

RECOMMENDATIONS FOR BOAT TRAFFIC MANAGEMENT IN THE HINCHINBROOK DUGONG PROTECTION AREA

Goal

To allow for reasonable recreational and commercial boating in the Hinchinbrook Dugong Protection Area (DPA) while maintaining the area as high quality dugong habitat.

Strategies

1. To increase awareness of boat users of the importance of maintaining the Hinchinbrook DPA as high quality dugong habitat.
2. To manage boating activities primarily within a framework of Boating Management Areas which are delineated on the basis of their existing use by boaters, their importance for dugongs, and localised factors (such as water depth) that may moderate or exacerbate the effects of boat traffic.

Recommendations

1. Develop an education and awareness program to:

- (i) foster an appreciation by boaters of the significance of the Hinchinbrook Dugong Protection Area, and the threats posed to dugongs by boats;*
- (ii) encourage boaters to travel slowly and cautiously in shallow areas, or areas known to support seagrass or dugongs; to use marked channels where possible; and to comply with boating regulations.*

Rationale: The management of boating activity in the Hinchinbrook area will depend to a large extent on voluntary compliance with regulations. Such compliance will require an appreciation of the need for the regulations, which will require an education and awareness program.

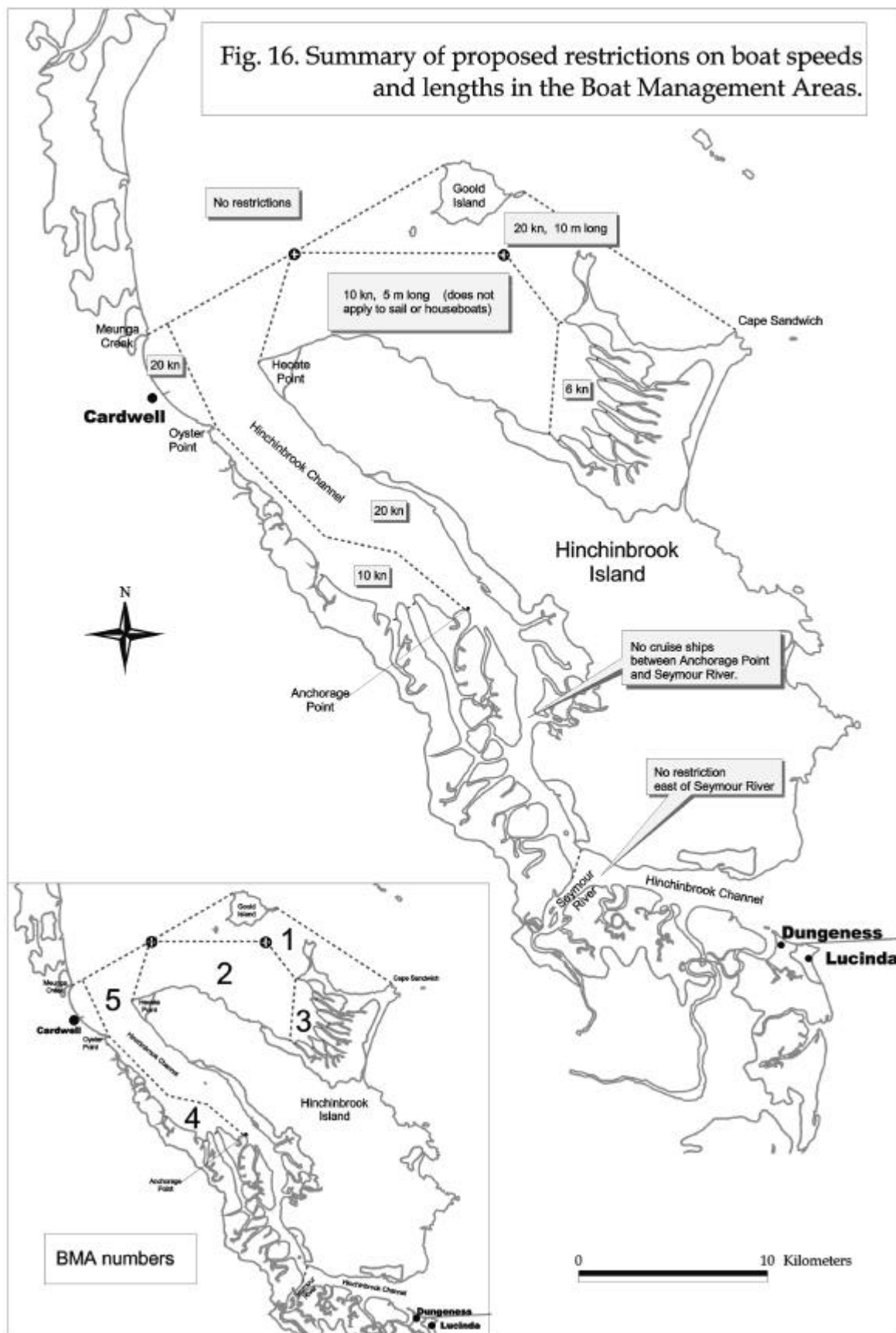
2. Establish five Boating Management Areas (BMAs) within the Hinchinbrook Dugong Protection Area for the regulation of boating activity.

