

# Dugong Information Kit

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**D**ugongs are in trouble in the southern part of the Great Barrier Reef World Heritage Area south of Cooktown. Numbers are declining so quickly that without immediate action dugongs are facing a high risk of disappearing from this area.

This kit provides information on dugongs in the World Heritage Area. It outlines actions that are proposed and/or underway for dugong conservation.

The following information sheets are enclosed:

- Declining Dugongs: dugongs in the southern Great Barrier Reef World Heritage Area.
- Shark control records hindcast dramatic decline in the dugong.
- Facts about dugongs.
- Aboriginal and Torres Strait Islander Culture and dugong.
- Threats to dugongs.
- Great Barrier Reef Ministerial Council.
- Actions for dugong conservation.
- Marine wildlife hotline.
- Dugong protection areas and mesh netting.
- Working together to protect dugongs in Shoalwater Bay: a case study.

Please use the kit to inform others about the issue. Material may be reproduced provided acknowledgment is given to the Great Barrier Reef Marine Park Authority.

Additional information is available from the:

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# Declining dugongs: dugongs in the southern Great Barrier Reef World Heritage Area

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**D**ugong numbers have declined dramatically in recent years in the southern part of the Great Barrier Reef World Heritage Area south of Cooktown and the species is facing the threat of disappearing from this area. The Great Barrier Reef Ministerial Council, comprising the Commonwealth and Queensland Ministers for the Environment and for Tourism, is concerned about the decline and has instigated a number of actions to reverse the trend. Government departments, community groups and industry organisations are working to minimise the number of dugong deaths from human-related causes.

## ***The situation***

- Aerial surveys commissioned by the Great Barrier Reef Marine Park Authority covered 39 000 square kilometres of the inshore waters of the southern World Heritage Area in 1986–87, 1992, 1994 and 1999. Between 1986 and 1994, they detected a significant population decline from an estimated 3480 (+/- 460) to an estimated 1680 (+/- 240) within eight years. Whilst the results of the 1999 surveys showed that numbers in the southern area were back at 1986/87 levels (3993 ± 644), an analysis of dugongs caught unintentionally in shark nets at bathing beaches has confirmed that the dugong population in urban areas of the Queensland coast with nets is 3% of that in 1962. This was when the Queensland Shark Control Program commenced (see sheet on 'Shark control records hindcast dramatic decline in the dugong').
- Experts consider that the decline in dugong numbers is due to unsustainable mortality from human-related causes such as habitat loss or degradation, commercial mesh nets (fish nets), shark nets set for bather protection, Indigenous hunting, boat strikes, defence activities and illegal take.
- The largest and most important remaining concentrations of dugongs in the southern part of the World Heritage Area, are in the Shoalwater Bay, Cardwell/Hinchinbrook, and Cleveland to Upstart Bay areas.

## ***Sustainable loss from human-related causes***

The dugong population in the southern Great Barrier Reef can only cope with a human-caused mortality of less than 1–2% each year. This means that if there are 200 dugongs in a bay, the population can only cope with the loss of two to four dugongs per year from all human causes (i.e. fishing, boat strikes and Indigenous hunting).

## ***Management requirement***

Reduce loss of dugongs from human-related causes to as low as possible.

## ***Management response:***

The Great Barrier Reef Ministerial Council has put in place measures aimed at arresting the decline. Habitat degradation and the effects of mesh net fishing, shark netting, Indigenous hunting, boating, defence training and illegal take are being addressed.





# Shark control records hindcast dramatic decline in the dugong

The following two James Cook University studies commissioned by the Great Barrier Reef Marine Park Authority shed new light on historical and current dugong numbers on the southern Great Barrier Reef and southeast Queensland coast.

- *Shark control records hindcast serious decline in dugong numbers off the urban coast of Queensland* by Helene Marsh, Glenn De'ath, Neil Gribble and Baden Lane.
- *Dugong distribution and abundance in the southern Great Barrier Reef Marine Park and Hervey Bay: results of an aerial survey in October-December 1999* by Helene Marsh and Ivan Lawler.

The studies complement each other with the first report providing a long-term context for interpretation of the second.

In the first report, a 38-year data set (1962-1999) collected by the Queensland Shark Control Program (QSCP) was analysed to assess trends in dugong numbers between Cairns and the Gold Coast. Because regular aerial surveys of dugong numbers in the area only commenced in 1986/87, it was important to take advantage of the information provided by the QSCP records.

The QSCP analysis showed that the number of dugongs caught in shark nets at shark contract areas between latitudes 17° and 28° S has declined significantly since the inception of the Program in 1962. The estimated rate of decline averaged 8.7% per year for dugongs caught per beach per year from 31 beaches in six localities. Thus, by 1999 the bycatch of dugong in the nets was 3.1% of the initial catch rate in 1962 over the 38 year sampling period (1962-99). If dugong catches in shark nets are a reliable index of dugong numbers, and if the depletions occurred at regional rather than local scales, the dugong population in the Great Barrier Reef would have been of the order of 50 000 animals in the early 1960s based on the 1986/87 population estimate for the area.

