30. Marine Mammals

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INTRODUCTION

The Great Barrier Reef World Heritage Area supports a diverse marine mammal fauna. As listed in Table 30.1, our knowledge of their distributions suggests that more than 30 species of marine mammals spend at least part of their lives in the region. Almost all of these animals are members of the Order Cetacea (whales and dolphins). The region also supports globally significant populations of one member of the Order Sirenia (sea cows), the dugong, *Dugong dugon.* Both cetaceans and sirenians spend their entire lives in the water.

There are two major groups (suborders) of cetaceans, the Mysticeti or baleen whales and the Odontoceti or toothed whales. Baleen whales lack teeth and have baleen plates hanging from roof of their mouths. Toothed whales generally capture their prey, typically fish or squid, one at a time. Their most usual dentition is a large number (up to 100) of peg-like teeth, all similar in form in each of the upper and lower jaws.

Each cetacean suborder contains several families, which in turn contain one or more genera. Two baleen whales, the humpback, *Megaptera novaengliae,* and the dwarf minke, *Balaenoptera acutorostrata,* are commonly seen in the GBR region during the winter and are important tourist attractions. The coastal odontocetes include the rare Indo-Pacific hump-backed dolphins, *Sousa chinensis* (Fig. 30.1), and Australian snubfin dolphins, *Orcaella heinsohni* (Fig. 30.2) (the only cetacean endemic to Australia and Papua New Guinea waters).

Some species such as killer whales and common dolphins are known to occur in the GBR region but are rarely reported. Other species have never been seen alive in the region but are known from strandings on the adjacent Queensland coast. One species, Longman's beaked whale, *Indopacetus pacificus,* was considered to be the world's rarest cetacean until recently. A skull found in Mackay, Queensland, was the basis for the initial description of this species.

The dugong is of great cultural and dietary value to indigenous Australians living adjacent to the GBR region. The importance of the populations of dugongs occurring in the GBR were part of the rationale for the region's World Heritage Listing.

IDENTIFYING MARINE MAMMALS

Identifying marine mammals at sea is extremely difficult, especially if only a small portion of an animal's body is seen fleetingly as it surfaces to breathe. High-quality photographs of an animal breaching (leaping from the water) or underwater with most or all of the body in the picture, or of stranded animals (alive or dead) are an important aid to identification and can be used by researchers

Table 30.1 List of marine mammals that are known or considered likely to occur in the Great Barrier Reef region from GBRMPA (2000). Generic distributional data from Bryden *et al*. (1998) and Steve Van Dyck, Queensland Museum.

Scientific name	Common name	Relevant generic habitat requirements	Known habitats in the Great Barrier Reef region
Order Cetacea, Suborder Mysticeti, Baleen whales			
Balaenoptera acutorostrata	Dwarf minke whale*	Probably throughout region in winter	Swain Reefs to Cape Grenville; especially between Lizard Island and Ribbon Reef No. 10, between March and October, particularly June–July. See Fig. 30.3*C*
Balaenoptera bonearensis	Antarctic minke whale*	Possibly throughout region in winter	More likely in south of region; most northerly sighting inside Ribbon Reef No. 5 but much less common in north than dwarf minke.
Balaenoptera edeni	Bryde's whale**	Throughout region all year; may be seen close to coast	
Balaenoptera musculus	Blue whale*	Oceanic possibly throughout region in winter	See Fig. 30.3*A*
Balaenoptera physalus	Fin whale	Oceanic; possibly in southern parts of region in winter	See Fig. 30.3*A*
Megaptera novaeangliae	Humpback whale*	Coastal and island waters in winter and spring; breeding grounds between about 15° and 20°S	Especially Whitsunday and Mackay regions in winter; seen at northern end of the Great Barrier Reef (10°30'S) between October and January, possibly all year. See Fig. 30.3*A*
Order Cetacea, Suborder Odontoceti Toothed Whales and Dolphins			
Delphinus delphis	Short-beaked common dolphin**	Pelagic and neritic waters throughout region	See Fig. 30.3*D*
Feresa attenuata	Pygmy killer whale**	Possibly throughout region	See Fig. 30.3*B*
Globicephala macrorhynchus	Short-finned pilot whale*	Possibly throughout region in open ocean and continental shelf waters	See Fig. 30.3*C*
Grampus griseus	Risso's dolphin*	Possibly throughout region both inshore and offshore	
Indopacetus pacificus	Longman's beaked whale*	Possibly beyond continental shelf throughout region	Confirmed standing in Mackay region

