Australian Government
Great Barrier Reef
Marine Park Authority

Published August 2004

Environmental Status:

Marine mammals

ISBN 1 876945 34 6

Published August 2004 by the Great Barrier Reef Marine Park Authority

National Library of Australia Cataloguing-in-Publication data:

Bibliography.
ISBN 1 876945 34 6

1. Conservation of natural resources – Queensland – Great Barrier Reef. 2. Marine parks and reserves – Queensland – Great Barrier Reef. 3. Environmental management – Queensland – Great Barrier Reef. 4. Great Barrier Reef (Qld). I. Great Barrier Reef Marine Park Authority

551.42409943

Chapter name: **Marine mammals**
Section: ***Environmental Status***
Last updated: August 2004
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This webpage should be referenced as:
Dobbs, K., Pierce, S. & Stokes, T. August 2004, 'Marine Mammals' in Chin. A, (ed) *The State of the Great Barrier Reef On-line*, Great Barrier Reef Marine Park Authority, Townsville. Viewed on (enter date viewed), http://www.gbrmpa.gov.au/publications/sort/marine_mammals/index.html

Marine Mammals

The marine mammals of the Great Barrier Reef include dugongs, whales and dolphins. This chapter is divided into two sections, the first concerning dugongs and the second cetaceans (whales, dolphins and porpoises).

Dugongs

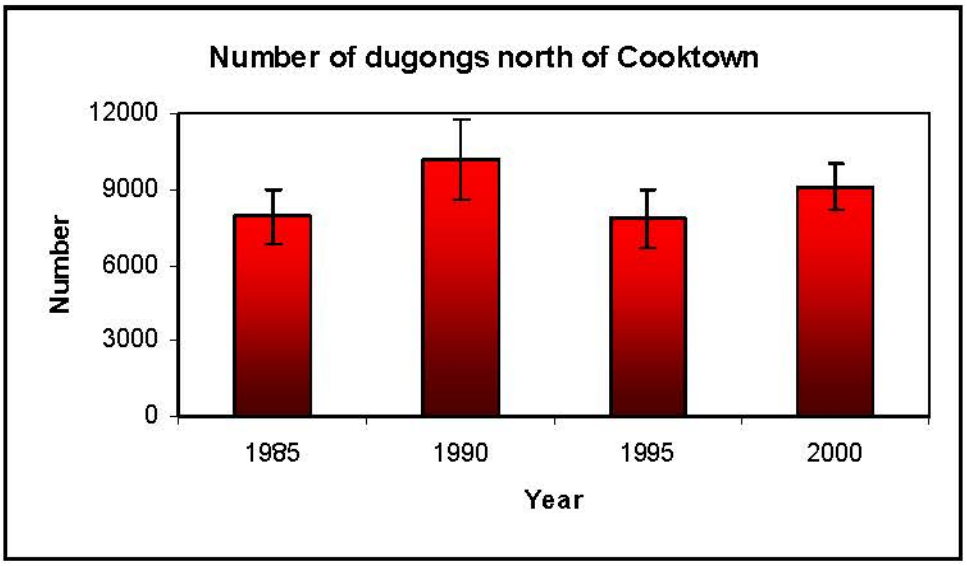
Condition

Dugongs (or sea cows) are marine mammals that are specialised for feeding on seagrasses. They inhabit shallow, tropical waters throughout the Indo-Pacific region with most of the world's population of dugongs found in northern Australia between Shark Bay in Western Australia and Moreton Bay in Queensland. Dugongs have a very low reproductive rate having one calf at intervals of 2.5-7 years. The maximum likely rate of increase of a dugong population, if all the females in the population are breeding at their maximum potential, is estimated at 5% per year. Thus, in order for numbers to be maintained, adult survivorship must be higher than 95% each year. The maximum sustainable mortality rate of adult females killed by human activities is around 1 or 2%. For other facts on dugongs, see the *Dugong Information Kit* (GBRMPA 2002).

Dugongs are specialised for feeding on seagrasses. They inhabit shallow, tropical waters throughout the Indo-Pacific region.

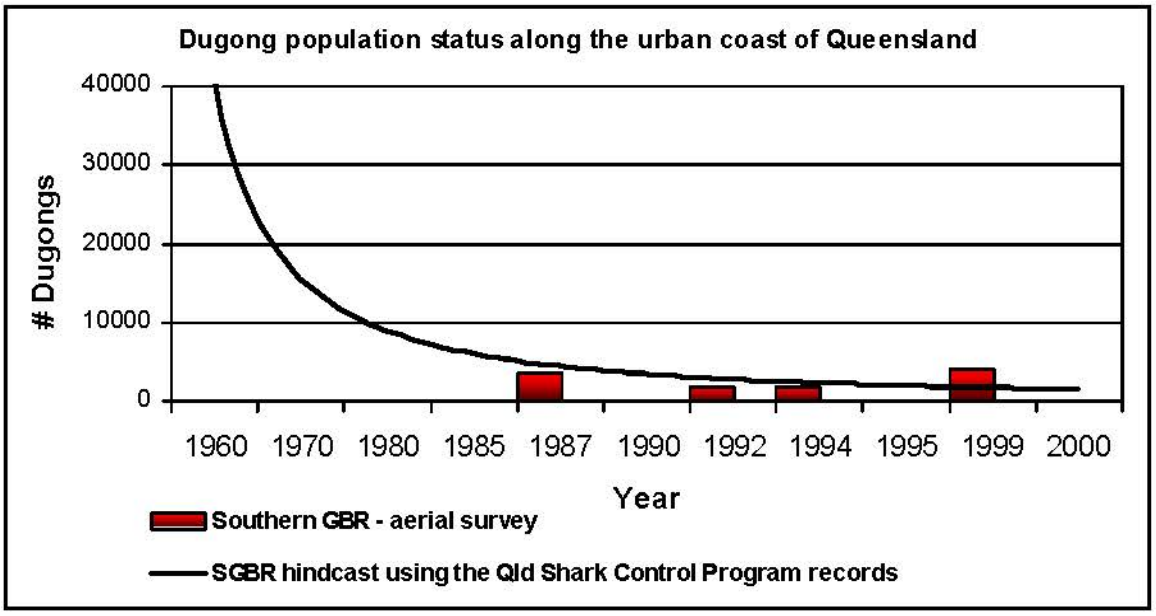
Worldwide, the dugong is listed under the 2003 IUCN - the World Conservation Union - Red List of Threatened Animals as being 'vulnerable to extinction' - criteria A1cd. This means that this species is at 'high risk of extinction in the medium-term future'. The *Dugong Action Plan* (Marsh *et al*, 2001b) provides an overview of dugong status, threatening processes and conservation initiatives from around the world. In Australia, dugongs are listed as 'vulnerable to extinction' under the Queensland Government's *Nature Conservation Act 1992* and are both a listed marine species and a listed migratory species under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*.

