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Hinchinbrook Area Boater's Opinions Of and Compliance With Dugong Conservation Initiatives

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Image by GBRMPA

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Abstract

Taking into consideration past history of the area this report aims to examine the views of Hinchinbrook Area boaters and fishermen regarding conservation initiatives and indigenous hunting. A combination of surveying local boaters using a questionnaire and interviews conducted with local experts and people involved in dugong conservation resulted in both numeric results and many personal opinions.

Conservation initiatives include voluntary speed guidelines, voluntary transit lanes, and a Traditional Use of Marine Resource Agreement. Boaters' opinions and compliance with all the initiatives was examined using a questionnaire which included a True or False section, personal opinions, compliance, and sighting information. While knowledge of transit lanes and Native Title hunting legislation was found to be high, knowledge of the TUMRA and speed guidelines was found to be lower. General compliance with guidelines and transit lanes was found to be low especially among frequent users of the Hinchinbrook area. Unsolicited comments were also taken into consideration when evaluating respondent's opinions on indigenous hunting as well as the management of the Hinchinbrook waterways.

Interviews were mainly used in the examination of possibilities for future management and advertising of current initiatives, the creation of a community based conservation group and the possibly for altering current educational programs.

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Thank you to John Winters for answering questions about the Tree-Kangaroo and Mammal group, his former community survey in the Atherton tablelands, and the feasibility of starting a similar group or conducting a similar survey in the Cardwell area.
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Chapter 1. Introduction

The conservation of dugongs (*Dugong dugon*) is important because they are the last extant species of the family Dugongidae and the only sirenian living in the waters surrounding Australia (Bryden et al., 1998). Dugongs' range extends from about 26° to 27° North and South of the Equator in the Indo-West Pacific (Bryden et al., 1998) (Figure 1). Australian dugong distribution extends from Shark bay on the West Coast around the north of Australia down to Morton bay on the east coast (Figure 1) an area which supports an estimated 85,000 dugongs (Marsh et al 2002). Dugongs are long lived and have a low reproductive rate making them extremely susceptible to anthropogenic impacts within this range (Marsh et al. 2002). The human activities with the greatest impact on dugongs are, indigenous hunting, mesh or shark protection netting, trawling, vessel traffic, and terrestrial runoff (Grech and Marsh 2008).