(continued)

Table 30.1 *(continued)*

Scientific name	Common name	Relevant generic habitat requirements	Known habitats in the Great Barrier Reef region
Order Cetacea, Suborder Odontoceti Toothed Whales and Dolphins			
Kogia breviceps	Pygmy sperm whale**	Possibly throughout region in oceanic waters	
Kogia sima	Dwarf sperm whale	Possibly throughout region	
Lagenodelphis hosei	Fraser's dolphin**	Throughout region in pelagic waters	See Fig. 30.3*D*
Mesoplodon densirostris	Blainville's beaked (or dense-beaked) whale*	Possibly throughout region	
Mesoplodon layardii	Strap-toothed (or Layard's) beaked whale*	Possibly throughout region, south of Cooktown	
Orcaella heinsohni	Australian snubfin dolphin*	Inshore waters throughout region	Waters <15 m deep within 10 km of the coast and 20 km from the nearest river mouth; tend to be closer to river mouths than humpback dolphins. See Fig. 30.3*B*
Orcinus orca	Killer whale (or orca)+	Throughout region	Reported from Raine Island region in turtle nesting season. See Fig. 30.3*C*
Peponocephala electra	Melon-headed whale*	Possibly throughout region	Recorded in inshore and offshore waters between about Cooktown and Mackay. See Fig. 30.3*B*
Physeter macrocephalus	Sperm whale*	Deep water >200 m near continental shelf	Seen inside reef in northern GBR, about 12°30′ in November. See Fig. 30.3*A*
Pseudorca crassidens	False killer whale*	Probably throughout region	See Fig. 30.3*C*
Sousa chinensis	Indo-Pacific humpbacked dolphin*	Inshore waters throughout region	Mostly in waters <15 m deep within 10 km of the coast and 20 km from the nearest river mouth. See Fig. 30.3*D*
Stenella attenuata	Pantropical spotted dolphin**	Possibly throughout region	
Stenella coeruleoalba	Striped dolphin**	Throughout region, pelagic usually deep water, subadults may come closer to coast	See Fig. 30.3*D*

Table 30.1 *(continued)*

Scientific name	Common name	Relevant generic habitat requirements	Known habitats in the Great Barrier Reef region
Stenella longirostris	Spinner dolphin*	Throughout region, primarily pelagic but nearshore in some regions particularly around islands	See Fig. 30.3*D*
Steno bredanensis	Rough-toothed dolphin	Possibly throughout region, usually far offshore	See Fig. 30.3*D*
Tursiops spp.	Bottlenose dolphin*	Widely distributed in both coastal (*T. aduncus*) and pelagic waters (generally *T. truncatus*)	Seen in coastal waters particularly near rocky headlands and offshore waters. See Fig. 30.3*D*
Ziphius cavirostris	Cuvier's beaked whale*	Possibly throughout region	
Order Sirenia, Family Dugongidae, sea cows			
Dugong dugon	Dugong*	Coastal and island waters throughout region, especially seagrass meadows	Especially in protected bays, offshore in northern GBR region in summer. See Fig. 30.3*B*

*confirmed from GBR region from strandings;
⁺confirmed for GBR region from sightings only;
**confirmed from Queensland south of GBR from strandings; Long-fined pilot whale *Globicephala melas* and Sei whale *Balaenoptera borealis* also confirmed from South-East Queensland from strandings.

to identify species and even individuals of some species. Sketches are also helpful.

Identifying stranded animals is also difficult, especially when they are decomposing and external features are used. However, if the skull is prepared, identification is much more certain. Stranded marine mammals in the GBR region should be reported through the stranding hotline at 1300 130 372.

An untrained observer is unlikely to be able to identify other than the most common and distinctive species of dolphins and whales. Beaked whales are particularly challenging because many species are rare and there are few reference specimens. Some species have been observed only as dead and rotting carcasses, so that the real appearance of the living animal is not known. Certain features, if observed and recorded carefully, are most helpful in species identification, when one has access to reference books or the opinion of experienced observers.