The reliability of the analysis as an estimate of a general decline in the dugong populations from Cairns south, depends upon assumptions that: (1) the catch of dugongs was dependent on dugong population density in the contract area, (2) dugongs did not learn to avoid the nets, or (3) dugongs had not been alienated from the contract areas by increased human use of the beaches. The first two potentially confounding factors are likely and there is no data to reject or support the third factor. At the very least, the netting data suggest a substantial depletion in dugong numbers along the urban coast of Queensland since the early 1960s. This result accords with anecdotal reports by long-term residents including Indigenous peoples of a decline in dugong numbers.

The second report provides the results of a further aerial survey in the series that have been conducted since mid 1986/87 at approximately 5-year intervals (1992,1994,1999) to monitor the status of the dugong on the Queensland coast south of Cooktown. It is the first estimate of dugong abundance in the area since a number of dugong conservation initiatives were instituted by the Great Barrier Reef Ministerial Council in 1997 including the establishment of the Dugong Protection Areas, changes to large mesh-netting practices, and a decision not to issue permits for traditional hunting of dugongs in the area.

The results of the 1999 survey indicate that dugong numbers in both the southern Great Barrier Reef and Hervey Bay areas in October-December 1999 were significantly higher than the corresponding estimates in 1994, but not significantly different from those of 1986/87. Most of the increase since 1994 was in the northern part of the survey area (the Central Section of the Great Barrier Reef Marine Park).

The increase is unlikely to be explainable solely by changes in dugong sighting conditions. It is also not possible for the increase since 1994 to be solely the result of reproduction because the species cannot breed rapidly.



## Shark control records hindcast dramatic decline in the dugong

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The most plausible explanation for most of the increase observed is movement of substantial numbers of dugongs into the survey area, probably from the area north of Cooktown. In addition, a northerly movement of dugongs from Moreton Bay cannot be ruled out because the survey of Moreton Bay was incomplete.

### Conclusion

Large-scale movements of dugongs into the survey area is the most likely reason for the 1999 increase in dugong numbers in the southern Great Barrier Reef. While there is no direct evidence for such movements, there is increasing evidence that seagrass abundance fluctuates over spatial scales of hundreds of kilometres in response to extreme weather events. Satellite tracking of dugongs has shown that dugongs can move large distances. For example, one animal has been tracked moving hundreds of kilometres in a few days from the Hinchinbrook Island area to Princess Charlotte Bay in the northern Great Barrier Reef.

These studies support the establishment and location of the Dugong Protection Areas (DPAs) since they provide increased protection to a significant proportion of the dugongs in the area (see 'Dugong Protection Areas and mesh netting'). As with previous surveys, over 50% of dugongs in the southern Great Barrier Reef were located in Zone A DPAs (10% of the 1999 survey area in this area). An additional 22% were in Zone B DPAs (9.3% of the survey area in the southern GBR). In Hervey Bay / Great Sandy Straits 72.5% of dugongs were in the Zone A DPA (18.3% of the survey area). Over the entire area and based on mean population estimates, 58% of the estimated dugong population was in the Zone A DPAs and 16% in Zone B DPAs.

The analysis of dugong by-catch in shark nets suggests that the aerial surveys between 1986/87 and 1999 monitor fluctuations in population numbers far below those in the 1960s, which in turn probably reflect numbers much below those at the time of European settlement. Thus, dugong conservation initiatives on the Great Barrier Reef must aim to not only monitor dugong numbers to ensure that they do not continue to fall, but also to ensure that they recover to levels previously present. This requires whole-of-habitat approach to dugong conservation.

Copies of the reports can be downloaded from the GBRMPA website at [http://www.gbrmpa.gov.au/corp\\_site/info\\_services/publications/research\\_publications/rp70/index.html](http://www.gbrmpa.gov.au/corp_site/info_services/publications/research_publications/rp70/index.html).



# Facts about dugongs (*Dugong dugon*)

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**D**ugongs, or sea cows as they are sometimes called, are marine animals which can grow to about three metres in length and weigh as much as 400 kilograms. They are the only marine mammals in Australia that live mainly on plants. The name sea cow refers to the fact that they graze on the seagrasses which form meadows in sheltered coastal waters. As dugongs feed, whole plants are uprooted and a telltale-feeding trail is left.

## Relatives

Dugongs are more closely related to elephants than to marine mammals such as whales and dolphins, but their closest living aquatic relatives are the manatees. Manatees are aquatic mammals that live in freshwater rivers and coastal waters of West Africa, the Caribbean, South America and the southern United States (Florida). Another close relative was Steller's sea cow, previously found in the northern Pacific. It was hunted to extinction in the 1700s by sealers for its meat. It grew almost three times as long as the dugong and fed on large algae (kelp).