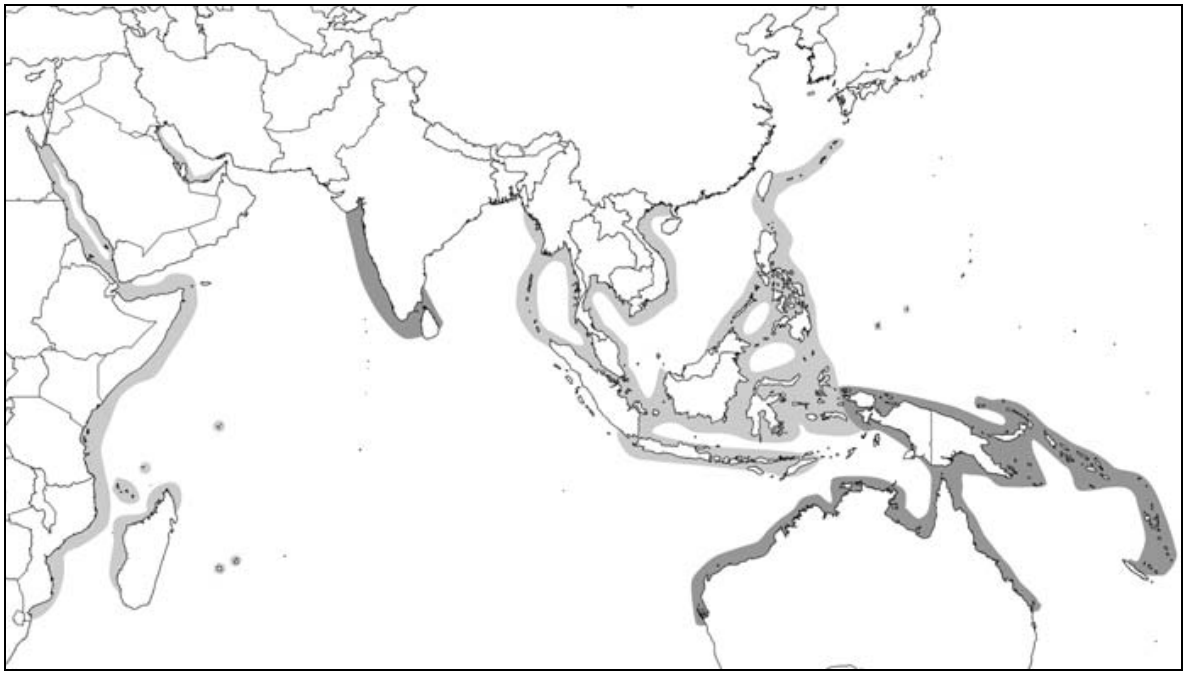

Figure 1. Global distribution of *Dugong dugon.* (Marsh et al 2002)

Dugongs are listed as vulnerable by both the IUCN (2008) and the Queensland Government EPA (2008). They are protected in Australia by the Nature Conservation Act (1992) as well as by a number of agreements with aboriginal groups which ban dugong hunting within each group's traditional country. Additionally the "dugong was one of the reasons for the World Heritage classification of the Great Barrier Reef" (White, 2005).

Within the Hinchinbrook area a Dugong Protection Area (Figure 2) has been established which prohibits mesh and gill netting in the Hinchinbrook waterways (Marsh et al. 2002). A Traditional Use of Marine Resource Agreement has also been developed with the local Aboriginal Corporation which bans all dugong hunting. Lastly the Hinchinbrook Plan of Management establishes voluntary transit lanes and speed guidelines to aid in dugong protection. All of these conservation initiatives have been put in place because of surveys conducted by scientists like Tony Preen (2000) and Helene Marsh (1996) which establish a decline in Australian Dugong populations in the Townsville-Cardwell region since the 1980s and identify the Hinchinbrook area as "one of the most important habitats south of Cape York Peninsula" (Preen, 1997). The estimated dugong population in the Hinchinbrook area according to aerial surveys conducted by Tony Preen in 2000 is 523.3 individuals.