It would be preferable not to superimpose another zoning scheme on top of the existing management regimes established by Great Barrier Reef and Queensland Marine Parks zones, Fish Habitat Areas and fisheries closures that operate in the Hinchinbrook area. However, the spatial scale of the patterns of dugong and boater use of this area means that it is necessary to implement a boating management regime that reflects the dugongs' usage of the area. The proposed Boating Management Areas are derived from the existing use of different areas by dugongs and boats, factors that affect the potential threat to dugongs from boats, and consideration of future patterns of boat use.

Boating Management Area 1

Location: Northern Missionary Bay (including Garden and Goold Islands) and Shepherd Bay (figure 16). Southern boundary marked by a line joining a point just west of Macushla (on Hinchinbrook Island) and two or more buoys in Missionary Bay (located at 18.20° S, 146.09° E, and 18.20° S, 146.19° E).

Suggested activities allowed: Small- to medium-sized (< 10 m) recreational and commercial craft (including current passenger ferry services) that travel at high speeds can use this BMA to access the Cape Richards resort, Macushla, Missionary Bay creeks and destinations east of Missionary Bay (Brook Islands, eastern Hinchinbrook, offshore reefs). Maximum speed limit of 20 kn. No restrictions on the use of sailing craft, houseboats or smaller displacement-hulled boats (< 10 m). Commercial passenger ferries allowed under permit.



Suggested changes to existing use: Large (> 10 m) seagoing displacement-hulled vessels, such as trawlers, not permitted in this BMA, except for anchoring behind Cape Sandwich, Cape Richards and Goold Island, or for transit during exceptional weather events.

Suggested restrictions on possible future use: Large fast vessels, such as those used to take tourists to

the reef (e.g. wave-piercers, fast cats) not permitted in this BMA. Such boats should be directed north of Goold Island.

Rationale:

Location: The proposed positions of the marker buoys, and hence the southern boundary to this BMA, is a balance between the perceived need for an acceptably direct path for boats to traverse Missionary Bay and the need to direct boat traffic away from important dugong habitat. The area of this BMA to the southwest of Goold Island, which is heavily used by dugongs (figure 4b), will be subjected to greater boat traffic in an effort to protect the areas of greatest dugong concentration to the south and southeast (in BMAs 2 and 3). The relatively northern location of the buoys ensures that the larger and faster craft that use BMA 1 will stay in relatively deep water, where dugongs will be better able to avoid approaching boats.