## Distribution

Dugongs inhabit shallow, tropical waters throughout the Indo-Pacific region. Most of the world's population of dugongs is now found in northern Australian waters between Shark Bay in Western Australia and Moreton Bay in Queensland.

## Life in the sea

Dugongs swim using their whale-like fluked tail and they use their front flippers for balance and turning. Their movements are often slow and graceful. Early explorers and sailors believed that they were mermaids because of their streamlined bodies and the large teats at the base of their flippers.

They have a rounded head with small eyes and a large snout. The nostrils are at the top of the snout and, like mammals, dugongs must surface to breathe. However, unlike other aquatic mammals such as some whales, dolphins and porpoises, dugongs cannot hold their breath under water for very long. It is generally for only a few minutes, especially if they are swimming fast.

Dugongs have poor eyesight but acute hearing. They find and grasp seagrass with the aid of coarse, sensitive bristles, which cover the upper lip of their large and fleshy snout. Small tusks can be seen in adult males and some old females. During the mating season, male dugongs use their tusks to fight each other.

## Life history

Dugong life history is made of finely balanced population parameters.

Maximum longevity (most die at a younger age)	~70 years
Pre-reproductive period (females)	6-17 years
Pre-reproductive period (males)	4-16 years
Gestation period	13-15 months
Litter size	1
Lactation length	14-18 months
Calving interval	3-7 years
Maximum possible rate of increase (e.g. low natural mortality & no human-induced mortality)	~ 5% per year
Estimated natural mortality rate	~ 5% per year

The slow breeding rate and long life span mean that dugongs are particularly susceptible to factors that threaten their survival. Throughout their worldwide range they are threatened by human impacts, particularly on their habitat.







# Aboriginal and Torres Strait Islander Culture and dugong

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**A** boriginal groups have lived along the Great Barrier Reef region in excess of 40,000 years. The Great Barrier Reef is part of their culture and spirituality, and has provided food for their subsistence tribal lifestyle. Today, Aboriginal people live a more modern lifestyle however still maintain their cultural practices, including traditional hunting.

Torres Strait Islanders have lived in the Torres Strait for an estimated 10,000 years or more. Torres Strait Islanders have traditionally sailed south along the Great Barrier Reef and Cape York Peninsula coastline and made contact with Aboriginal groups for exchanges of technology, culture and goods. More recently, Torres Strait Islanders have moved south to settle in towns adjacent to the Great Barrier Reef World Heritage Area.

Dugongs are an essential element of the maritime culture of Aboriginal and Torres Strait Islander peoples living along the Great Barrier Reef World Heritage Area. This is a culture that has evolved over time through the introduction, adoption and use of new technologies in a method similar to all Indigenous and Non – Indigenous societies around the world. For example, wooden outrigger canoes were one form of transport used to access reefs and islands, but today small motorised boats have largely replaced them for traditional activities.

The activities associated with the hunting of the dugong and preparing the meat has great significance and is an expression of the continuance of long cultural traditions. Great importance is placed on the social sharing of the meat with members of the family. In addition, marine food resources such as dugongs strengthen Aboriginal and Torres Strait Islander culture and demonstrate connection with tradition and sea country.

Aboriginal and Torres Strait Islander people have a very good knowledge of dugongs, their habits and their environments and some communities have noticed that dugongs are now not common in areas where they were once seen in great numbers. These communities are very concerned about the well-being of the dugong population.

Consistent with the Great Barrier Reef Marine Park Authority's policy not to issue permits for hunting dugongs in the southern Great Barrier Reef, 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.

Aboriginal and Torres Strait Islander communities are keen to be involved in the management of dugong and the protection of dugong habitat in the Marine Park. Co-operative arrangements between Aboriginal and Torres Strait Islander groups and managing agencies are being explored. The GBRMPA, through its Indigenous Policy and Liaison Unit, provides support to community based management initiatives at a local scale.

The aim of these initiatives is to facilitate an active role for Aboriginal and Torres Strait Islander involvement in the sustainable management of dugong stocks whilst maintaining their living maritime culture.





# Threats to dugongs

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**N**atural factors such as predators, cyclones and disease have always caused dugong deaths. In a natural balance, enough dugongs are born to replace those that die and the population remains healthy. When the number of deaths is greater than the number of births the population will decline. In recent years human activities have created new causes of dugong deaths and threatened their life-supporting habitat.

## ***Loss of seagrass meadows***

Dugongs depend on healthy seagrass meadows to survive. The dumping of dredge wastes and the discharge of silt from coastal rivers can reduce the amount of light available to seagrass communities thereby limiting their growth. Clearing and agricultural activities in a river's catchment can increase the amount of silt and chemical nutrients and pollutants washing into the sea, particularly after heavy rains. Trawling by commercial fishing vessels and pollution from urban run-off or ships can also damage seagrass meadows. Many areas of seagrass in the Great Barrier Reef Marine Park have been identified and restrictions on trawling and dredge dumping have been implemented in these areas.