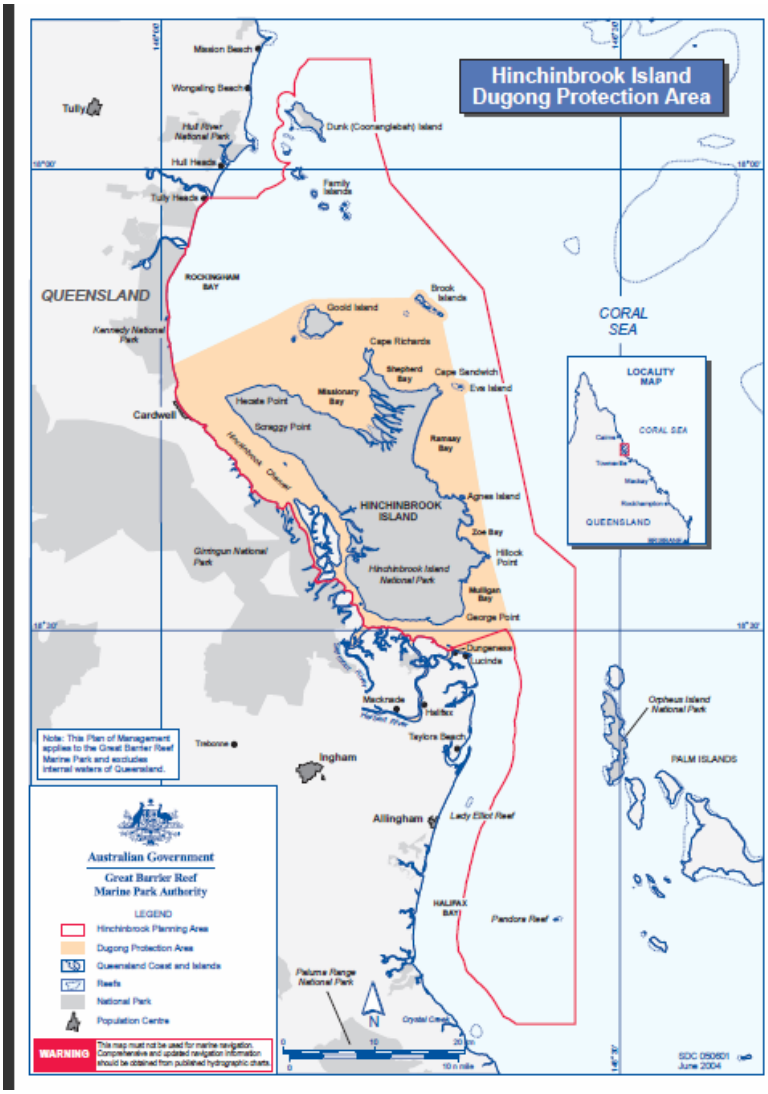

Figure 2. Map of Hinchinbrook Dugong Protection Area.

Section 1.1 Summary of Study Aims

The aim of the following research is to begin to understand the knowledge of dugongs and dugong conservation initiatives among boaters and fishermen in the Hinchinbrook area. Russell Butler is interested in local knowledge and opinions of the TUMRA, as well as perceived increases or decreases in the dugong population by residents. Preen (2000) made a number of suggestions for dugong conservation, some of

which were implemented in the form of voluntary guidelines by GBRMPA. Groom (2003) showed compliance with these guidelines to be so low that they were rendered ineffective. Research by White (2005) revealed views of inequality in regards to the presence of guidelines for dugong conservation in the Hinchinbrook area while dugong hunting was allowed to continue in the north. White states that “this perception of inequality could be quite significant to behavior” (White, 2005) and could influence compliance with local conservation initiatives, a theory that was further explored in this research.

Additionally this research is designed to examine the possibility for creation of a group similar to the Tree Kangaroo and Mammal Group which involves residents in the conservation of local threatened species. The possibility for a full community survey of dugong sightings similar to the one done by John Winter for Tree Kangaroos on the Tablelands was also examined.

Chapter 2. - Study Background

Section 2.1- Risks to Dugongs

Section 2.1.1 - Indigenous Hunting

There is a tradition of dugong hunting in aboriginal communities, that originated prior to European contact, which is now protected by the Native Title Act. Dugongs meat is highly valued and "hunting practices and prowess represent important aspects of Aboriginal and Islander traditions" (Marsh et al. 2004) It is a traditional food and in remote areas of the country such as the Cape York Peninsula and is still part of indigenous people's diet. When asked about the issue of dugong hunting in the north Philip Rist commented that because food in the grocery stores is much more expensive in the more remote areas of Australia indigenous people still hunt dugongs and other native fauna to supplement their diet. Also because of a lack of good jobs some people have started selling dugong meat illegally as a source of income. Methods of hunting and which animals are targeted vary from one tribe to another but many aspects of this traditional activity have changed as "whitefella" culture has been introduced. Dugongs are now commonly hunted from tinnies instead of canoes and may be killed with shotguns instead of spears (Symth, 2006). In order for dugong harvest to remain sustainable, agreements have been reached with some communities limiting dugong take, or banning it all together. The Traditional Use of Marine Resource Agreement is and example of one of these agreements.