Aerial surveys of dugong populations commissioned by the Great Barrier Reef Marine Park Authority (GBRMPA) have been carried out by James Cook University since 1984. For the purposes of these dugong surveys, the Great Barrier Reef has been divided into the regions north of Cooktown and south of Cooktown. North of Cooktown, surveys were carried out in 1985, 1990, 1995 and 2000 (Marsh and Lawler 2002). The dugong population estimates did not vary significantly at each of the four counts, ranging from 7,843 (± 1155 standard error) to 10,176 (± 1575 standard error) dugongs.



The number of dugongs in the Great Barrier Reef north of Cooktown has remained stable since surveys started in 1986. The lines above and below each bar show the standard error, an indication of the uncertainty associated with the measurement.

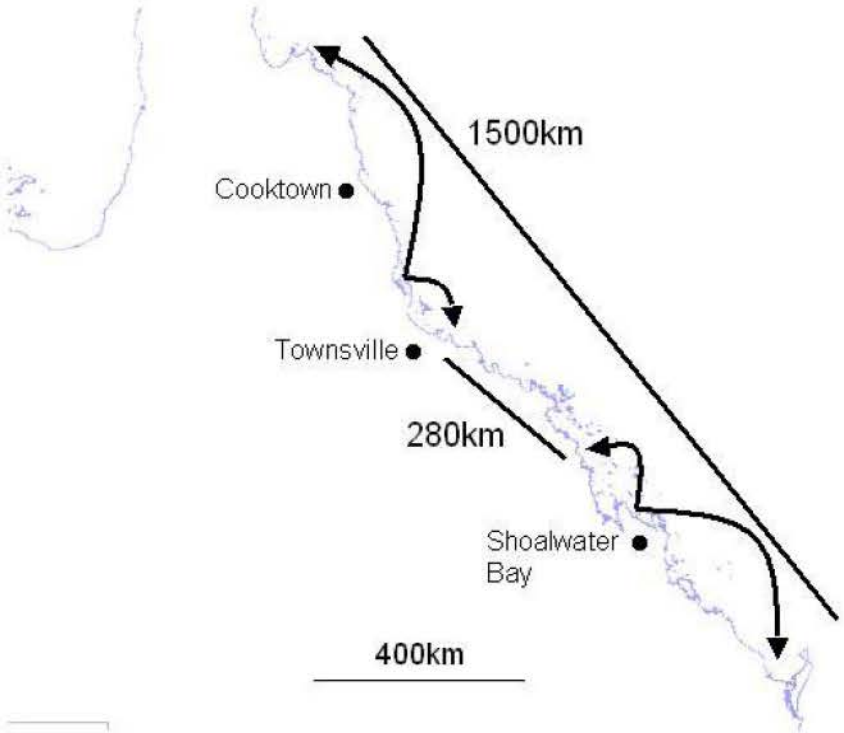
However, surveys south of Cooktown in 1986-1987, 1992, and 1994 documented a distinct decline in the dugong population from an estimated 3,480 (± 460) to an estimated 1,680 (± 240) dugongs within eight years. The results of the 1999 surveys (3993 ± 644) showed that numbers in the southern area were back at 1986-87 levels probably as a result of dugongs moving into the survey area from other parts of their range in Australia. Nonetheless an analysis of dugongs caught unintentionally in shark nets at bathing beaches indicates that the catch per unit effort in the nets has fallen to about 3% of the initial catch rates. If the assumptions underlying this analysis are correct, it confirms anecdotal information and the beliefs of Aboriginal elders that the dugong population along the urban coast of Queensland has declined drastically since the 1960s (Marsh *et al.* 2001a).



Dugong numbers in the Great Barrier Reef along the urban coast of Queensland have fallen by 97% since the 1960's. The results of aerial surveys indicate that the dugong population south of Cooktown is fluctuating at a level much lower than in the 1960's. It is too soon to say whether dugong numbers south of Cooktown are still declining, or increasing, or at what rate these declines or increases may be occurring.

More than 50 dugongs have been tracked (from 2 weeks to more than a year) using satellites on the east coast of Queensland (from Cooktown, Hinchinbrook/Cleveland Bay, Shoalwater Bay and Hervey Bay). Many of the dugongs moved greater than 80km, and some moved up to 800km.