The observations that are most likely to be helpful in identifying a marine mammal at sea are:

(1) length of the animal;

(2) colour, including especially colour pattern (if any) and other markings or scars;

(3) presence or absence of a dorsal fin;

(4) if present, the size, shape and position relative to the distance between snout and tail flukes of the dorsal fin;

(5) the shape of the head (e.g. broad or narrow, square, round, bulbous or flat, beaked or snub-nosed);

(6) shape and height of the 'blow' (the cloud of vapour from the blowhole as the animal breathes out);

(7) observed behaviour (such as frequency of surfacing, how much of the back is seen when the animal surfaces, leaping, spinning in the air, slapping the water surface);

(8) the estimated number and composition of a group (e.g. are adults, calves or juveniles present, are all about the same size?)

Figure 30.3 is a sighting sheet that will help identify the species of marine mammals most likely to be seen in the GBR region; the species listed are not exhaustive. There are several good identification guides that provide more detail (see Additional reading).

There is still much to learn about cetacean distribution and the reported distribution maps for some species are probably inaccurate. A single report, or a small number of reports, of stranded individuals does not necessarily reflect the normal distribution and range of a species.

Some of the more well known marine mammals of the GBR region are introduced briefly below.

Humpback whale

The humpback whales that are born in, and migrate along, waters off the east coast of Australia form part of the Group E breeding stock. These whales generally feed in Area V in Antarctica and migrate along the eastern Australian coast to the GBR to mate and give birth. This population was severely depleted to a few hundred individuals or less by commercial whaling operations in the 20th century, but has increased rapidly since then. The most recent population estimate (for 2004) is around 7000 animals with a long term rate of increase of between 10–11% annually.

Information about humpback whales on their breeding grounds in the GBR is limited and mostly predates the recent increase in population size. The areas of highest concentrations of humpback whales, and in particular mothers with calves, seem to be around the Whitsunday Islands and the Mackay region but animals with calves are seen at least as far north as Cairns. Whaling records suggest that some humpbacks breed in the reefs to the east of the Coral Sea such as the Chesterfields. Humpbacks have also been sighted in the northern end of the GBR (10°31'S) between October and January, after the end of the main north-south migration. The significance of such sightings is unknown.

Humpback whales are distinguished by their very long flippers that may extend up to a third of their body length. The head, jaws and flippers bear a series of protuberances, the dermal tubercles, which give these parts of the animal a knobbly appearance. The small dorsal fin varies in shape from falcate to slightly rounded. The head is rounder than in the other baleen whales occurring in the GBR region and the general body somewhat stouter. The roundish blow rises to 2–3 m. Humpbacks are often active at the surface and spectacular behaviours such as flipper and tail slaps, spy-hopping and breaching are common.

Dwarf minke whale

Although the dwarf minke whale is known only from the southern hemisphere, it seems more closely related to the northern hemisphere minke whale, *Balaenoptera acutorostrata*, than to the Antarctic minke whale, *Balaenoptera bonaerensis*. It is currently regarded as an un-named subspecies of *B. acutorostrata,* but may be a distinct species. Both Antarctic and dwarf minke whales are found in GBR waters but only one Antarctic minke has been observed over the continental shelf in the northern region. The two species can be distinguished by their size and colouration: (1) female dwarf minkes have a maximum size of about 7.8 m, on average about 2 m shorter than Antarctic minkes, and (2) dwarf minkes have a white shoulder blaze and flipper base, with a dark grey tip on the flipper, in contrast to Antarctic minkes that have a light to dark grey shoulder and a uniformly paler grey flipper.

In the GBR region, dwarf minkes have been recorded from north of Cape Grenville Island to the Swain reefs. This distribution may reflect the pattern of human use of the region rather than the actual distribution of the whales. Dwarf minke whales are seen in the northern GBR between March and November, with over 90% of sightings in June and July. The outer shelf region from Ribbon Reef 10 (near Lizard Island) south along the Ribbon Reefs to Agincourt Reef is the main focus for minke whale tourism. People are allowed to swim with minke whales from permitted vessels in the Great Barrier Reef Marine Park, but only if the whales initiate the encounter. Regulations govern people's behaviour during such encounters. The colour patterns of dwarf minke whales are the most

Figure 30.1 Indo-Pacific humpback dolphin, *Sousa chinensis*. (Photo: G. Parra.)