The highest level of dugong hunting occurs in the Torres Strait and up on the Cape York Peninsula. Dugong harvest in the Torres Strait has been estimated to be at or above 1000 animals per year based on surveys undertaken between 1973 and 2001 (Smyth, 2006),

which according to sustainable harvest estimates by Marsh (2004) must be unsustainable. It is the high levels of hunting in the north that result in indigenous hunting having the "greatest relative effect on the GBRWHA dugong population" (Grech and Marsh, 2008).

Section 2.1.2 - Boats

Although the most publicized affect of boats on dugongs is boat strike, dugongs can also be affected by direct disturbance from boat traffic and noise pollution generated by motor boats (Preen, 2000). According to Preen (2000) vessel traffic has the ability to exclude dugongs from portions of their habitats or limit their access to seagrass beds. In areas where the seagrass is only accessible at high tides, boat traffic in these areas may limit dugongs' access to these nutritionally important food sources. If feeding is limited significantly enough it may lower the dugongs' fecundity further, threatening these already vulnerable mammals (Preen & Marsh 1995).

Dugongs are most at risk from boat strike when feeding in shallow seagrass beds, particularly in areas where fast boats frequent the area (EPA, 2004). These areas are preferred by boaters, particular those in "tinnies", when the water is rough because they tend to be more sheltered and have smaller waves (boater comment). Boat strikes do not always kill the animal on impact but may be fatal eventually because of infection to cuts caused by the propeller or hull of the boat. Studies of Florida manatees killed by boats reveled that 55% were killed by impact, 39% were from propeller cuts, 4% by impact and propeller and 2% by other factors (Wright et al. 1995). Boat strikes are not always reported and injured animals may be more vulnerable to natural predators, while dead dugongs may sink or be carried away with the current, preventing accurate statistics of death caused by boat strikes from existing.

Section 2.1.3- Other Risks

In the Great Barrier Reef World Heritage Area the order risks, in order from greatest to least risk is as follows; indigenous hunting, commercial netting, vessel traffic, terrestrial runoff, and commercial trawling (Grech and Marsh, 2008). Both gill nets designed to catch fish and gill nets used in shark protection programs are dangerous to dugongs. Unlike some species of dolphin dugongs are not deterred by pingers and when a dugong does encounter a mesh net it becomes so entangled that it can't rise to the surface to breathe. For this reason all netting has been banned in Dugong Protection Areas and many shark protection nets in Queensland are being replaced with drumlins to reduce the dugong bycatch (Krogh, 1995). Terrestrial runoff results in destruction of the seagrass habitat (Grech and Marsh, 2008) by limiting sunlight that can reach the grass, and subsequently severely limiting its range. Trawling destroys seagrass beds and is therefore a threat to dugong survival.

Section 2.1.4 –Port Hinchinbrook

In 1977 the waterways around Cardwell were surveyed to find the best site for a new boat ramp and boat harbor because the existing ramp was limited to high tide use only. According to the boat harbor feasibility study conducted by the Queensland Department of Harbors and Marine, there were three locations naturally suited to a boat harbor development. Oyster Point, the location of port Hinchinbrook, was not among the suggested locations, it was only included in the survey because of "representations made by the Cardwell Shire Council in respect of the township of Cardwell" (Queensland Department of Harbors and Marine, 1977). According to the Phoenix newsletter, development at Oyster point began in the 1980s by a company called Tekin Australia but

the original project was never completed. In 1993 Cardwell Properties Pty Ltd bought the property and began development of Port Hinchinbrook. This project was supported by the Cardwell Shire Counsel and according to Margaret Thorsborne about a third of the Cardwell community because of the “benefits of a marina to the tourism potential of Cardwell” (Cassowary Times, 1995) and the potential for new jobs. According to Mrs.Thorsborne this vocal pro Port Hinchinbrook portion of the population made it extremely difficult for the anti-development portion of the population to express their views. It even reached the point that hate notes were sent to citizens from former friends who suggested this particular family “leave town”.