This map gives a general indication of the distances moved by some of the 29 dugongs tracked along the east coast of Queensland using satellites



Based on Lawler, Marsh & Preen (2001) Regional-scale movements of dugongs on the Queensland coast: evidence from aerial surveys and satellite tracking. Southern Hemisphere Marine Mammal Conference, Philip Island

For further information click on the following reports:

- Research Publication #77 [Adobe Acrobat Format 1405.42KB] *Dugong distribution and abundance in the northern Great Barrier Reef Marine Park -November 2000.*
- Research Publication #70 [Adobe Acrobat Format 2305.91KB]
  Shark control records hindcast serious decline in dugong numbers off the Urban Coast of Queensland; and Dugong distribution and abundance in the southern Great Barrier Reef Marine Park and Hervey Bay: results of an aerial survey in October – December 1999.
- Research Publication #67
  Dugongs, Boats, Dolphins and Turtles in the Townsville-Cardwell Region and Recommendations for a Boat Traffic Management Plan for the Hinchinbrook Dugong Protection Area.

Pressure

There are several sources of pressure on dugong populations from human related threats. These include:

- Boat strike and disturbance from boats, ships and other motorised machines
- Habitat loss from coastal development and declining water quality
- Incidental catch in mesh net fishing and shark control programs
- Traditional hunting

Pressure: boat strike and disturbance

Collisions between boats and dugongs are one of the causes of dugong deaths related to human activities. Dugongs may be seriously injured by boat hulls if struck at high speed resulting in fractures and damage to internal organs. Cuts caused by propellers may lacerate organs killing the animal outright, or lead to serious infection or disability that may also result in death. The Queensland Parks and Wildlife Service (QPWS) Strandings Database recorded three dugongs being struck in the Great Barrier Reef between 1996 and 2001. There are also concerns that frequent boat activity can displace dugongs from their preferred habitats, although this is likely to be a less serious problem than the mortality resulting from boat strikes.

Boat strikes can inflict fatal injuries to dugongs © QPWS.

Pressure: habitat loss

Habitat loss and degradation is an impact that can have disastrous effects on dugong populations. In particular, seagrass habitats are important as seagrasses are the dugong's primary food. The most significant example of such an impact occurred just outside the Great Barrier Reef World Heritage Area (GBRWHA) in Hervey Bay. More than 1,000 km^2 of seagrasses were lost in 1992-93. Although the exact cause of the seagrass death was uncertain, it is likely to have been caused by a combination of effects from a tropical cyclone and highly turbid water from flooding and coastal run-off. Population estimates indicate that the number of dugongs in the area fell from 2,200 in 1988 to 800 in 1994.

Seagrass beds may also be affected by dredging activities and terrestrial run-off. Dredging can stir up large amounts of sediment that smother seagrasses nearby, and nutrient and sediment rich run-off can result in algal blooms and increased turbidity that can reduce the amount of light reaching seagrasses. However, it should be noted that large scale seagrass die-offs such as the Hervey Bay event have not been documented from the Great Barrier Reef Marine Park (GBRMP) since the 1970s. Indeed, repeat seagrass surveys at the two localities with the highest dugong densities in the southern Great Barrier Reef, Hinchinbrook Island and Shoalwater Bay, have indicated that seagrass areas have been stable in recent years.

Seagrass beds may also be disturbed by trawling. Trawlers generally avoid areas of dense seagrass habitat as the seagrass clogs the nets, however, areas of sparse seagrass growth may still be affected.

For more information on seagrass status and management activities, see *Environmental Status – Water quality* and *Environmental Status – Seagrasses*.

Pressure: incidental catch

As air breathing mammals, dugongs can drown within minutes of becoming entangled in a net if they are unable to reach the surface to breath. Commercial mesh netting is considered a

significant cause of dugong mortality and there is clear evidence of dugongs killed by mesh nets from the Strandings Database. However, net deaths are virtually never reported directly, and minimal information is available on the actual numbers of dugongs killed in this way. For more information about the inshore net fishery, see *Management status – Fisheries*.
Dugongs also risk becoming entangled in mesh nets deployed as part of the Queensland Shark Control Program. Between 1962 and 1992, 837 dugongs were killed in Shark Control Program mesh nets on the urban coast of Queensland (Queensland Department of Primary Industries 1992). The Shark Control Program was reviewed in 1992 and 1998 and very few dugongs are now killed in shark nets in the Great Barrier Reef region (see *Response*).

Pressure: traditional hunting

Dugongs are an important element of the traditional diet of Australia's Indigenous peoples, particularly for celebrations and family gatherings. A recent survey of Indigenous fishing in northern Australia estimated that over a twelve month period in 2000-01, 1,293 dugongs were taken by Indigenous hunters in north Queensland waters excluding the Torres Strait. The GBRMPA has reservations about this survey methodology because the harvest is extrapolated from a very small proportion of the catch. Recent modelling by scientists indicates that the current level of dugong hunting in some parts of the Great Barrier Reef is unsustainable.

Response

Response: protected species listings

The dugong in Australia is listed in Appendix I of the *Convention on International Trade in Endangered Species* (CITES) throughout its range. This listing recognises the vulnerable status of the dugong by IUCN, the World Conservation Union at a global scale. In Australia, dugongs are a listed species under the *Environment Protection and Biodiversity Conservation Act 1999* meaning that it is an offence to kill, injure, take, trade, keep, or move dugongs in the GBRMP without a permit. In Queensland, dugongs are listed as 'Vulnerable Wildlife' under the *Nature Conservation Act 1992* which prohibits the take, use or keeping of dugongs without a permit or specific exemption. The Cairns and Whitsunday Plans of Management also prohibit interference with dugongs.

Response: boat strike and strandings

A tri-agency (Queensland Parks and Wildlife Service, Department of Primary Industries and Fisheries, GBRMPA) approach is enabling close examination of dugong carcasses to establish the causes of mortality and obtain further information. The GBRMPA website enables the general public to subscribe to an E-mail Listserver that posts notices about each stranding soon after they are investigated.

