without crease. At least 32 teeth in both jaws.....20
- 20 A. 7-9 pairs of teeth. Dorsal fin on the first third of the back, long pointed flippers (fig. 7, 20A, fig. 24).....pilot whale (D) *Globicephala macrorhynchus*
 B. 17-20 pairs of teeth. Dorsal fin slightly posterior the center of the back, relatively short flippers (fig. 25).....Irrawaddy dolphin (D&C) *Orcaella brevirostris*
- 21 A. Medium sized animals. Flipper with hump on leading edge (fig. 7, 21A, fig. 26)
false killer whale (D) *Pseudorca crassidens*
 B. Small animals never exceeding 2.7 m. Flipper without hump on leading edge.....22



Figures 6–8. Diagnostic characters used in the identification key.

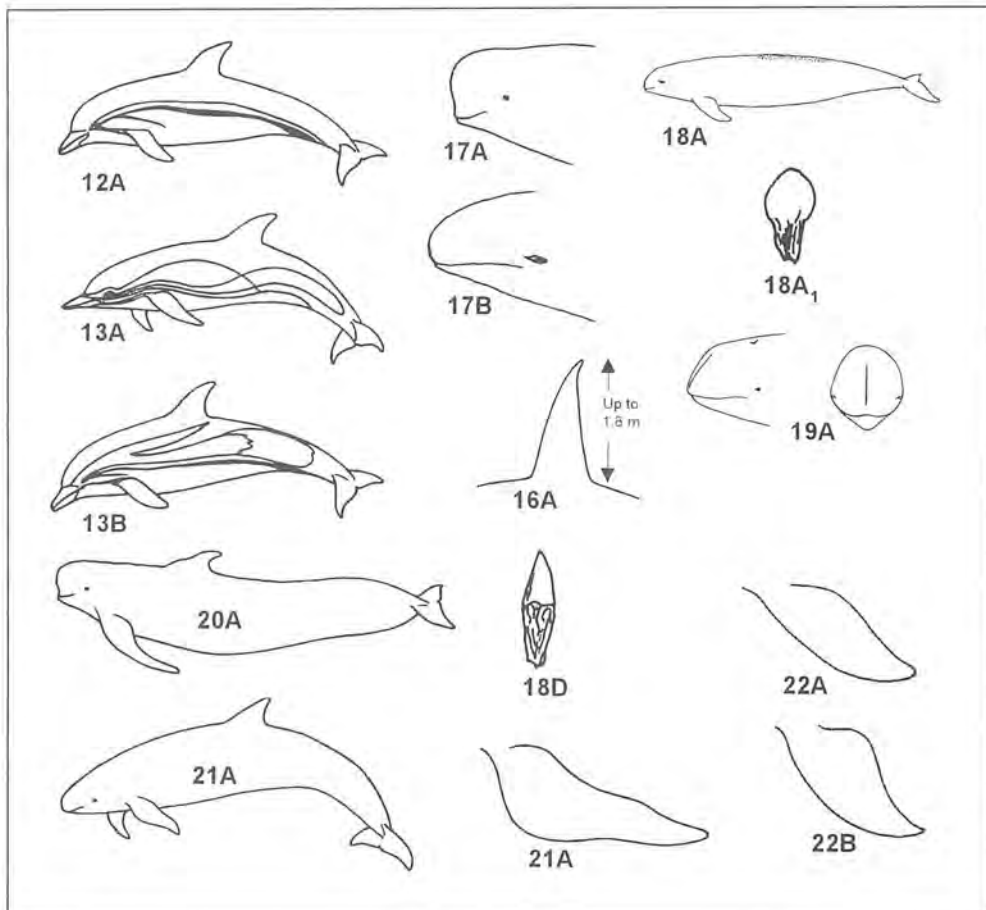


Figure 7.