Many of the people who argued against the building of Port Hinchinbrook emphasized the negative affect the development would have on the dugongs living in the Hinchinbrook Channel area. Dr. Tony Preen provided photographic evidence of dugongs feeding at Oyster point on seagrass that would subsequently be dredged upon the creation of a channel to the marina. Meaning the dredging itself would be affecting the dugongs by displacing them to alternative seagrass beds. The affects however were not limited the destruction of a relatively small area of seagrass bed. A 250 berth marina and a two lane boat ramp with parking for up to 100 cars with boat trailers (Williams Corporation, 2001) was predicted to significantly increase boat traffic simply due to increased accessibility to the Hinchinbrook Channel. Preen predicted that dugongs “may eventually be displaced by heavy or persistent boat traffic” (Preen, 2000), traffic which would also limit dugong’s access to particular feeding locations. The facilities finally opened in 1997 and the owner Keith Williams continues to cause controversy with plans of further expansion. The property itself requires constant maintenance such as replacing the sand on the man-made

beaches and dredging the channel leading to the marina and boat ramp, practices which are both expensive for the resort and damaging to the fragile Hinchinbrook ecosystem.

Section 2.2 – Dugong Conservation in the Hinchinbrook Area

Section 2.2.1 Voluntary Speed Guidelines

Voluntary speed guidelines have been established in the Hinchinbrook area in an attempt limit the impact of boats on dugongs. These guidelines ask boaters to go 25 knots within the transit lanes and 10 knots or less over seagrass beds. They are designed to give the dugongs more time to respond to approaching vessels and give the vessel operator more time to spot and react to dugongs in the boat's path. Supporting these guidelines is research by top dugong researchers including Tony Preen. Andersson (1981) found that dugongs respond to vessels moving slowly (5-8 knots) at a distance of 150 meters. Preen (2000) found the response to slow moving vessels varies among dugongs and he discusses the possibility that responses may be related to past experiences. Preen (2000) suggests that the dugongs response to fast boats may be related to water depth. The deep water provides a greater perceived level of safety and dugongs observed in water over 3 meters deep were not dispersed by planning speedboats (Preen, 1992, as quoted in 2000). In water less than 2 meters however dugongs were observed racing for deeper water when a speed boat approached. Unfortunately the dugongs sprint for protective deep water may take them across the path of the boat (Hodgson, 2004), and if the boat is traveling too fast to change course, the dugongs movement could actually increase the risk of boat strike. Due to the fact that most dugong's evasive actions may increase the risk of boat strike it is up to the

captain to take the necessary steps towards preventing boat strike, such as following the speed guidelines and the transit lanes.

Section 2.2.2 Voluntary Transit Lanes

The voluntary vessel transit lanes around Missionary Bay are a continuation of the channel markers and were designed as a way to "concentrate boat traffic and divert it away from seagrass areas" in order to minimize impact on the dugongs (White, 2005). If they are followed they will not only reduce the change of a boat encountering a dugong in shallow water but it will keep boats from reducing dugong access to their preferred feeding grounds. Russell Butler also expressed the hope that dugongs will learn where the transit lanes are located and associate them with vessel traffic thereby resulting in avoidance of those high traffic areas. According to Leon Jackson of GBRMPA both the speed guidelines and transit lanes are voluntary because making these into laws requires an infrastructure to support them. Keeping them simply a suggestion for boaters is a much cheaper alternative but still allows there to be an initiative in place attempting to reduce vessel strike.

Section 2.2.3- Native Title and TUMRA

The Native Title Act (1993) preserves Indigenous peoples rights to hunt, fish, gather or undertake other cultural or spiritual activities where these activities would normally be restricted by commonwealth, state or territory legislation. These hunting rights include the right to hunt species such as the dugong which is globally threatened. Many Aboriginal communities have gotten involved in the conservation of dugongs and have put restrictions on hunting them to allow for the species to recover. A number of different agreements have been reached in different communities along the coast of Australia; in the