## ***Mesh netting***

Dugongs can only hold their breath for a few minutes, and quickly drown once entangled in a net. Dugongs are known to entangle in certain types of mesh nets and drown in the Great Barrier Reef World Heritage Area. As a result, the setting of certain nets in prime dugong habitat areas has been prohibited or restricted (see sheet on 'Dugong Protection Areas and mesh netting'). The fishing industry cooperates in the conservation of dugongs.

## ***Shark netting for bather protection***

Nets that are set to catch sharks near bathing areas have also been responsible for the death of more than 500 dugongs in the Great Barrier Reef World Heritage Area since the early 1960s. There have been reviews of the Queensland Shark Control Program in 1992 and 1997-99, which have resulted in a number of nets being replaced with drum lines. One dugong was captured by the shark control program in Alma Bay, Magnetic Island in March 1999, the first since 1995. The net in which it was caught has since been replaced with drumlines.

## ***Indigenous hunting***

Aboriginal and Torres Strait Islander peoples have hunted dugongs for thousands of years. For Indigenous culture, dugongs hold cultural, spiritual, social and economic significance. Dugongs are very important for special social and cultural celebrations such as weddings and funerals. They are spiritually significant and many coastal Indigenous communities have integrated them in their stories and accounts of the past (see sheet on 'Aboriginal and Torres Strait Islander Culture and dugong').

## ***Boat strikes***

Boating and shipping also may create hazards for dugongs. Dugongs may be killed or injured when struck by any part of a boat and also may be scared away from their feeding areas by boat traffic. It can be difficult for people travelling in a boat to detect dugongs in the cloudy inshore waters of the reef, so they need to travel slowly in these areas and be aware that dugongs may be feeding beneath them.



### ***Defence activity***

Potential impacts arising from Defence activities include detonations of explosives, the use of live munitions and the use of active sonar and other acoustic devices. Shock waves from explosives can kill or injure dugongs, or cause displacement of animals from areas. The Great Barrier Reef Marine Park Authority liaises with the Department of Defence to reduce the impacts of these activities on dugongs.

### ***Illegal take***

Illegal fish netting and illegal hunting result in an unknown number of dugong deaths. The extent to which they have been, and are, adversely affecting dugong populations is difficult to estimate. The extent and potential effects of illegal take of dugongs are of considerable concern to nature conservation agencies. The Commonwealth and Queensland Governments have increased funding for surveillance and enforcement in the Dugong Protection Areas.

### ***Live stranded or dead dugongs***

Park management authorities should be notified urgently of any live or dead dugongs found stranded on a beach. Telephone the Marine Wildlife Hotline on 1300 360 898 (local call cost).



# Great Barrier Reef Ministerial Council

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In 1997 the Great Barrier Reef Ministerial Council established a system of 16 Dugong Protection Areas (DPAs) in the southern Great Barrier Reef. Establishment of the protection areas was an historic initiative for saving the dugong and protecting the world heritage values of the Great Barrier Reef. The move followed scientific evidence of a dramatic decline in dugong numbers between Cooktown and Hervey Bay.

The Ministerial Council is chaired by the Commonwealth Minister for the Environment and Heritage and includes the Commonwealth Minister for Tourism and Queensland Ministers for Environment and Tourism. The Queensland Minister for Primary Industries also attends meetings regarding dugong conservation.

Aerial surveys and studies indicate that dugong numbers in the southern Great Barrier Reef have fallen significantly since 1962. The establishment of the DPAs was a turning point in efforts to save dugongs in the southern Great Barrier Reef.

Measures to implement the DPA system entered into force on 12 January 1998. Under the measures, forms of mesh netting that represent a risk to dugongs have been prohibited or restricted in Zone 'A' protection areas. In Zone 'B' protection areas, relevant fishing practices have been modified. Other threats to dugongs, such as Indigenous hunting, illegal hunting and netting, and loss of seagrass, are also being addressed. For example, action is under way to involve Aboriginal and Torres Strait Islander communities more directly in the management of dugongs. Additional resources are being provided to enhance education, surveillance and enforcement in the Great Barrier Reef.

Dugongs are recognised as one of the values for which the Great Barrier Reef was World Heritage listed and Australia therefore has an international responsibility to protect dugongs. Australia has created the world's first system of protected areas designated specifically for the conservation of dugongs.

The creation of the DPAs was based upon the best available scientific evidence and included independent analysis by an advisory group reporting direct to the Ministerial Council. Every effort was made to minimise the impact on the commercial fishing industry, including the provision of *ex gratia* payments to fishermen affected by the decision. In addition, funds were provided to buy back active licences that operated in the Dugong Protection Areas. The Ministerial Council, on the basis of advice from an Independent Assessment Panel, approved these payments. The participation of scientific experts, Indigenous groups and key stakeholders such as the fishing industry was valuable.