- 22 A. 8–13 pairs of teeth in each jaw. Tip of flipper rounded (fig. 7, 22A, fig. 27)
pygmy killer whale *Feresa attenuata*
 B. 20–25 pairs of teeth in each jaw. Tip of flipper pointed (fig. 7, 22B, fig. 28),
melon-headed whale *Peponocephala electra*
- 23 Rorquals *Balaenopteridae*. So far the only documented extant baleen whale from Thailand is the Bryde's whale *Balaenoptera edeni*. The specimens examined have all been relatively small compared with the larger Japanese or South African samples of Bryde's whales. The authors therefore wish to keep the original vernacular name Sittang whale given by Anderson in 1878 for the type specimen representing the Southeast Asian animals.
- A. Very long flippers (up to 1/3 of the body length), head with bumps, dorsal fin with hump (fig. 8, 23A).....humpback whale *Megaptera novaeangliae*

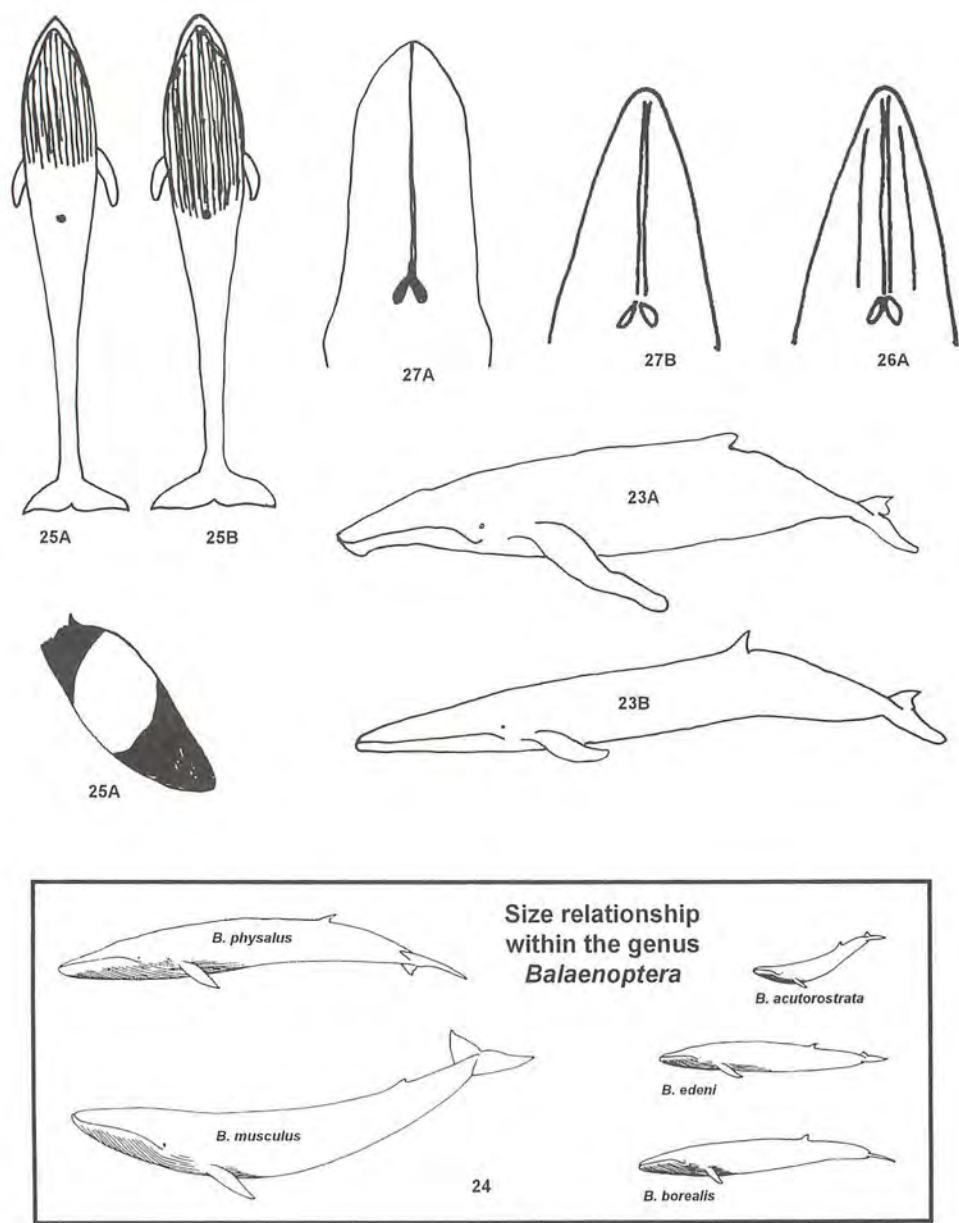


Figure 8.

- B. Flippers significantly shorter (1/7 of the body length or less), neither bumps nor humps present (fig. 8, 23B), Genus *Balaenoptera*.....24
- 24 Genus *Balaenoptera*, please refer to fig. 23 for size relationship within the genus.
 A. Ventral grooves end before navel (fig. 8, 25A).....25