Speed and size restrictions: The 10 m and 20 kn restrictions are a balance between the reasonable use of the area and the risk of fatal boat strike and noise disturbance. The faster a boat travels, the less time is available for a dugong to take evasive action, and generally, the amount of underwater noise generated increases with speed (McCauley et al. 1996). These restrictions will have little impact on existing use because: (i) few boats that currently transit Missionary Bay would exceed 20 kn under most weather conditions, and (ii) the vast majority of recreational craft that use this area are < 10 m long. One of the three commercial ferries currently operating to northern Hinchinbrook Island is 12 m long, and an exception to the 10 m limit could be made, perhaps with a sunset clause ending with the disuse of this vessel.

Excluding reef cats: Large passenger ferries of the type used to access the reef are likely to represent a high risk to dugongs and turtles. These boats are very fast, have large, deep propellers and have a large footprint. Consequently, they have the characteristics of craft that are likely to represent a significant boat-strike threat (Wright et al. 1995). The faster the boat and the larger its potential area of impact, the smaller the chance that dugongs or other wildlife could make evasive movements. Furthermore, this type of boat generates high levels of underwater noise (McCauley et al. 1996), which may degrade the habitat in this area for acoustic species such as dugongs and cetaceans (Anderson and Barclay 1995; Richardson et al. 1995; Norris 1994). These boats are designed for use in open waters and can avoid Missionary Bay.

Restrictions on trawlers: Trawlers, and similar vessels should be allowed to anchor behind Cape Sandwich, Cape Richards and Goold Island, as they currently do. They would also be able to pass through BMA 1 for safety reasons during exceptional weather events. Under normal circumstances, however, trawlers have no need to pass through Missionary Bay because they are very seaworthy and because current GBRMP zoning prohibits trawling within Missionary Bay. Current GBRMPA zoning does allow trawling on the seagrass meadows of Shepherd Bay. The importance of Shepherd Bay for dugongs has only been discovered as a result of the current project. Hence, I suggest that Shepherd Bay should be rezoned to prohibit trawling. This would ensure the protection of the seagrass meadows as dugong, turtle, prawn and fish habitat

Boating Management Area 2

Location: The area of Missionary Bay south of a line joining Hecate Point, the permanent buoys (located at 18.20° S, 146.09° E, and 18.20° S, 146.19° E) and Macushla (figure 16).

Suggested activities allowed: All motor vessels < 5 m long permitted. All houseboats and sailing boats permitted. Speed restriction of 10 kn to apply to all vessels. Under adverse weather conditions motor boats < 10 m long could transit this BMA as long as they comply with the speed limit or maintain the minimum safe speed for control of the vessel (additional conditions should apply to some commercial vessels - see below).

Suggested changes to existing use: Motor vessels greater than 5 m long (excluding houseboats) prohibited from this area. These vessels should use BMA 1.

Rationale:

Speed and size restrictions: This BMA contains most of the habitat that is most heavily used by dugongs (figure 15). Seagrass covers nearly all of this BMA (and extends further to the north than indicated in recent maps by Lee Long et al. 1998; personal observation). Most of this BMA is less than 3 m deep. High-speed boats travelling over seagrass beds, especially in shallow areas, are likely to pose the greatest threat to dugongs. The suggested regime for BMA 2 allows the passage of most recreational and commercial fishing craft, but requires these vessels to travel at reduced speeds, for the protection of wildlife. Vessels larger than 5 m, or those wishing to travel at greater speeds can choose to travel through BMA 1.

Safety provision: Human safety is of paramount importance, so it is necessary to allow for the transit of BMA 2 under adverse weather conditions. However, observations suggest that dugongs' ability to detect an approaching powerboat decreases as wave height increases, presumably due to the increase in ambient noise levels. Consequently, I suggest that larger vessels that choose to transit this BMA for safety reasons must comply with the speed restrictions. To prevent abuse of this safety provision, I suggest that there should be a sunset clause on the transit of this area by commercial ferries. These vessels should be seaworthy enough not to need to transit BMA 2 (except under exceptional circumstances), and the sunset clause would allow for eventual upgrading of these vessels, if required.

Boating Management Area 3

Location: The area of Missionary Bay south and east of Macushla, including the mouths of the major creeks (figure 16).