Concern over vessel impacts on dugongs resulted in voluntary transit lanes being trialled in the Hinchinbrook region and an education campaign has been launched to encourage boaters to "go slow" in areas frequented by dugongs. The GBRMPA has also released a set of *Best Environmental Practices* for dugong-watching

Response: habitat loss

Seagrasses are protected under the *Great Barrier Reef Marine Park Act 1975* and *Queensland Fisheries Act 1994*. Further, under the new *Great Barrier Reef Marine Park Zoning Plan 2003*, some 24% of known shallow water seagrass beds are included in highly protected 'green

zones' that prohibit extractive activities. Outside of the GBRMP, many seagrass areas are protected as Fish Habitats Areas under the Queensland Fisheries Act 1994.

The GBRMPA is addressing the potential impacts of increased runoff of terrestrial sediments and nutrients through the *Reef Water Quality Protection Plan*. The Plan aims to halt and reverse the declining water quality in the Great Barrier Reef within 10 years.

Detailed information on how the GBRMPA is addressing pressure on seagrass habitats is included in the following chapters:

- *Environmental status – seagrasses*
- *Environmental quality – water quality*

Response: incidental catch

Dugong Protection Areas (DPA's) were introduced in 1997 as an initiative of the Great Barrier Reef Ministerial Council. In total, 16 Dugong Protection Areas were declared, all south of Cooktown in the region where the dugong population had declined. The Dugong Protection Areas were declared in places where there are many dugongs and/or important seagrass habitat. Mesh netting is restricted in Dugong Protection Areas and prohibited in the two most important dugong habitats south of Cooktown: Shoalwater Bay and Hinchinbrook. The reduction in mesh netting in areas of high dugong numbers is an important step towards assisting the recovery of the dugong population south of Cooktown.

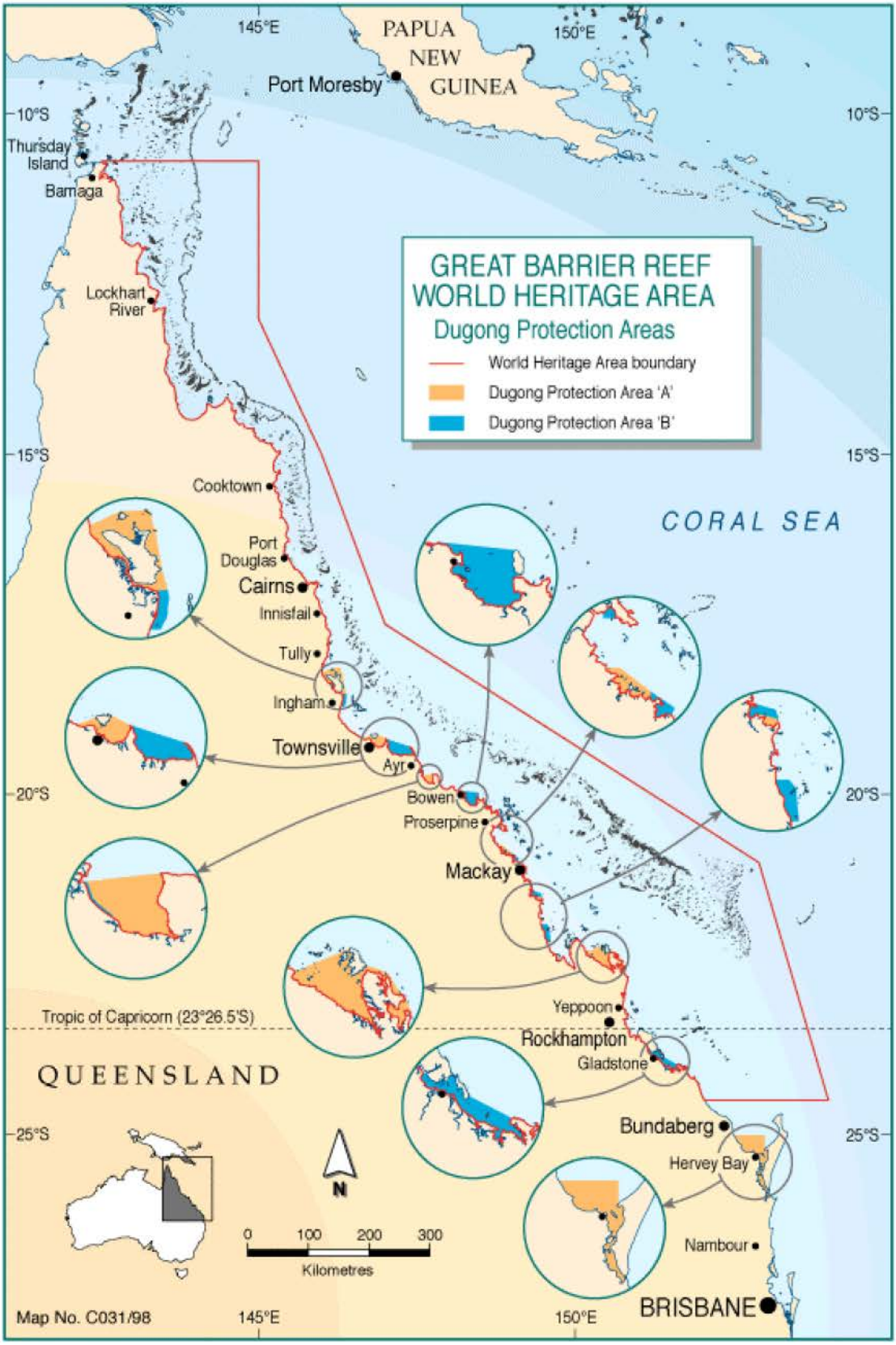
The management arrangements for the commercial net fishery are set out in the *Queensland Fisheries Act 1994* and *Fisheries Regulation 1995*. The Queensland Fisheries Service has indicated that resources will be directed to develop an East Coast Inshore Finfish Fishery Management Plan to address a variety of issues including incidental catch of non target species.