 B. Ventral grooves end at or after navel (fig. 8, 25B).....26
- 25 A. Length up to 9 m. Baleens off-white. Head extremely pointed, flipper with white patch (fig. 8, 25A).....minke whale *B. acutorostrata*
 B. Length up to 16 m. Baleens black, head V shaped.....sei whale *B. borealis*
- 26 A. One central prominent ridge on top of the head and one smaller ridge lateral on each side (fig. 8, 26A), baleen brownish, bristles coarse and short (fig. 29)Sittang whale (D & C) *B. edeni*
 B. Only one prominent ridge (fig. 8, 27B).....27
- 27 A. Coloration on the head symmetrical and uniformly blue grey, very small dorsal fin (about 1% of total length), head U-shaped seen from above (fig. 8, 27A).....blue whale *B. musculus*
 B. Coloration of right side of the head asymmetrical. The lower lip, mouth cavity and the anterior baleen plates are white. Large dorsal fin, head V-shaped seen from above (fig. 8, 27B).....fin whale *B. physalus*

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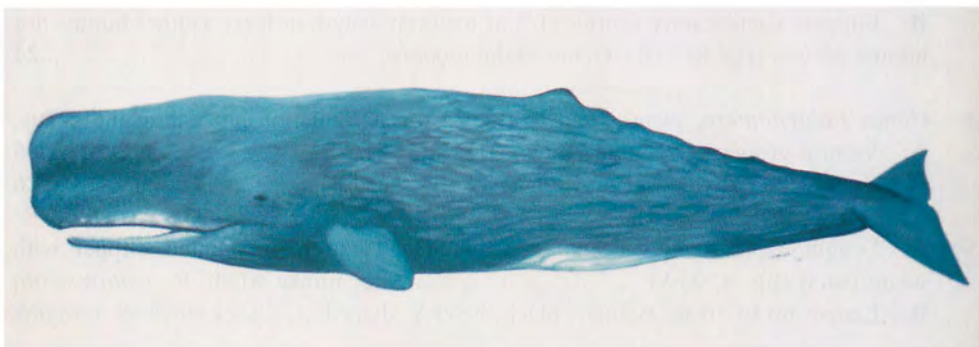


Figure 9. Sperm whale *Physeter macrocephalus*.

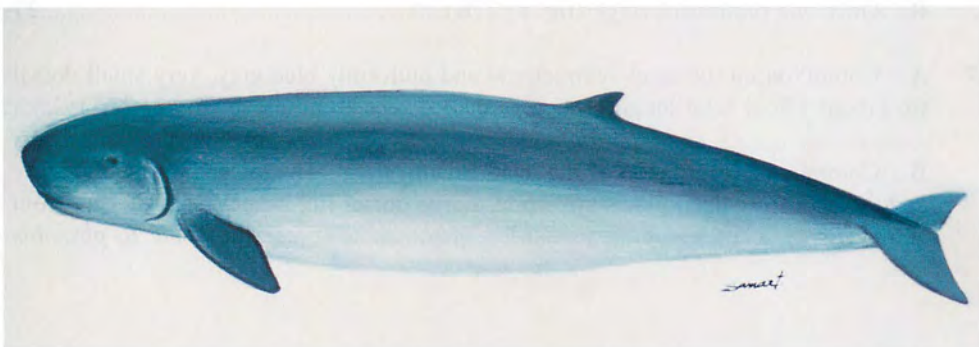


Figure 10. Pygmy sperm whale *Kogia breviceps*.