Suggested activities allowed: This area is accessible to all sailing boats and all other boats < 15 m long. Larger displacement-hulled vessels, such as some commercial and research vessels should be allowed under permit. All boats restricted to a maximum speed of 6 kn. Boats restricted from BMA 2 would enter this area from BMA 1, near Macushla (figure 16).

Suggested changes to existing use: No current users would be prevented from accessing the Missionary Bay creeks.

Rationale: This BMA is designed to provide access to the Missionary Bay creeks by all users. Because of the shallowness of many areas in this BMA, the importance of this area to dugongs, and the access provided for large boats, the speed of craft should be kept < 6 kn.

Boating Management Area 4

Location: The nearshore waters of northern Hinchinbrook Channel between Meunga Creek and Anchorage Point, along the mainland coast (figure 16).

Suggested activities allowed: Virtually all current boat use would continue. North of Oyster Point the maximum boat speed should be 20 kn. South of Oyster Point the maximum boat speed should be 10 kn.

Suggested changes to existing or future use: The 10 kn speed restriction south of Oyster Point will affect commercial crab fishers that set their pots in this area, as they generally travel at higher speeds.

Restrictions on possible future use: Water skiing, parasailing and the use of jet skis should be prohibited between Meunga Creek and Oyster Point to preserve the habitat quality of this dugong grazing area.

Rationale:

Restrictions around Cardwell: The seagrass meadow off the Cardwell foreshore is the largest in the region outside Missionary and Shepherd Bays (Lee Long et al. 1998) and the species of seagrasses that make up this meadow are particularly favoured by dugongs. Dugongs are regularly seen in this area (I have seen herds of 12, 20 and approximately 100), and the extent of feeding trails indicates that it is an important feeding ground for dugongs. Due to the high public profile of dugongs,

and the difficulty of seeing them in most areas, Cardwell has considerable potential to capitalise on the proximity of dugongs to its beach, jetty and boat ramps. To realise this potential, however, the nearshore seagrass meadow must be maintained as a favoured grazing area.

The current pattern and intensity of boat traffic around Cardwell does not appear to be having an adverse effect on the dugongs. This is probably because the nature of the traffic through this area. Most of the boat traffic passes through a limited number of corridors - predominantly from the boat ramp and jetty out towards Missionary Bay/Goold Island, or south into Hinchinbrook Channel. As a result, these movements pass at right angles to the north-south oriented feeding area. Most other boat movements are those of tender vessels moving between the jetty and moored vessels. These are small vessels, and many of them are rowed.

The apparent benign nature of current traffic does not mean that regulation of boating activity is not required. The future introduction of jet skis, water skiing, parasailing and other boating activities have the potential to make this area unsuitable dugong habitat. These types of boating activities are more likely to run parallel to the shore, and thus through the length of the feeding area. In the case of jet skis, they can also operate in the nearshore shallow waters that deter other boats.

Speed limit south of Oyster Point: The seagrass beds and adjacent waters between Oyster Point and Anchorage Point were used extensively by tracked dugongs. They were also the area of greatest dugong abundance during Heinsohn's aerial surveys between 1974 and 1981. Many of the seagrass beds in this area occur very close to the mangrove-lined shore (Lee Long et al. 1998). The boats of commercial crab fishers transit this narrow zone up to several times each day, on the high tide, and this disturbance may displace the dugongs from these grazing areas. The crab boats, which travel quickly between pots, also pose a threat to green turtles that graze these seagrass beds. The 10 kn speed limit over the seagrass meadows and adjacent habitat between Oyster Point and Anchorage Point will reduce the risk of boat strike and is likely to reduce the risk of habitat alienation. Crab fishers will be able to operate in the area, but they will have to travel at slower speeds along this section of the coast. There will be no restrictions on the activities of crab fishers in any other part of the channel.

Boating Management Area 5

Location: Hinchinbrook Channel north of the Seymour River (figure 16)

Suggested activities allowed: All current recreational boating, except boat and ski races, should be allowed. All current commercial boating will be permitted, although the access of cruise ships should be limited. A maximum boat speed of 20 kn should apply to all vessels (except reef fast cats).