Since 1991, the Queensland Department of Primary Industries and Fisheries has conducted research on the effectiveness of acoustic alarms or 'pingers' to alert marine mammals such as dugongs to the presence of nets. These alarms have been successful in reducing the incidental capture of some species of cetaceans in gill nets in other countries. Unfortunately, experiments testing the effects of acoustic alarms on dugong behaviour indicate that they are unlikely to reduce the numbers of dugongs caught in nets. For more information on the management of the inshore gillnet fishery, see *Management status – fisheries* and *Environmental status – fishes.*

Concern over catch of dugongs, as well as dolphins and turtles, in nets set in the Queensland Shark Control Program led to a review of the program in 1992 that resulted in many nets being replaced with baited hooks known as "drum lines". Nets are now only deployed at ten locations within the GBRWHA, five near Cairns and five near Mackay. This reduced the number of dugongs caught by the Shark Control Program to less than 4.3 dugongs per year between 1992 and 1995 (Gribble *et al,* 1998). Shark control contractors record incidental catch of marine mammals and turtles, and the release of live animals is now a priority. Published records show that 17% of dugongs caught between 1992 and 1995 were released alive, giving an average mortality of about four dugongs per year (Gribble *et al,* 1998). More recently, evidence from the QPWS stranding reports indicate generally 1 to 2 dugongs are caught and killed each year in the program.

Response: traditional hunting

The hunting of dugongs and turtles is permitted within the GBRMP, however this activity is restricted to Aboriginal peoples and Torres Strait Islanders. A new system for managing traditional use of marine resources in the GBRMP will be starting on 1 July 2004 as part of the rezoning of the GBRMP through the Representative Areas Program. Some traditional uses of marine resources will continue to be 'as of right', while others will be conducted in accordance with a permit or Traditional Owner-developed and GBRMPA-accredited



Map showing the location of Dugong Protection Areas in the Great Barrier Reef Marine Park and Hervey Bay. More information on DPAs, including detailed maps, is available on the GBRMPA web site: http://www.gbrmpa.gov.au/corp_site/info_services/publications/dugong/sanctuaries.html

'*Traditional Use of Marine Resources Agreement*' (see *Management status – Indigenous connections with the Great Barrier Reef*). The intent of these Agreements is to ensure that marine resources such as dugongs are used sustainably. Some Aboriginal and Torres Strait Islander communities have made voluntary formal and informal decisions not to hunt, as a contribution to addressing the decline in dugong numbers in the southern Great Barrier Reef.

Response: research and monitoring

Because of concern over dugong populations, extensive monitoring through aerial surveys and other research is continuing. Research into the behaviour, ecology and conservation management of dugongs is also being undertaken through the Cooperative Research Centre for the Great Barrier Reef World Heritage Area. Research into the genetics of dugong populations is ongoing and in 1999 the GBRMPA collaborated with community groups, researchers, stakeholders and management agencies to develop a *Dugong Research Strategy*. The Strategy includes a list of research priorities organised into four categories:

- Maintaining or enhancing dugong numbers.
- Minimising impacts of management decisions on affected groups.
- Development of cooperative management arrangements.
- Enhancing the effectiveness of dugong protection measures.

Dugongs are also listed as a high priority in the GBRMPA's Research Priorities and Species Conservation Program.

Whales and Dolphins

Condition

Over 30 species of whales and dolphins visit or are resident in the Great Barrier Reef. Of these, two species of baleen whales, the humpback and the dwarf minke, are commonly seen during the winter. Bottlenose and spinner dolphins are also commonly seen and other whale and dolphin species reported from the Great Barrier Reef include Bryde's whales, pan-tropical spotted dolphins, false killer whales, killer whales, short-finned pilot whales, sperm whales and various beaked whales. Very little is known of the status of these species in the Great Barrier Reef, other than their occurrence in the region. For instance, the occurrence of Longman's beaked whale in the Great Barrier Reef is known only from a single stranding near Mackay, even though it was recently shown to be widely distributed throughout the Indo-Pacific (Dalehout *et al*, 2003). The conservation status of two inshore dolphin species, the Irrawaddy and Indo-Pacific humpback dolphins, are of special concern (Parra, Corkeron and Marsh 2004).

Humpback whales can be seen in the GBRMP during winter months

Little is known about the status of most of the dolphin and whale species found in the GBRMP

For a comprehensive table listing all of the protected species of whales and dolphins known to occur in

the Great Barrier Reef World Heritage Area and listed by the IUCN Red Data Books, or under Queensland or Australian Government legislation refer to Table 3 of the report "*Fauna and Flora of the Great Barrier Reef World Heritage Area*". All cetacean species in the Great Barrier Reef are protected under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* and under the Queensland Government's *Nature Conservation Act 1992*, regardless of their conservation status.

All cetaceans exhibit similar biological characteristics, being long-lived animals that may take many years to reach sexual maturity and have few offspring. Most cetaceans only produce one calf per breeding season, with two to three years or longer between breeding seasons. These characteristics make whales and dolphins very susceptible to pressures that may reduce survival rates or reproductive success, so that the cumulative effects of apparently minor impacts may be considerable. Furthermore, declines may take many years to become evident by which time it is too late to address the pressures causing the decline. The inherent vulnerability of these species requires a management approach that, where-ever possible, minimises all pressures on these species, and carefully considers the potential for cumulative impact of seemingly minor pressures over long time scales.