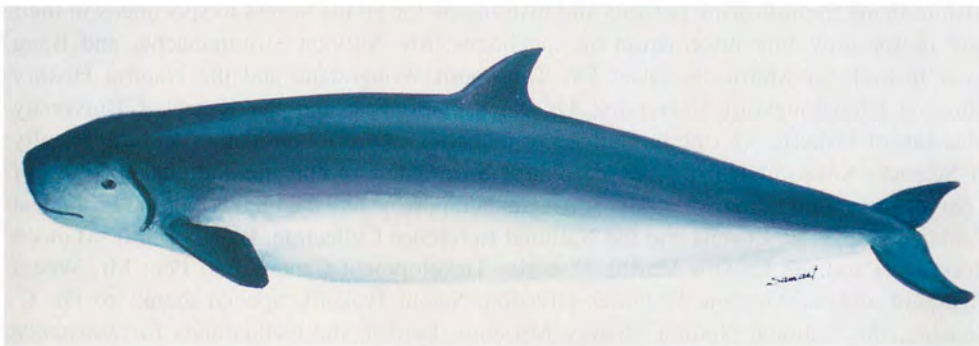


Figure 11. Dwarf sperm whale *Kogia simus*.



Figure 12. Ginkgo-toothed beaked whale *Mesoplodon ginkgodens*.

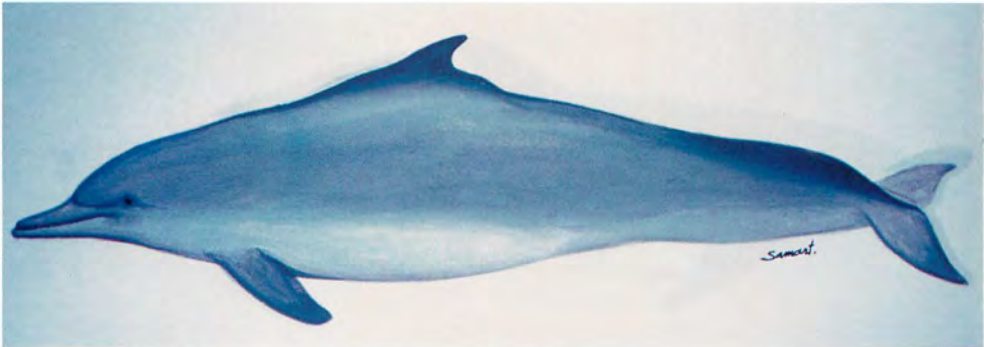


Figure 13. Indopacific humpback dolphin *Sousa chinensis*.



Figure 14. Rough toothed dolphin *Steno bredanensis*.

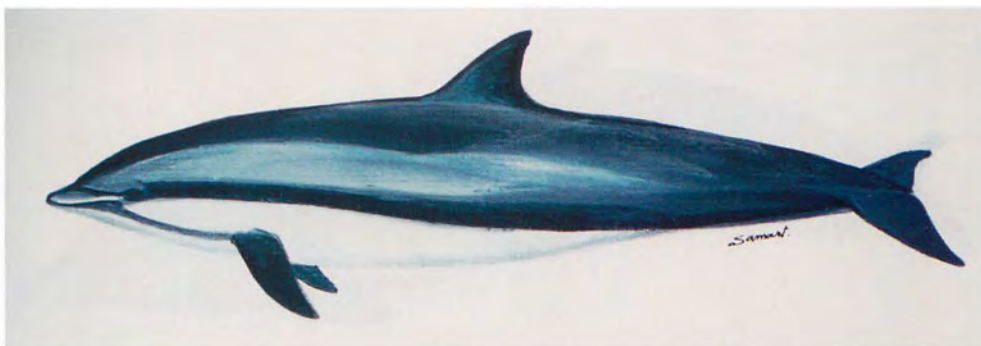


Figure 15. Fraser's dolphin *Lagenodelphis hosei*.