Suggested changes to existing use: Cruise ships should not be allowed south of Anchorage Point, or north of the Seymour River. Boat and ski races should be restricted to the southern channel, east of the Seymour River. However, the Great Barrier Reef Marine Park Authority Ministerial Council has recommended to the State Government that no permits for ski boat races should be granted for ski races in this area.

Suggested restrictions on possible future use: Reef fast cats that may operate between 'Port Hinchinbrook' or Cardwell and the reef should be restricted to 15 kn through this BMA.

Rationale:

Speed limits: Dugongs (and dolphins and turtles) occur throughout all areas of the Hinchinbrook Channel. The faster vessels travel, the less time available for wildlife to take evasive action. An appropriate balance between reasonable boat use and conservation requires some restriction on boat speeds. An upper limit of 20 kn would have no affect on the overwhelming majority of boat users.

Due to their large footprints and large deep propellers, fast cats and similar craft operating to the reef should be required to travel at 15 kn within this BMA, to minimise the risk of boat strike.

Speed boat races limited to the southern channel: Racing speedboats travel at very high

speeds (up to 70 kn; Burnham 1993 in Gilbert and Benzaken 1996) and pose a threat to a variety of wildlife. The middle one-third of Hinchinbrook Channel, between the mouth of the Seymour River and Anchorage Point (figure 16) is particularly narrow. In some locations it is less than 500 m from bank to bank. In this 16 km long section of the channel, both wildlife and the racing boats are particularly constrained, and the likelihood of boat strike or disturbance due to noise levels is increased.

It has been reported that about nine boat races are currently conducted through the channel each year. The one race I witnessed involved 20 boats. As the races involve a return journey from the southern to the northern end of the channel, this race involved 40 high speed passes of the full length of the channel. In the US, episodic periods of high levels of boat traffic have been associated with propeller injuries to dolphins (Wells & Scott 1997). As dolphins are distinctly faster and more agile than dugongs, the risks from such concentrated and fast boat traffic would be expected to be significantly greater for dugongs. In Florida, fast small- to medium-sized speedboats, presumably like those used for races in Hinchinbrook Channel, account for most of the fatal manatee injuries caused by boats (Wright et al. 1995).

Although the largely single-file nature of racing boats limits their impact to a relatively narrow band, this does not necessarily reduce their potential threat to dugongs. The way dugongs respond to a passing speedboat may make them more vulnerable to being struck by a following boat. I have observed fast speedboats (travelling at approximately 20 kn) pass through groups of dugong in water 4–5 m deep. Typically, the dugongs dived as the boat approached and surfaced shortly afterwards in its wake. When Anderson (1981) drove a fast speedboat (27 kn) through a group of dugongs (probably in approximately 3 m water) the dugongs took no evasive action, but aggregated after the boat had passed. *'If a second boat had been following close behind, the response of the dugongs would have increased the risk of collision rather than reducing it'* (Anderson 1981, p. 643).

Prohibiting speed boat races from BMA 5 will limit this activity to that section of the Hinchinbrook Channel between Lucinda and the mouth of Seymour River. Dugongs' use of this section of the channel has been confirmed by numerous sightings reported by the public and the transit of this area by at least one tagged dugong. However, dugongs now appear to be less common here than they were in the 1970s, and compared with the rest of the channel, this area now has a relatively low abundance of dugongs. Consequently, if boat and ski races were to occur in the channel, this would be the most appropriate location. The area provides a loop circuit of 25 km length, has a relatively deep channel and includes the start/end location for the current boat races.

The alternatives to restricting boat races to the southern channel are either: (i) allowing boat races to continue at the current frequency and number of participants, or (ii) banning races in all of the channel. Given the status of Hinchinbrook Channel, as a Zone A Dugong Protection Area, and being aware of the very confined nature of the middle one third of the channel, it is difficult to mount a credible case for the support the first option. Accepting that the races are an existing (but controversial) use and constitute an important form of recreation for a segment of the local community, it may be unrealistic to expect the complete banning of the races in Hinchinbrook Channel. The compromise that has been suggested should maintain the integrity of that part of the channel that is most important to dugongs, while allowing races to continue throughout nearly one third of the channel's length.