Detailed information on the current status of whales and dolphins can be found in the *Whale and Dolphin Conservation Policy for the Great Barrier Reef Marine Park.*

Condition: humpback whales

Since the early 1980's there have been annual surveys of humpback whales as they migrate north to the Great Barrier Reef at the start of winter. While these surveys do not take place inside the Great Barrier Reef Marine Park, they still monitor the population of animals that inhabit the Area during winter. At this time of year, humpback whales are commonly seen in many parts of the Great Barrier Reef.

On a global, national and Queensland scale, the humpback whale is listed as being 'vulnerable to extinction'. This means that this species is at 'high risk of extinction in the medium-term future'. In Queensland, the humpback whale population is recovering from the large-scale, industrialised whaling activities that occurred between 1949 and 1962. The most recent population survey was in 1998. This estimated the population at 4000 animals, with an annual increase of 11% (Vang 2002).

Condition: minke whales

Two different species of minke whale are found in Great Barrier Reef waters. The 'dwarf' minke is found throughout the area between March and October, with the largest number of records from the Cairns Section of the GBRMP (Arnold 1998, Birtles & Arnold 2002). The Antarctic ('dark shoulder') minke whale has rarely been seen in the GBRMP and is known primarily from strandings in the southern and central areas of the Great Barrier Reef. The minke whale was listed as 'common' in the Queensland Government's *Nature Conservation Act 1992*. The *2002 IUCN Red List of Threatened Animals* listed the dwarf minke whale as 'lower risk-near threatened', and the Antarctic minke whale as 'lower risk-conservation dependant'. However, the Queensland *Nature*

Dwarf minke whales are commonly seen in northern parts of the Great Barrier Reef, particularly from June-August.

Conservation Act 1992 does not distinguish between the two species. The Action Plan for Australian Cetaceans (Bannister, Kemper & Warneke 1996) listed the Antarctic minke whale as 'Secure' and the dwarf minke as 'No category assigned because of insufficient information'.

Condition: inshore dolphins

Three species of dolphins from the Great Barrier Reef are classified as inshore species: Indo-Pacific hump-backed dolphins, Irrawaddy dolphins and bottlenose dolphins. Bottlenose dolphins are found throughout the Great Barrier Reef, not just inshore, and probably represent two distinct species (Stokes *et al,* 2002). The Indo-Pacific hump-backed dolphin and the Irrawaddy dolphin are listed as 'rare' under the Queensland Government's *Nature Conservation Act 1992*. Both were listed in the Action Plan for Australian Cetaceans as "Insufficiently Known" but suspected to be endangered or vulnerable. Refer to Table 3 of the *Fauna and Flora of the Great Barrier Reef World Heritage Area* report. Recent research, including genetic studies, suggests that humpback and Irrawaddy dolphins in Australian waters may be subspecies or separate species to those elsewhere and, hence, Australia's only endemic cetaceans (Beasley *et al,* 2002; Parra *et al,* 2004).

There is concern about apparent declines in populations of hump-backed dolphins and Irrawaddy dolphins (Smith *et al,* 2003) throughout their range including the Great Barrier Reef region. However, there is not enough information to make a robust assessment of the conservation status of these dolphins in the Great Barrier Reef. The only available information on numbers of groups of Indo-Pacific humpback dolphins (not actual population estimates) sighted during aerial surveys, suggests that the population is probably declining. There were even lower numbers of sightings of Irrawaddy dolphins in aerial surveys than humpback dolphins, suggesting either that they are relatively uncommon in Australian waters or that they are inadequately sampled by aerial surveys (Parra *et al,* 2002). Current research (G. Parra, James Cook University) is looking at populations in the central and northern GBR, using boat-based surveys. Hale (1997), Corkeron *et al,* (1997), Parra *et al,* (2002) and Parra, Corkeron & Marsh (2004) summarise existing data on the distribution, status and conservation of inshore dolphins in Australia.

Pressure

Whales and dolphins are subject to a wide variety of impacts from human activities, with different species being subject to different pressures. Key human-related impacts include boat strike and entanglement in nets (both commercial fishing and those set for bather protection), although very little is known about interactions with mesh nets. Other impacts that may affect whales and dolphins are:

- prey depletion
- pollution
- noise
- habitat destruction from coastal development
- whale watching (principally of humpback and dwarf minke whales).

Marine debris can be ingested and animals can become entangled.

Detailed information on the human activities likely to adversely impact on cetaceans can be found in the supporting document to the GBRMPA's *Whale and Dolphin Conservation Policy*.

Pressure: whale watching and tourism

The annual migration of humpback whales along the east coast of Australia has led to the development of a tourist whale-watching industry, particularly in Hervey Bay, but also in the Whitsundays and Cairns areas. In the GBRMP, whale watching is primarily undertaken as an opportunistic activity on board vessels that focus on carrying passengers to specific reefs or islands in the Great Barrier Reef. Vessel activity from whale-watching operations has been shown to affect the behaviour of humpback whales. However, it is unknown whether whale watching has long-term detrimental effects such as changes in migration routes and habitat use or decreased reproductive success.

In addition to the whale-watching industry for humpbacks, there is a relatively new industry in watching and swimming with dwarf minke whales. This industry is located in the vicinity of the Ribbon Reefs, northeast of Port Douglas. The major difference between watching humpbacks and dwarf minkes is that all humpback watching occurs from on board a boat, whereas dwarf minke interactions often occur with the watchers in the water with the whales. This is such a new activity that the effects on the whales are not fully documented yet. Research into these effects is underway. Reports on the sustainable management of swimming with dwarf minke whales on the GBR are available (Birtles *et al*,, 2002a, Birtles *et al.* 2002b).