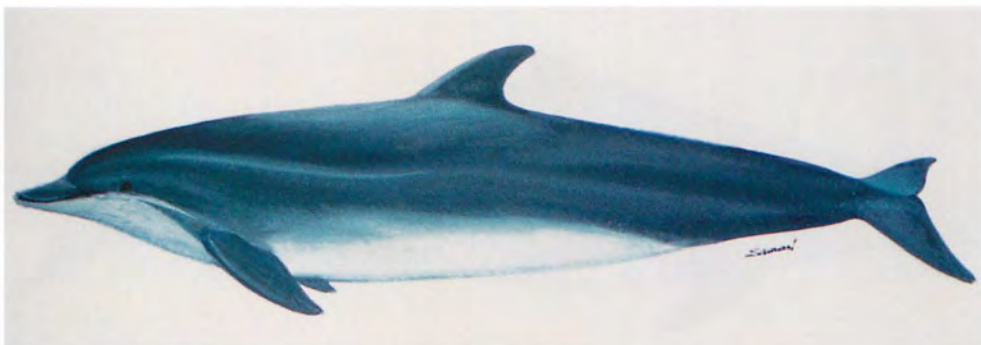


Figure 16. Tropical bottlenosed dolphin *Tursiops aduncus*.

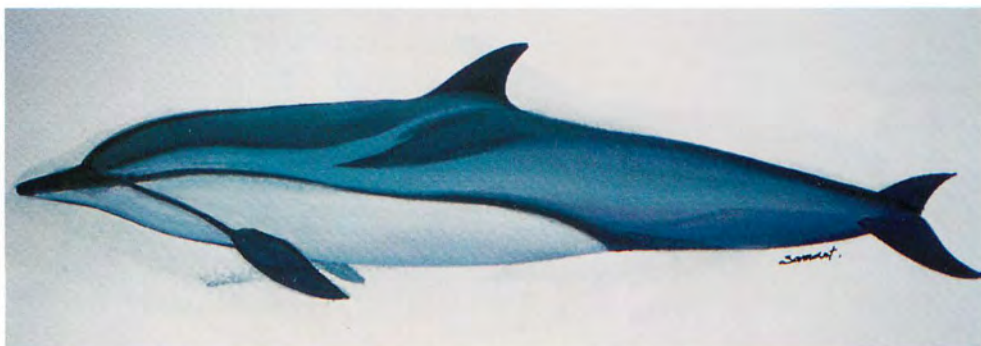


Figure 17. Striped dolphin *Stenella coeruleoalba*.



Figure 18. Long-beaked common dolphin *Delphinus capensis*.

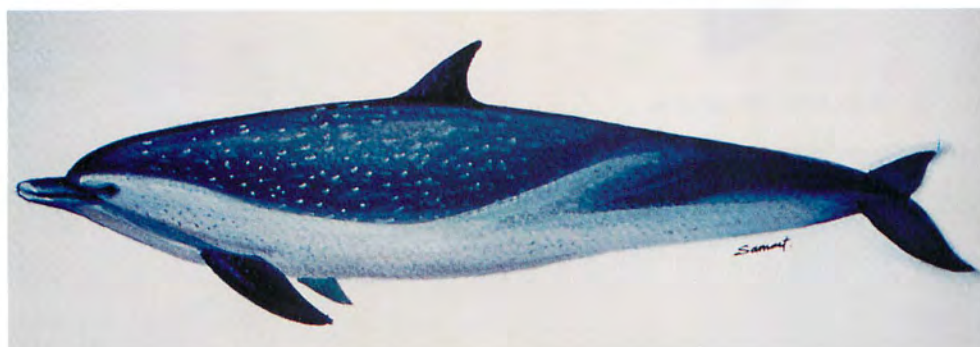


Figure 19. Pantropical spotted dolphin *Stenella attenuata*.