Figure 30.2 Australian Snubfin dolphin, *Orcaella heinsohni*. (Photo: G. Parra.)

complex of any baleen whale and are used to identify individuals by researchers, with particular whales being sighted repeatedly over periods of up to eight years.

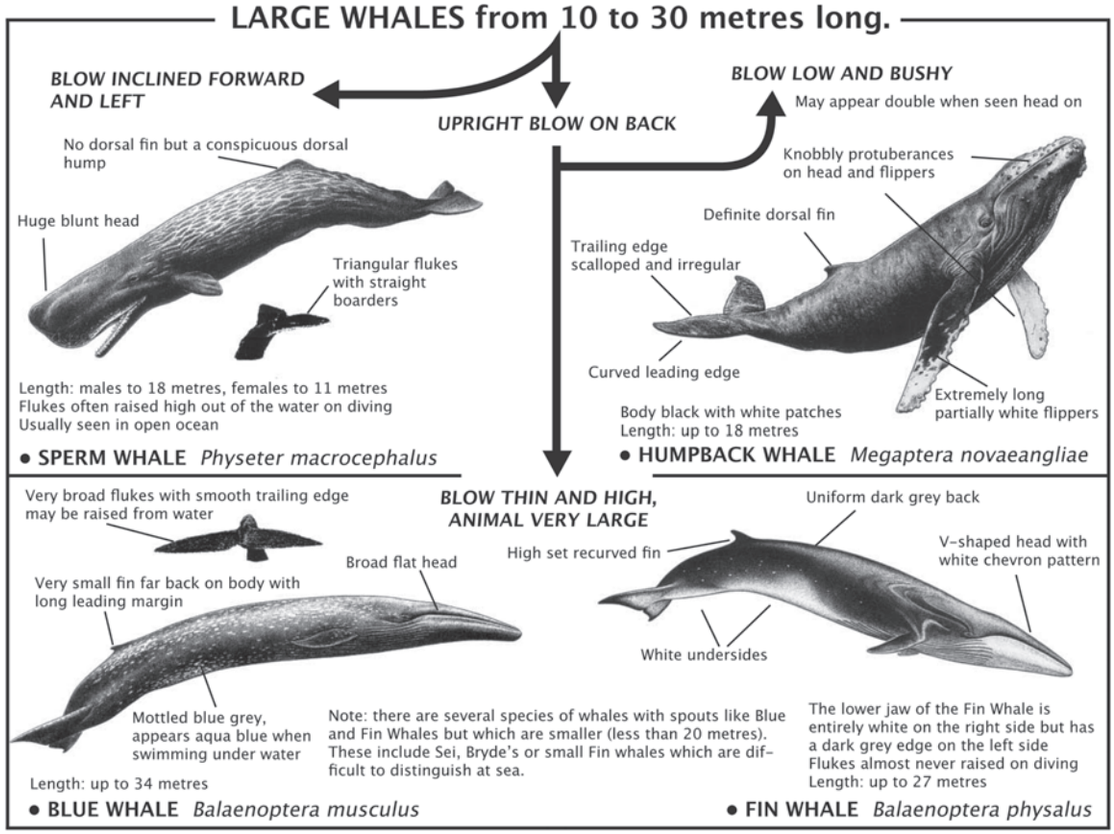
Coastal dolphins

Several species of coastal dolphins occur in the GBR region. Bottlenose dolphins *Tursiops* spp. occur in both coastal and pelagic waters in the GBR region. The Indo-Pacific humpback dolphin, *Sousa chinensis* (Fig. 30.1), and the Australian snubfin dolphin, *Orcaella heinsohni*, occur in small populations mainly close to the coast and estuaries.