Pressure: boat strike

The incidence of vessel strikes on whales and dolphins is believed to be low. Between 1998 and 2000, three cases of mortality attributable to boat strikes were recorded in the Marine Wildlife Stranding and Mortality Database. However, there are other incidences where known boat strikes have occurred and the fate of the animal is unknown. The increasing humpback whale population, and rising boat traffic in inshore areas suggest that boat strike incidences are likely to increase in the future.

Boat strike is one of the key human-related impacts on cetaceans. This Indo-Pacific humpback dolphin shows what may be marks of propeller strike.

Pressure: marine debris

Whales and dolphins may ingest foreign matter such as plastic bags which can lead to serious gastro-intestinal blockages, potentially causing the animal to starve. Whales and dolphins may also become entangled in debris which can hinder their movement and in severe cases cause them to drown. In 2000, a Bryde's whale with almost six square metres of supermarket bags, food packaging, two-metre long plastic sheets and fragments of garbage bags stranded in Cairns.

Pressure: incidental catch

As for dugongs, stranding data suggest that mesh netting is a significant cause of mortality for inshore dolphin species and include confirmed cases of dolphin deaths from mesh net entanglement. However, information on actual numbers of dolphins killed in these nets is

limited because entanglements are very rarely reported. For more information on the inshore net fishery see *Management status – Fisheries*.

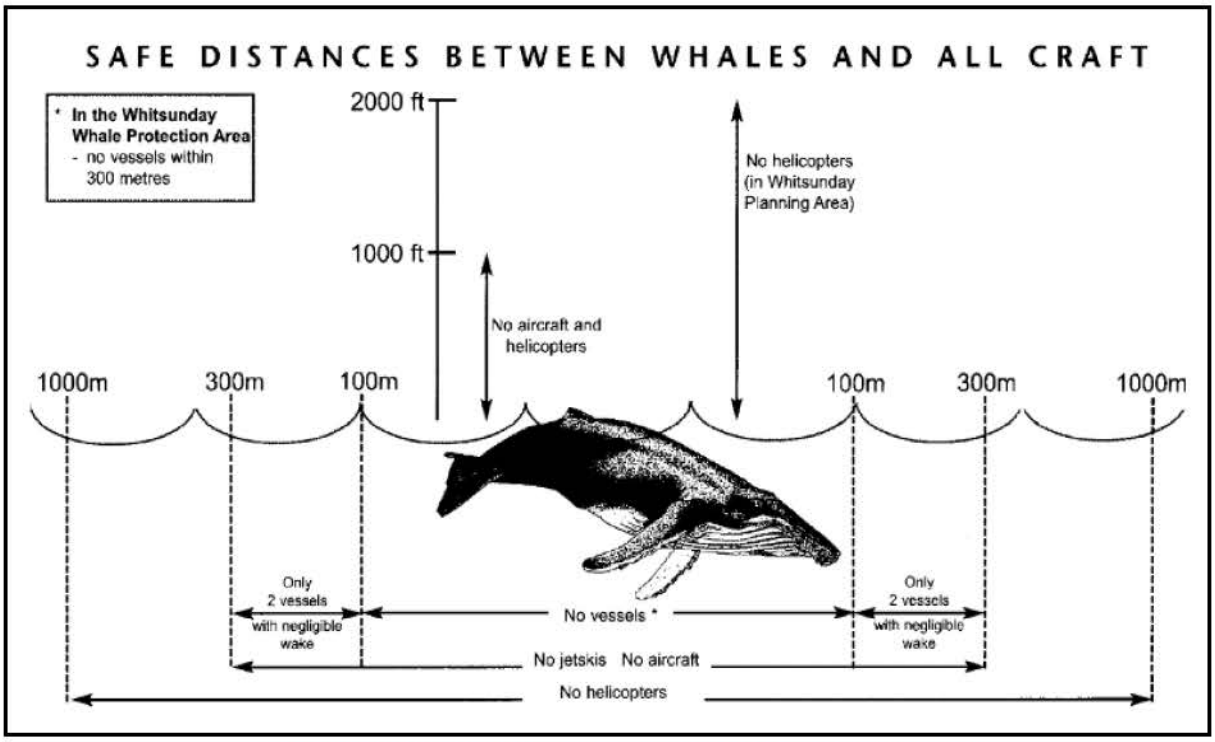
Published data from the Queensland Shark Control Program (1962 to 1995) indicate that incidental catch for the Program included eight humpback whales, approximately 60 other whales, and 630 dolphins. Five of the eight humpback whales were released alive but their post release fate is unknown. On average, 19 dolphins and three whales were caught per year between 1962 and 1995 (Gribble, McPherson & Lane 1998). As there is little information about the population status for whales and dolphins in the Great Barrier Reef, it is unknown whether the mortality of whales and dolphins in shark control equipment has a significant impact on these populations. However, given the inherent susceptibility of these animals, and the cumulative stress of multiple pressures, a precautionary management approach is required.

Response

Response: whale watching and tourism

Until it is established whether this activity has serious impacts on the whales, whale watching will continue to be managed in a precautionary manner to ensure that the whales are unharmed by human activities. In 2000, the Authority published a *Whale and Dolphin Conservation Policy for the Great Barrier Reef Marine Park*. This policy complements measures addressed in *Queensland's Nature Conservation (Whale and Dolphin) Conservation Plan 1997*, and those of the Department of Environment and Heritage, including the *Action Plan for Australian Cetaceans*. Implementation of the Policy is proceeding especially in regard to:

- whale-watching and swimming-with-dwarf minke whale requirements;
    - in 2003, nine permits were granted for swimming with dwarf minke whale activities in the Cairns area;
- the development of regulations for interactions with whales and dolphins, including whale watching to complement those under the *Environment Protection and Biodiversity Conservation Act 1999*;
- review and develop education programs to inform stakeholders and the public; and
- the preparation and publishing of *Best Environmental Practices* for whale watching.