Figure 20. Dwarf spinner dolphin *Stenella longirostris*.

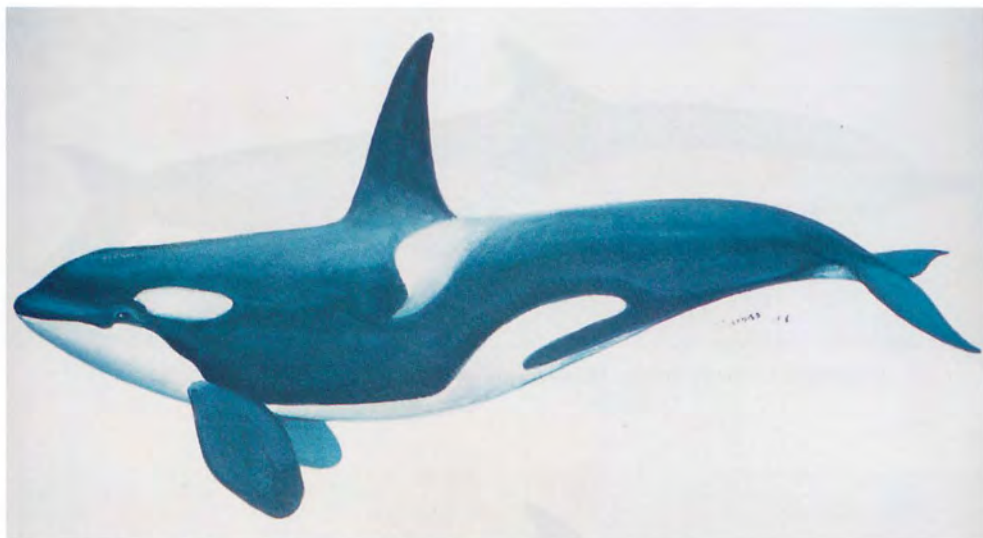


Figure 21. Killer whale *Orcinus orca*.

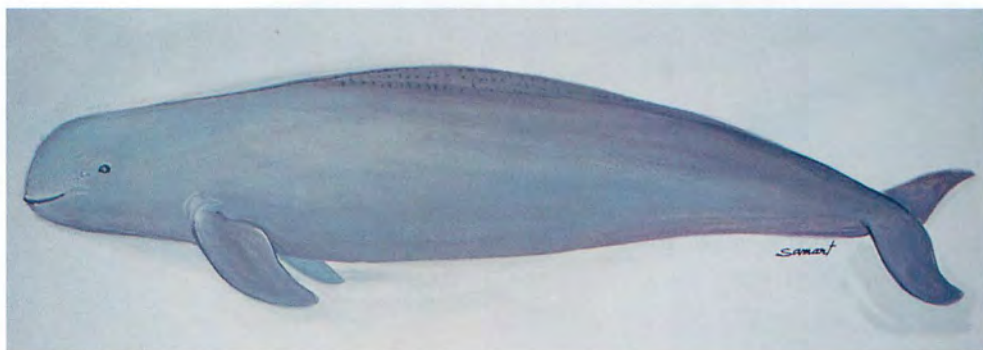


Figure 22. Finless porpoise *Neophocaena phocaenoides*.