Recent morphological and genetic studies of the genus *Orcaella* have revealed that Australian snubfin dolphins populations (Fig. 30.2) are a separate species from the Asian *O. brevirostris*. The species level taxonomy of humpback dolphins is unresolved and the humpback dolphins that occur in northern Australia are likely to join the Australian snubfin dolphin as the only cetaceans endemic to Australian waters. Thus, both species have extremely high biodiversity value at a national and international level. However, comprehensive research on these species in Australia has only been undertaken in Queensland, particularly in Cleveland Bay near Townsville.

The species are best distinguished by: (1) the shape of their head: the Australian snubfin dolphin lacks the beak characteristic of bottlenose and humpback dolphins, and the humpback dolphin has a longer and more defined beak than the bottlenose dolphin; (2) the shape of the dorsal fin: high and hooked in bottlenose dolphins, low and triangular in the humpback dolphin and small and triangular in the snubfin dolphin; (3) location: snubfin and humpback dolphins are likely to be in waters less than 10 m deep and up to 6 km offshore (sightings of humpback dolphins up to some 50+ km from the coast have been recorded in the northern GBR region, probably due to the physiography of the coastlines and continental shelves in this area), bottlenose dolphins occur in more open water or close to rocky headlands, (4) colouration: snubfin dolphins vary from different tones of pale grey to brownish grey; humpback dolphins are uniformly grey, with flanks shading to off-white and spotting towards the ventral surface; in some animals the dorsal fin, rostrum and melon whiten with age, while the rest of the dorsal surface remains pale grey; bottlenose dolphins are mainly dark grey (but mature individual of the *aduncus* form is spotted ventrally), and (5) school size: snubfin dolphins are mainly found in schools of 5–8 individuals (schools of one to 21 individuals have been observed in the wild), humpback dolphins form smaller schools of usually 2–3 individuals (school size ranges from one to 12 individuals); Bottlenose dolphins occur in schools of various sizes ranging from single animals to several individuals (>20).

A



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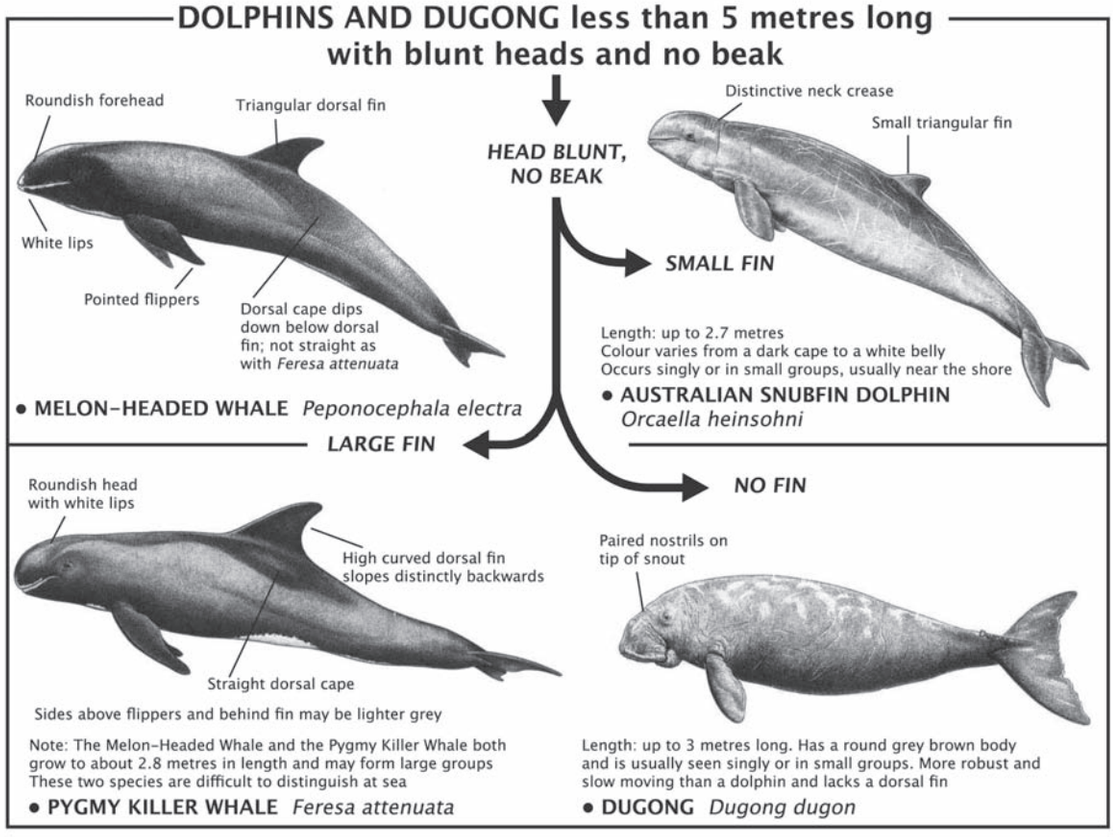