The Queensland and Commonwealth governments work closely together to implement an effective and responsible strategy to save dugongs. The Ministerial Council is committed to ongoing review of the effectiveness of its actions for dugong conservation. Subsequent reviews occurred in 1999 and 2001 and as a result several additional actions were undertaken. Another review is due in 2003.





# **Actions for dugong conservation**

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**A**ction is underway to prevent a further decline in dugong numbers in the southern Great Barrier Reef. The threats are being tackled in a systematic and coordinated way that will not only benefit dugongs and their habitat but also the health of the marine environment.

The Great Barrier Reef Marine Park Authority (the GBRMPA) is working with various management agencies including the Queensland Parks and Wildlife Service (QPWS), Environment Australia, the Queensland Department of Primary Industries – Fisheries Division (QDPI) and interest groups including local governments, Indigenous peoples, commercial and recreational fishers, conservation groups and local communities.

## ***Actions by government agencies and interest groups***

### **1. Dugong Protection Areas and Mesh Netting**

- A system of 16 Dugong Protection Areas (DPAs) has been established to protect key dugong populations and habitats in the southern Great Barrier Reef, south of Cooktown, and Hervey Bay. Fishing with mesh nets is banned from many of the DPAs and modified in the others (For more information on DPAs and a map of their locations see the sheet 'Dugong Protection Areas and mesh netting').

### **2. Fisheries**

- Mesh netting is banned or restricted in DPAs.
- Fishery management plans under development by QDPI will incorporate measures to protect dugongs.
- An Endangered Species Awareness Course has been set up and over 300 commercial fishers have undertaken the course.
- A Code of Practice has been adopted by the commercial fishing industry to minimise fishing impacts on dugongs.

### **3. Indigenous Management**

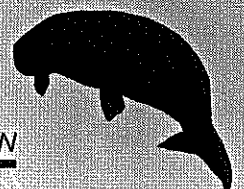
- A number of Indigenous groups in coastal Queensland have agreed to a moratorium on the hunting of dugongs in their local areas.
- Cooperative management arrangements are being developed with Indigenous people for the conservation and management of dugongs in the Great Barrier Reef World Heritage Area.
- Permits to hunt dugongs are no longer being granted for the southern Great Barrier Reef while dugong numbers are critically low.
- The GBRMPA's Indigenous Policy and Liaison Unit supports communities through information and education programs on dugong conservation.
- Indigenous knowledge of dugong biology is being sought.
- Research results regarding dugongs are being communicated to Indigenous groups.

### **4. Shark-meshing**

- The shark control program has been reviewed by QDPI and a number of nets have been replaced with drumlines. The GBRMPA is seeking removal of the remaining 10 shark-meshing nets in the World Heritage Area and their replacement with baited drum lines.

### **5. Boat Strikes**

- Boat speed restrictions of 40 knots have been re-applied in dugong habitat areas of the Hinchinbrook area, and further voluntary speed restrictions are being advocated in areas of particular sensitivity.



## **Actions for dugong conservation**

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- The Hinchinbrook Local Marine Advisory Committee, in conjunction with the GBRMPA, has produced several boat ramp signs aimed at reducing the risk of dugong collisions.
- An education campaign has been implemented including television advertising urging boaters to reduce speeds in shallow waters.
- Best Environment Practices have been promoted to boat users.
- A Code of Practice has been adopted by the peak recreational fishing group to minimise boat strikes.
- A brochure highlighting Wildlife Friendly Boating practices has been developed.

### **6. Illegal Activity**

- Surveillance and enforcement have been increased to prevent illegal fish netting and hunting.

### **7. Defence Activities**

- The Department of Defence has reviewed its use of high explosives and is developing environmental management plans for Defence Training Areas in the Great Barrier Reef World Heritage Area. The Department of Defence instituted a moratorium during 1997 on the use of high explosives in Dugong Protection Areas except in the Shoalwater Bay Military Training Area and in 2001 ceased the use of high explosives in the Halifax Bay Defence Practice Area, near Townsville.
- The Department of Defence is funding research into the effects of its activities on dugongs and has put in place measures aimed at ensuring their activities do not threaten the animals.

### **8. Research in Progress or Recently Completed (much of the research has been funded by GBRMPA)**

- Dugong distribution and abundance in Queensland (James Cook University).
- Dugong distribution and abundance and the assessment of boat strikes in the Hinchinbrook area (James Cook University).
- Distribution and abundance of seagrass in Dugong Protection Areas (QDPI).
- Boat traffic patterns in the Hinchinbrook Area (James Cook University).
- Dugong mortality in Queensland: a database (GBRMPA and QPWS).
- Genetics of dugongs along east coast of Queensland (James Cook University).
- Carcass Recovery Program and Marine Wildlife Hotline (QPWS and GBRMPA).
- Assessment of metals and pesticides in seagrasses, sediments and dugong carcasses (GBRMPA).
- Underwater acoustics monitoring and aerial monitoring in Shoalwater Bay, and auditory physiology (Department of Defence).
- Dugong research and monitoring program to direct dugong research for the next 2 to 3 years (community groups, scientific organisations, GBRMPA and relevant stakeholders).