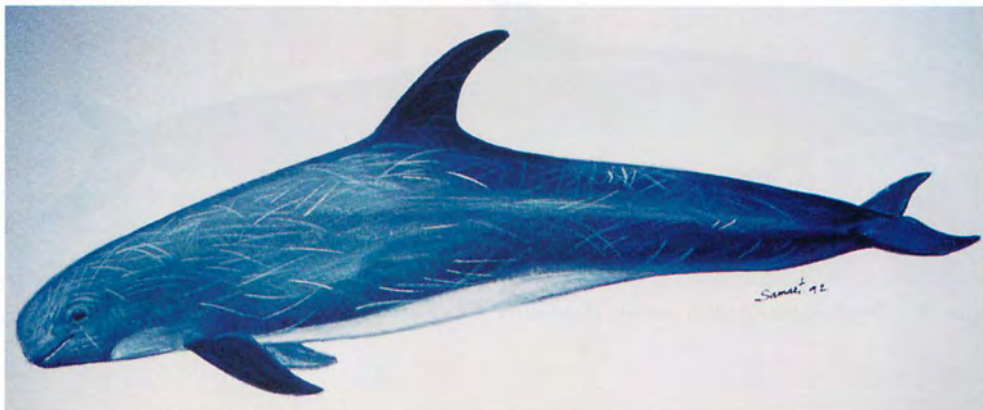


Figure 23. Risso's dolphin *Grampus griseus*.

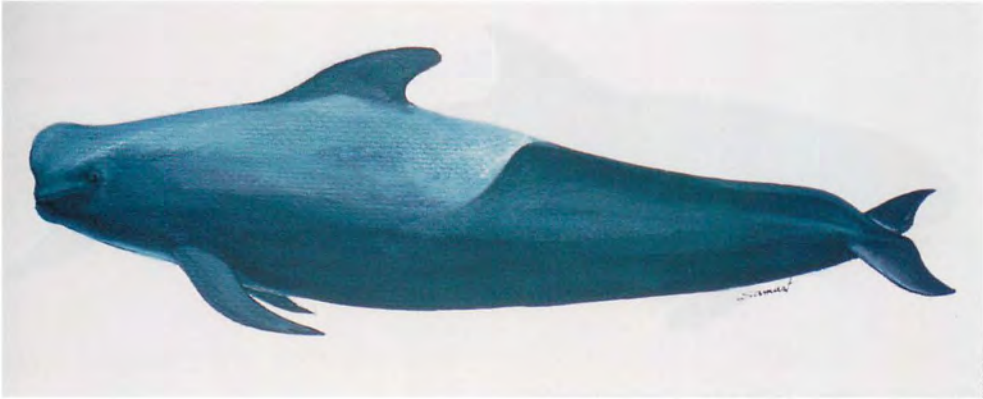


Figure 24. Pilot whale *Globicephala macrorhynchus*.