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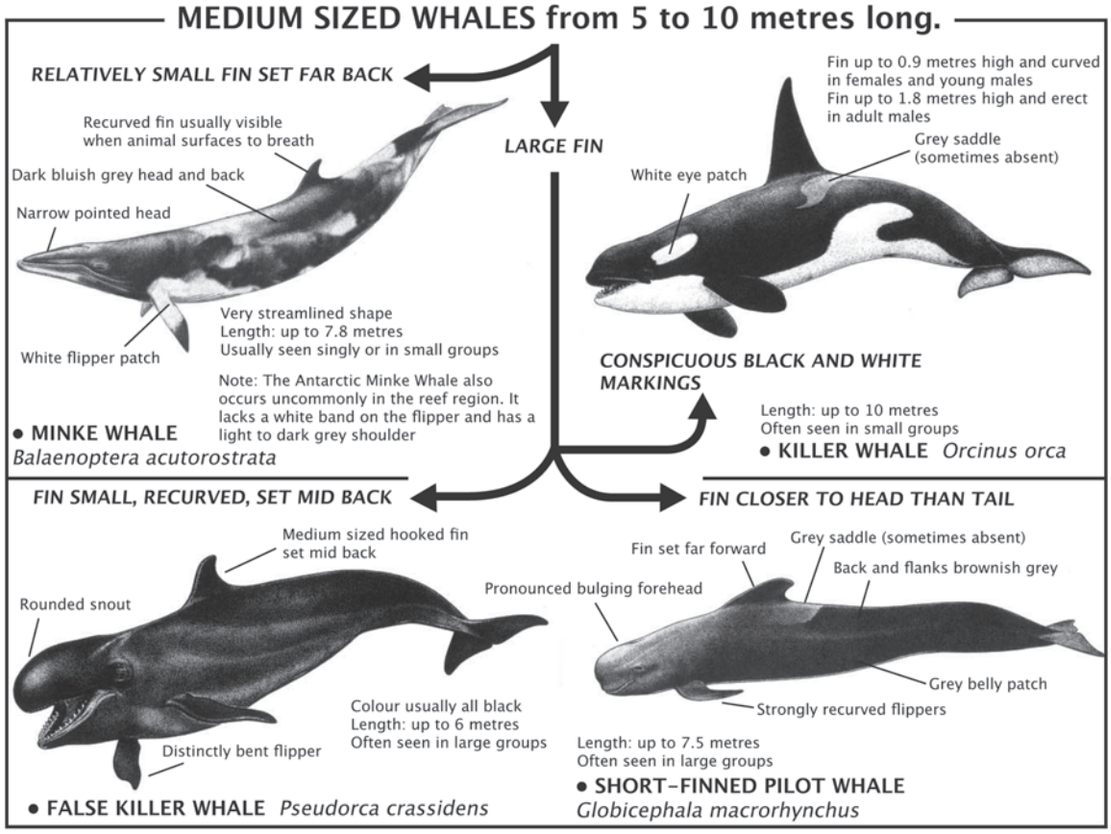