### **9. Coordination and Planning**

- A plan of management for dugong in Shoalwater Bay was finalised in 1997.
- Plans of management for the Cairns Area and the Whitsundays also have been finalised and prohibit people from taking or interfering with a dugong.
- A draft management plan for the Hinchinbrook Area was released in 2001.

### **10. Education and Information**

- A comprehensive education and information program is being undertaken to enhance public awareness of the value and plight of dugongs, and how the public can assist. The program includes information kits, media releases, television advertising, reef user workshops and liaison with advisory committees and interest groups.





EPA Hotline

# **URGENT**

Please report any  
injured or dead  
dugongs, turtles  
whales or  
dolphins by  
phoning the

**EPA  
HOTLINE**

**1300 130 372**

(FOR THE COST OF A LOCAL CALL)

**Report immediately for maximum  
chance of recovery and  
benefit to species  
management and science**

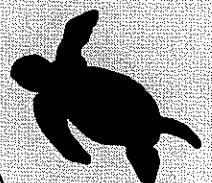
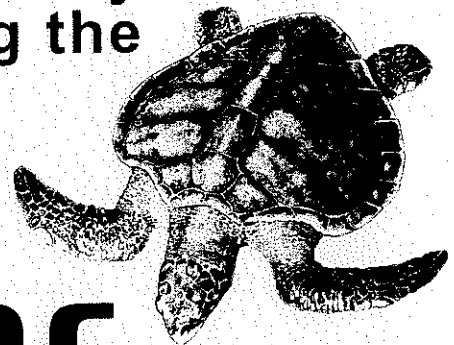


Australian Government  
Great Barrier Reef  
Marine Park Authority



Queensland Government  
Environmental Protection Agency  
Queensland Parks and Wildlife Service

Great Barrier Reef Marine Park Authority - **TURTLE INFORMATION**



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# URGENT

Please report any  
injured or dead  
hedgehogs, turtles or  
whales or  
dolphins by  
calling the

# WILDLIFE HOTLINE

1-800-368-3273

(FOR THE COST OF A LOCAL CALL)

Report immediately for assistance  
in case of recovery and  
care of injured  
animals and diseases

WILDLIFE  
HOTLINE

Only report dead marine mammals, turtles, birds, and fish.

# Dugong Protection Areas and mesh netting

**E**mergency measures to save dugongs in the southern Great Barrier Reef and Hervey Bay, were announced by the Federal and Queensland Governments in August 1997. Central to these measures was the establishment of a system of 16 dugong protection areas (DPAs) in these areas. The DPAs were declared in legislation under the *Queensland Nature Conservation Act 1992* and *Queensland Fisheries Act 1994*.

The establishment of DPAs was a critical step in efforts to save the dugong. The dugong is recognised as one of the values for which the Great Barrier Reef was World Heritage listed. Australia therefore has an international responsibility to protect the dugong and has created the world's first system of protected areas specifically for the conservation of dugong.

The decisions by the Great Barrier Reef Ministerial Council were guided by the best available science, providing renewed confidence that the decline in dugong numbers can be reversed. The relevant scientific evidence was assessed by an independent chair and an advisory group comprising Commonwealth and Queensland officials, eminent scientists and representatives of the commercial fishing industry. The advisory group established three Working Groups to assist in determining, separately:

- the appropriateness of nets and netting practices;
- scientific information pertaining to seagrass distribution, dugong distribution and dugong genetics; and
- payments and adjustment to commercial fishers.

## Fishing restrictions

Following the independent review of scientific information and developments of proposals for payments to affected fishers, the Great Barrier Reef Ministerial Council announced various restrictions on mesh netting. The restrictions were implemented on 12 January 1998 under the *Queensland Fisheries Act 1994*. For details of all fishing regulations refer to the *Queensland Fisheries Regulations 1995*.

## Mesh netting restrictions

Two types of protection areas were agreed by the Ministers - Zone 'A' and Zone 'B'.