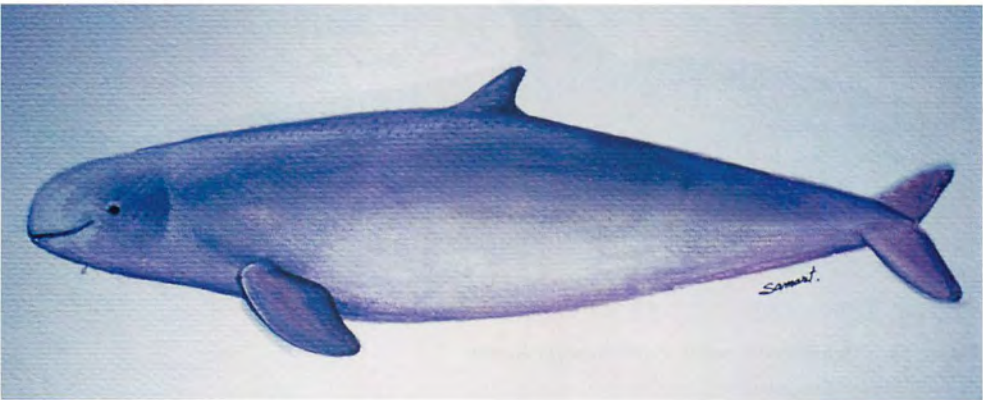


Figure 25. Irrawaddy dolphin *Orcaella brevirostris*

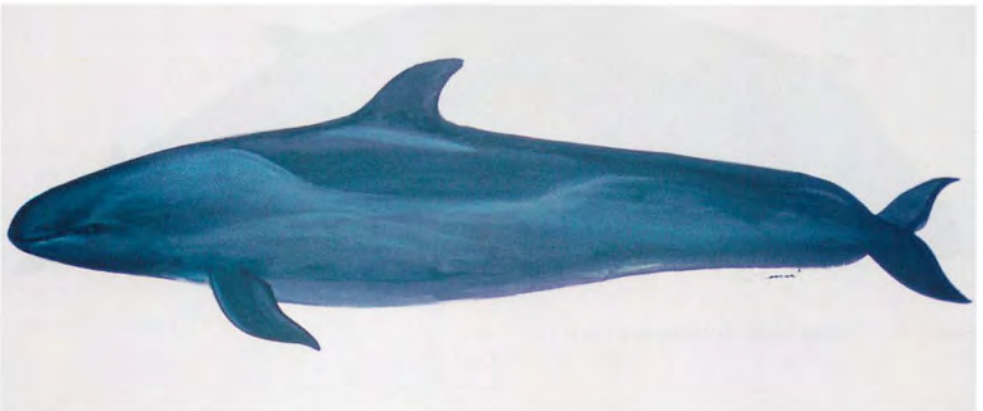


Figure 26. False killer whale *Pseudorca crassidens*.

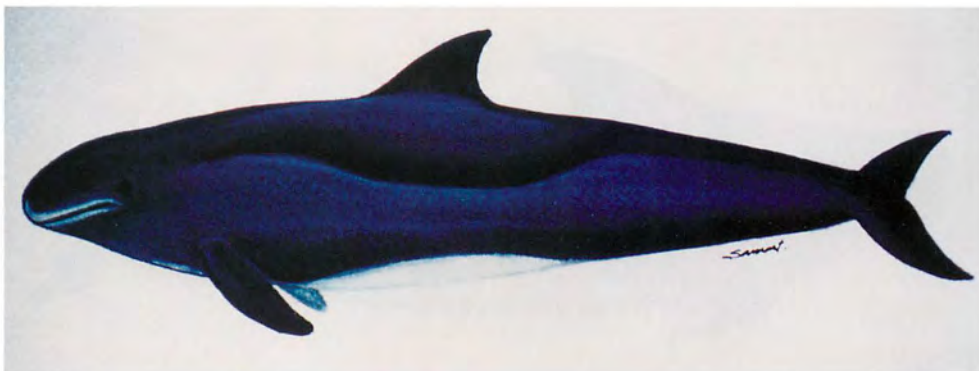


Figure 27. Pygmy killer whale *Feresa attenuata*.

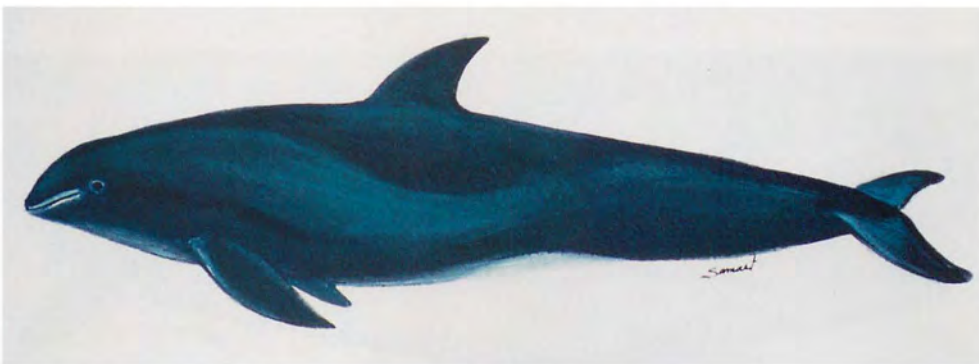


Figure 28. Melon-headed whale *Peponocephala electra*.



Figure 29. Sittang whale *Balaenoptera edeni*.

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