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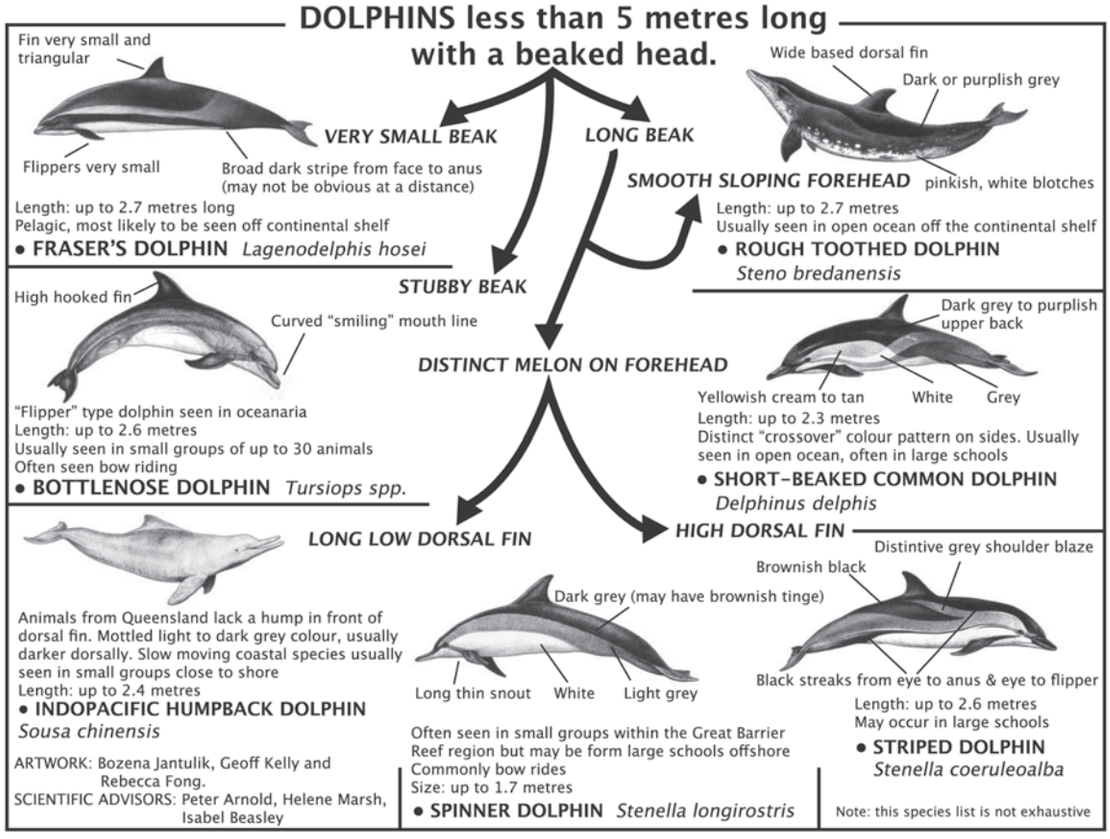

Figure 30.3
A–D, Identification guide to the marine mammals most likely to the seen in the Great Barrier Reef region. Not all animals from the region are illustrated. Table 30.1 provides a more complete list. (Figure: Bozena Jantulik, Geoff Kelly and Rebecca Fong.)

Dugong

The dugong (*Dugong dugon*) looks rather like a cross between a rotund dolphin and a walrus. Its body, flippers and fluke resemble those of a dolphin without a dorsal fin. Its head looks somewhat like that of a walrus without the long tusks. Growing to a length of up to about 3 m, the dugong is the only extant plant-eating mammal that spends all its life in the sea. Dugongs can be difficult to distinguish from Australian snubfin dolphins in the wild, especially as both species often occur in inshore turbid waters. Dugongs surface very discreetly, often with only their nostrils showing above the water. Dugongs tend to move more slowly than dolphins and the lack of a dorsal fin is their most distinguishing characteristic for observers at sea.

Adults are grey in colour but may appear brown from the air or from a boat. Older 'scarback' individuals may have a large area of unpigmented skin on the back above the pectoral fins. The dugong's head is distinctive with the mouth opening ventrally beneath a broad, flat muzzle. The tusks of mature males and some old females erupt on either side of the head. There are two mammary glands, each opening via a single teat situated in the 'armpit' or axilla. The mammaries are somewhat reminiscent of the breasts of human females, which probably explains the legendary links between mermaids and sirenians. The tail of the dugong is triangular like that of a whale.

The dugong mainly occurs in the coastal waters of the GBR lagoon where its distribution is broadly coincident with that of its seagrass food. It is seen up to about 100 km offshore inside the reef in the northern GBR region in the summer.

ADDITIONAL READING

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