Cruise ships not permitted to transit the narrow section of the channel between the Seymour River and Anchorage Point: Very large boats in the narrow channel pose a threat to wildlife. In Florida, most fatal propeller wounds to manatees are caused by medium sized and larger vessels because they have large propellers that cut deeply (Wright et al. 1995). In some areas slow-moving vessels, like tugs, have had to fit specially designed propeller guards. The central one third of the channel is unsuitable for the passage of cruise ships because of the threat posed by their very large propellers and because of the level of underwater noise that they would generate. In the narrow, shallow sections of the channel, this noise is likely to be amplified by reflection. Cruise ships would not be restricted from entering the northern and southern sections of the channel.

Additional Recommendations

3. Install channel markers in the northern end of Hinchinbrook Channel to encourage boaters to use

a single corridor down the channel.

Rationale : Dugongs and dolphins occur throughout the northern channel and the level of boat disturbance could be reduced if boats were focussed within a narrower corridor. At present there is no marked channel in the northern area, so boat traffic is dispersed. Racing sailboats can reach moderate speeds (up to 15 kn) and many (especially catamarans) will use shallow waters when tacking. A marked channel could be used to restrict racing sailboats to deeper water.

4. Require boat-based commercial dugong watching to operate under a permit system.

Rationale : Commercial dugong watching is conducted in Missionary Bay. Current practice is unregulated and involves significant risk to dugongs due to the high speed approach to and departure from the dugongs, and due to the types of vessels used. Any commercial dugong watching should be regulated by permit, and guidelines should be developed for boat-based dugong watching, as has been done for whales.

5. Operators of commercial passenger craft should be required, as a condition of their permit, to report suspected boat strikes to the Queensland Environmental Protection Agency and GBRMPA. Passengers should also be actively encouraged to report suspected strikes.

Rationale : Ongoing management of boat traffic will benefit from a knowledge of boat strike incidents. The Author's experience to date indicates that few boaters report strikes of dugongs or turtles. Some boat strikes involving the commercial vessels in the Hinchinbrook area have been reported by passengers, although it is likely that most strikes have gone unreported. Commercial passenger craft could be required to display a poster providing information about dugongs in the area and requesting passengers to report suspected strikes. If passengers know to report boat-strike incidents, it is likely that most boat strikes by commercial passenger vessels will be reported. As two passenger ferry services account for 15% of all boat traffic in Missionary Bay, and these ferries are the type of craft most likely to cause fatal strikes, significant benefits may be achieved by having educated and vigilant passengers.

6. The boat traffic management plan should be reviewed at set intervals.

Rationale : The nature and intensity of boat traffic within the Hinchinbrook DPA will change through time. Not all these changes can be predicted. Consequently the boat traffic management plan should be reviewed at set intervals. Possible issues that have not been addressed in these recommendations, and that may require examination in the future include:

- (1) The need to establish a cap on boat numbers operating in some areas.
- (2) The effect of directing all the fast boat traffic through restricted area between BMA 2 and Garden Island. This area is not very deep (mostly < 4 m) and is often used by dugongs. A 'Go slow' zone may be required here.
- (3) The impacts of jet ski and water ski activity around Garden Island and the western shore of Goold Island.
- (4) The impacts of boat races on dolphins, turtles and dugongs in the southern channel.
- (5) The possible need for propeller guards and additional speed limits on some commercial vessels, such as sightseeing cruises, that will transit the area regularly and may constitute a significant proportion of channel boat traffic.
- (6) The possible need for some vessel-free areas.
- (7) The need for additional resources to allow adequate enforcement of boating management regulations.
- (8) Further restrictions in some areas if current use patterns changed significantly (e.g. if the boat ramp at Meunga Creek was upgraded and this area became a popular launching facility).