Codes of Conduct and Best Environmental Practices include information such as safe distances between vessels and whales.

Response: boat strike and marine debris

A tri-agency (Queensland Parks and Wildlife Service, Department of Primary Industries, GBRMPA) approach is enabling close examination of whale and dolphin carcasses to establish the causes of mortality and obtain further information. The GBRMPA website enables the general public to subscribe to an Email Listserver that posts notices about each stranding soon after they are investigated.

The GBRMPA has prepared *Best Environmental Practices* to educate boaters on the risks vessels pose to marine wildlife and how to minimise the impacts of their activities. Voluntary transit lanes and speed restrictions are currently being trialled in the Hinchinbrook region.

In 2003 the Department of Environment and Heritage commissioned the preparation of a national recovery plan for Humpback Whales, Fin and Sei Whales, a national review of the conservation status of smaller whales and dolphins, and a national review for the coordination of sampling from live and dead stranded whales.

The disposal of waste at sea in the GBRMP is prohibited. While the runoff of litter into the GBRMP from the land is regulated by State and local government and is outside the jurisdiction of the GBRMPA, in recent years some local councils have taken steps to reduce the amount of litter washing into the GBRMP from local waterways and storm water drains. The GBRMPA is working with State and local governments on a wide range of water quality initiatives specifically designed to minimise the impacts of declining water quality on the marine environment (see *Environmental status – water quality*). The GBRMPA has also produced *Best Environmental Practices* to educate reef users about the correct disposal of waste. Education programs such as the Reef Guardians program educates school students about reducing the run off of litter into local waterways, and initiates actions to reduce litter at the local community level.

Education programs teach students to take action to reduce the run-off of litter into the local waterways of their communities.

Response: incidental catch

Concern over catch of dolphins, as well as dugongs and turtles, in nets set in the Queensland Shark Control Program has led to many nets being replaced with baited hooks since 1992. Currently shark nets are only deployed at ten locations in the GBRWHA, five nets in Cairns and five nets in the Mackay area. Between 1992 and 1995 between 12 and 13 dolphins were caught each year, a reduction from the average of 19 animals per year between 1962 and 1992 (Gribble *et al,* 1998). Research into methods of reducing incidental catch of whales and dolphins using sonic alarms and pingers in underway in Cairns and on nets deployed outside the GBRMP in south-east Queensland.

Mesh-netting restrictions in Dugong Protection Areas may reduce the mortality of inshore dolphins. The assessment of these and alternative management activities will require better information on population levels and dynamics. Development of methods for targeted monitoring of populations of these species and research into effects of human pressures is under way. Until this information is available, a precautionary approach is required in management strategies.

Summary

Dugongs

- Dugongs are unusual coastal-dwelling marine mammals unrelated to whales and dolphins.
- Globally, and in Queensland, they are considered vulnerable to extinction.
- In the GBRWHA, repeated monitoring indicates that populations in the far north are relatively stable, whilst those south of Cooktown have suffered serious declines.
- There is significant concern that the southern GBR dugong population may not be recovering.
- The principal pressures on dugong populations are mortality in mesh and shark nets, traditional hunting, habitat degradation, displacement from habitat and increasing potential for boat strike.
- Dugong Protection Areas have been established which eliminate or restrict mesh netting in significant dugong habitats.
- The use of shark nets has been significantly reduced within the Great Barrier Reef, however the remaining nets continue to pose a threat.
- Indigenous communities are working with the GBRMPA to ensure hunting activities are undertaken in a sustainable manner.

Whales and Dolphins

- Baleen whales in the GBRWHA include the humpback and two forms of minke whale.
- The number of humpbacks is currently increasing after intensive whaling, which ceased in 1962.
- The status of the minke whale is uncertain for the 'dwarf' form and 'common' or 'secure' for the Antarctic minke.
- The whale-watching industry is a potential pressure within the Great Barrier Reef. This industry is being managed to minimise interference and harassment to the animals.
- The use of nets set in the Queensland Shark Control Program has been significantly reduced within the Great Barrier Reef, although the remaining nets continue to pose a threat.
- The status of the various species of dolphins or toothed whales inhabiting the World Heritage Area is not known.
- There is particular concern for two inshore species; the Indo-Pacific hump-backed dolphin and the Irrawaddy dolphin, due to their conservation status and vulnerability to cumulative pressures such as mesh netting, shark nets and habitat destruction and degradation.

Further Reading

About dugongs:

- GBRMPA: Facts about dugongs
- CRC Reef: About the Reef: dugongs
- Reef ED Great Barrier Reef Explorer: dugongs

About whales and dolphins:

- GBRMPA: Threatened Species, whales and dolphins
- CRC Reef: About the reef, minke whales
- Reef ED Great Barrier Reef Explorer: Whales and dolphins

About Minke Whales
- CRC Reef brochure: *Dwarf minke whales in the Great Barrier Reef, Current state of knowledge, May 2002*

About whale watching:
- EPA: Watching wildlife, whale watching
- GBRMPA: Best environmental practices for dugong, dolphin and whale watching

About threats to marine mammals, strandings and boat strike
- GBRMPA: Threats to marine wildlife
- EPA: Marine strandings

Research programs on dugongs and cetaceans:
- CRC Reef: Program A, Conserving World Heritage values
- CRC Reef: Towards ecologically sustainable dwarf minke whale tourism

Research publications about the Great Barrier Reef (including dugongs and cetaceans) are available at:
- http://www.gbrmpa.gov.au/corp_site/info_services/publications/index.html
- http://www.reef.crc.org.au/publications/techreport/index.html

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