Hinchinbrook area specifically the Girringun Aboriginal Corporation is responsible for the establishment of a Tradition Use of Marine Resource Agreement (TUMRA). This agreement is between the saltwater traditional owners, the Great Barrier Reef Marine Park Authority (GBRMPA) and the Queensland Parks and Wildlife Service (QPWS) (Girringun, 2008). This formal agreement puts a complete ban on dugong hunting in the Girringun region which extends from Maria creek on the north point, down to Rollingstone Creek in the south. It follows the coast on the west side and on the east side zig zags from reef to reef, (Figure 3). Once the TUMRA has been accredited its conditions can be enforced, however the TUMRA itself "will not affect a Traditional Owner's native title right to hunt under s.211 of the *Native Title Act 1993"* (Dugong and Marine Turtle Knowledge Handbook). According to Philip Rist of Girringun there have been no reports of dugong hunting. As it is set up now the TUMRA is more a way to get traditional owners involved in joint management of their traditional land and the traditional take of turtles and dugong than to provide complete protection to a species. The advantage of a TUMRA is that it can change every couple of years depending on dugong and turtle populations while laws are much harder to change. In the future Mr. Rist hopes that Girringun can maintain a TUMRA, but wants to have the Nature Conservation Act refer to the TUMRA so that the agreement can be enforced and not simply voluntary.

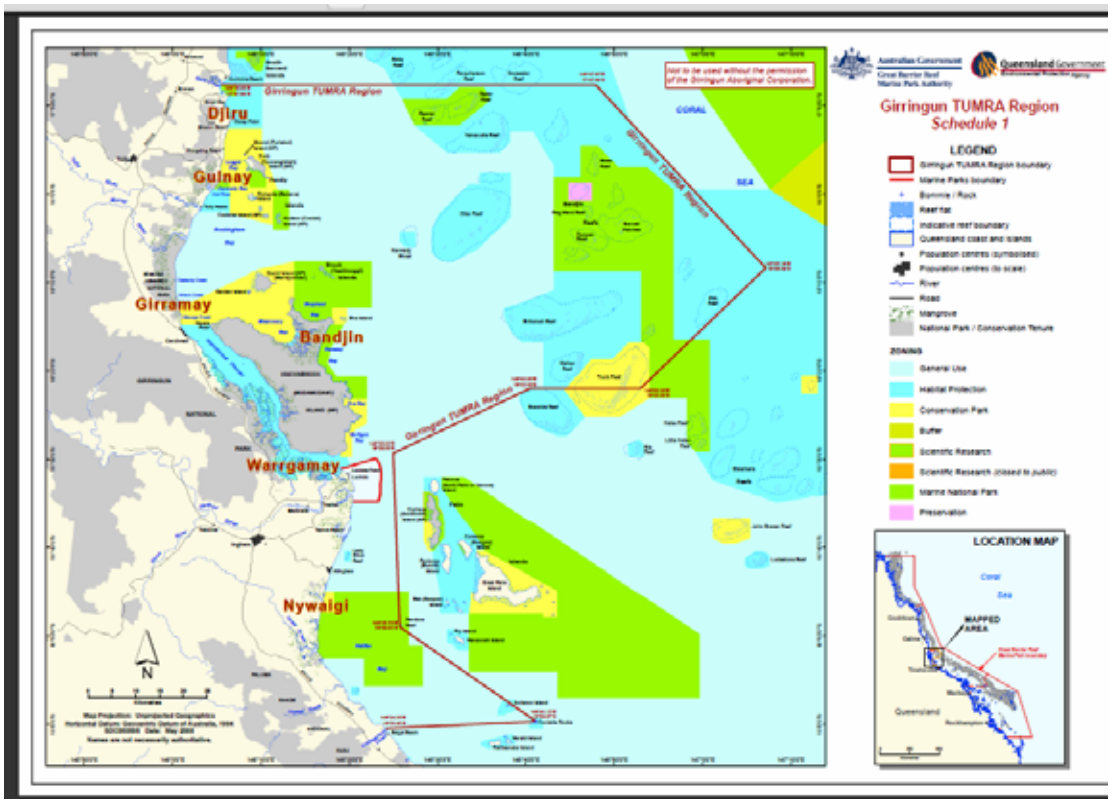

Figure 3. Girringun TUMRA region.