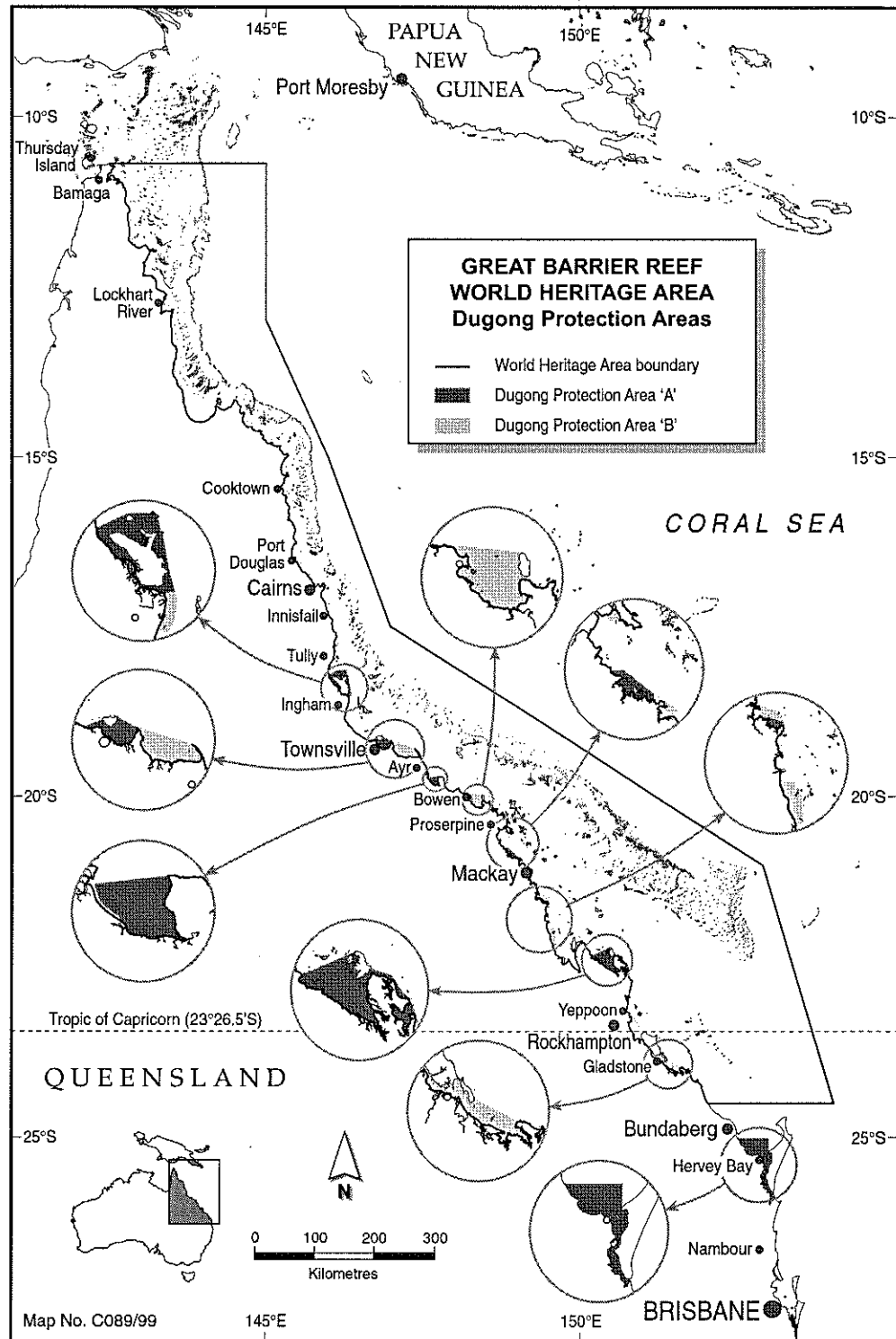
Zone 'A' dugong protection areas (DPAs) include significant dugong habitats in the southern Great Barrier Reef (consistently contain over 50% of dugong numbers). In these areas, the use of offshore set, foreshore set and drift nets are prohibited, except in Hervey Bay and Great Sandy Strait protection area where specialised fish netting practises are allowed to continue with modifications. The use of river set nets are allowed with modifications in Zone 'A' DPAs, except in two key areas where river set nets are prohibited (Hinchinbrook and Shoalwater Bay DPAs). Other netting practices such as ring, seine, tunnel and set pocket netting which are not considered to pose a serious threat to dugong are unaffected.

In Zone 'B' DPAs mesh netting practices are allowed to continue, but with more rigorous safeguards and restrictions than before. Zone 'B' DPAs have been shown to contain about 22% of dugongs in the southern Great Barrier Reef. These measures are being kept under review to ensure protection of dugongs in these areas.

Local Queensland Boating and Fisheries Patrol offices should be contacted for more information.



# Dugong Protection Areas and mesh netting



## The DPAs

### Zone 'A' DPAs

Hinchinbrook  
Cleveland Bay  
Upstart Bay  
Newry region  
Ince Bay  
Shoalwater Bay and Port Clinton  
Hervey Bay-Great Sandy Strait

### Zone 'B' DPAs

Taylors Beach  
Bowling Green Bay  
Edgecumbe Bay  
Repulse Bay  
Sand Bay  
Llewellyn Bay  
Clairview region  
Rodds Bay



# Working together to protect dugongs in Shoalwater Bay: A CASE STUDY

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**S**hoalwater Bay is a large, remote estuarine area approximately 50 kilometres north of Rockhampton in central Queensland. It is renowned for its outstanding biological diversity and for this reason it has been listed as part of the Great Barrier Reef World Heritage Area, as a Wetland of International Importance under the Ramsar Convention, on Australia's Register of the National Estate and as a Dugong Protection Area. It is also a significant habitat of migratory shorebirds listed under two international treaties: the Japan Australia Migratory Birds Agreement (JAMBA) and the China Australia Migratory Birds Agreement (CAMBA). Because of the Bay's scientific significance, the Great Barrier Reef Marine Park Authority has instituted special arrangements for the management of its dugong population.

## ***Significance to wildlife***

Over one-third of the Bay is shallow, open water that supports the most extensive seagrass meadows south of Cooktown and the largest dugong population in the southern Great Barrier Reef.

Apart from its importance to dugongs, Shoalwater Bay is significant to a wide range of flora and fauna. For instance, it provides habitat for 226 species of birds. This represents 32 per cent of Australia's avian fauna in less than one per cent of the Australian continent. In particular, it is an important habitat for a large number of migratory shorebirds and supports populations of up to 20 000 waterbirds.

The Bay is also a habitat for the largest residential population of green turtles on the east coast of Australia.

## ***Human use of Shoalwater Bay***

The main human uses of Shoalwater Bay are defence operations, commercial fishing and scientific study. Recreational boaters and fishers also visit the Bay.

The Bay is part of the territory of the Darumbal-Noolar Murree Aboriginal language group.

## ***Threats to dugongs in Shoalwater Bay***

Aerial survey estimates suggest that the population of dugongs in the Bay declined significantly between 1986/87 and 1994 and in 1999 had returned to levels recorded in 1986/87 (see sheet on 'Declining Dugongs' to place the rise in context).

A significant cause of the decline was the accidental capture of dugongs in certain types of mesh nets.

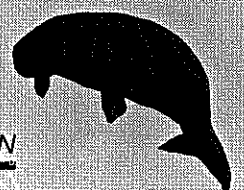
The GBRMPA prepared and implemented a Plan of Management for Shoalwater Bay that is intended to stop the population decline.

The aim is to reduce non-natural mortality of dugongs to below one percent of the existing population. Considerable and encouraging progress has been made in cooperation with major stakeholders and the following outcomes have been achieved.

## ***Mesh netting***

The fishing industry shares the GBRMPA's concern about the accidental capture of dugongs in mesh nets and supported a ban in Shoalwater Bay on set foreshore and offshore mesh nets under Queensland fisheries legislation.

Following consideration by the Great Barrier Reef Ministerial Council, a ban on the carriage and use of all nets that threaten dugongs in Shoalwater Bay has been implemented. Only cast nets are now allowed in the Bay.



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## **Defence operations**

The GBRMPA and the Department of Defence have agreed that all underwater detonation activities will cease in important seagrass meadows identified around Triangular Island in Shoalwater Bay.

The Department of Defence is also urgently reviewing its use of high explosives and other military operations, and is developing an environmental management plan for marine areas in the Bay.

## **Indigenous hunting**

The Darumbal-Noolar Murree Corporation for Land and Culture, which represents the traditional custodians of Shoalwater Bay, has agreed with the GBRMPA that it would be inappropriate to hunt dugongs in the Bay for the time being.

## **Research and monitoring**

Extensive research into the flora and fauna of the terrestrial and marine environment has been undertaken in recent years.

In relation to the study of dugongs and their habitat, a major survey of the seagrass meadows covering 126 square kilometres of the Bay (including Port Clinton) has been conducted to establish the extent, composition and condition of the meadows. Key findings were that seagrasses in the area cover about 13 000 ha of mainly intertidal substrate. The area's subtidal grass is small due to strong currents and associated high water turbidity that limits light penetration. The report, *Seagrass Communities in the Shoalwater Bay Region, Queensland Spring (September) 1995 and Autumn (April) 1996, Research Publication No. 44*, is available from the Great Barrier Reef Marine Park Authority. Monitoring sites have been established in several seagrass meadows, including those around Triangular Island.

The movement of several dugongs within the Bay has been studied through the use of satellite transmitter devices attached to their tails. This research has provided valuable insights into aspects such as: the distances travelled by individual dugongs; their use of rivers, creeks and intertidal areas of the Bay; their duration of dives; and the depths at which they feed.

Studies by the Department of Defence have established safety ranges for dugongs and other animals during the use of explosives at Triangular Island.

## **Management actions**

Surveillance, enforcement and other management activities have been enhanced in cooperation with the Queensland Boating and Fisheries Patrol, Queensland Parks and Wildlife Service, and the Department of Defence.