Section 2.2.4 – Publicity for Dugong Conservation Incentives

The following signs mention either the presence of the TUMRA in the Hinchinbrook area or discuss the presence of a Dugong Protection area.

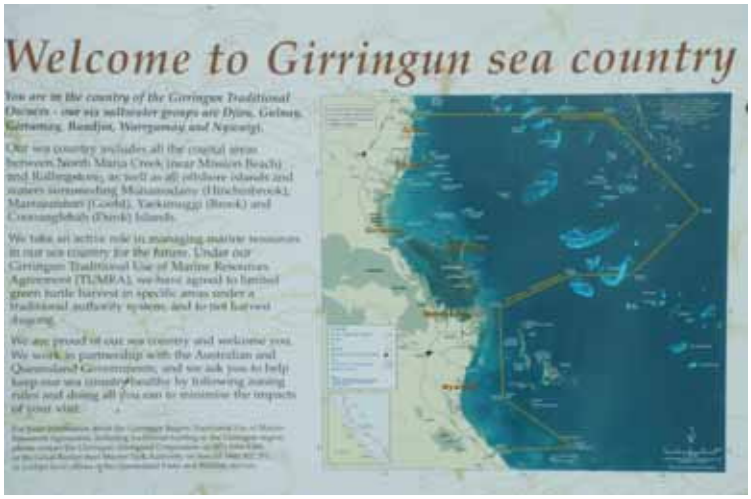

Figure 4. Welcome to Girringun sea country. This sign explicitly mentions the presence of the TUMRA and explains the voluntary ban on dugong hunting.

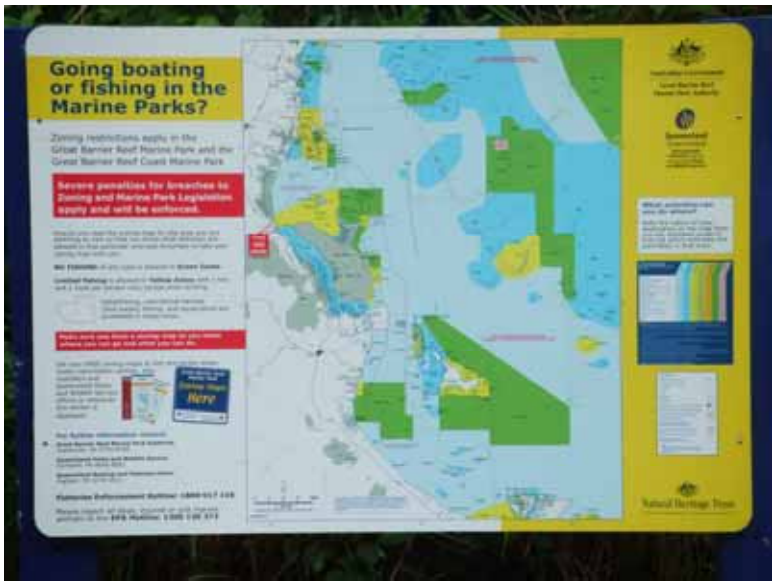

Figure 5. Marine Parks Zoning Map, explains what activities are permitted in which areas and mentions the need for a TUMRA permit for any hunting not covered in s.211 of the Native Title Act 1993.

Figure 6. Dugong Protection Area, explains why they are protected and shows where the transit lanes are located and the voluntary go-slow areas.

In addition to these signs, maps given out to boaters by the Reef and Rainforest Information Center feature the GBRMPA zoning and a brochure called “Marine Wonders of Hinchinbrook” features a section that explains how to use the Hinchinbrook Transit lanes and tells readers about the speed recommendations. Dugong Protection Area (DPA) brochures can be found at GBRMPA headquarters in Townsville. Additionally the Queensland Parks and Wildlife Service stop to talk to boaters while they are patrolling and hand out zoning maps.

Section 2.2.5 – Understanding Boaters’ Non-Compliance with Speed Guidelines Introduced for Dugong Conservation

A study conducted by Alana White in 2005 reveled overall positive attitudes towards voluntary speed guidelines and dugong conservation as well as a high level of general knowledge of dugongs and their conservation. However Groom and Lawler (2003) have shown that there is a low level of compliance with both the transit lanes and the speed guidelines among recreational boaters, which is contradictory to the high levels of knowledge and positive attitudes. There was a lack of knowledge associated with the speed guidelines that could account for up 44 percent of non-compliance with the guidelines however, Groom (2003) found compliance to be only 20 percent of boaters. In White’s survey of Hinchinbrook area boaters many respondents commented on the traditional hunting of dugongs by indigenous Australians. Many comments related to the fact that purposeful killing of dugongs was allowed to continue yet they as individuals were expected to alter their actions to decrease boat strike, which was felt to be less threatening to dugong populations. This feeling of inequality could be contributing to the low level of

compliance with speed guidelines and transit lanes (White, 2003) and was a suggested area of further study by White.

Section 2.2.6 – Reef Guardian

The reef guardian program is currently being implemented by 188 schools (reefED, 2008) in Queensland. The focuses of the program are curriculum offerings, management of resources, on-the-ground projects in the school and community and lastly the education of the community. The schools that participate in the Reef Guardian program range from primary schools, such as the local Cardwell State School, to local colleges. Debbie Archibald the principal of Cardwell State School informed me that they do have a local focus in their program and talk about how the mangroves play into the system, and what has affects on the Hinchinbrook waterways.

Section 2.2.7 – The Tree Kangaroo and Mammal Group

The Tree-Kangaroo and Mammal Group (TKMG) is a community based group that is mostly made up of local residents with diverse backgrounds including ecologists, farmers, artists, eco-tourism operators and teachers. This group is based in north Queensland on the Atherton Tablelands and was founded by local residents in 1997. The main focus of the group was originally conservation of Lumholtz's Tree-kangaroo, but it has diversified to include other threatened north Queensland mammals. The groups goals are "to conserve tree-kangaroos and other far north Queensland mammals by promoting the public awareness and knowledge of these animals, to undertake and assist with studies into their habitats, and to liaise with groups and organizations with similar objectives" (Schmidt et al. 2000). They sponsor projects such as the community survey of Lumholtz's Tree-

kangaroo. This survey was conducted in 1998-1999 and not only helped to collect data on this important animal but also helped to raise awareness for their conservation. The survey asked residents to report tree-kangaroo sightings and other relevant information that evaluated local knowledge of the animal as well as historical and current distribution. Eight hundred surveys were returned with information on 2000 sightings, which helped to define a distribution and approximate density of these threatened animals. (Schmidt et al. 2000)

Chapter 3. Methodology

Section 3.1 Introduction

This research attempts to further examine some of the questions addressed in Alana White's study of boaters in the Cardwell area particularly the attitudes regarding aboriginal hunting. Additionally it further examines the level of self reported compliance to speed guidelines and transit lanes.

This study also examines the feasibility and usefulness of conducting a full community survey. While additionally exploring the possibility of setting up a conservation focused group, similar to the Tree Kangaroo and Mammal Group.

Lastly I examined general knowledge of the dugong, perceived increase or decrease and opinions regarding its conservation.

Section 3.2 Research Location

Russell Butler predetermined the location of this study due to his interest in the views of Cardwell citizens after the creation of the TUMRA.

Cardwell, 18°15'56.35"S 146°01'40.54"E, (GoogleEarth) is approximately a two hour drive south of Cairns and a two hours drive north of Townsville. The population according to the 2006 census (Australian Bureau of Statistics, 2007) was 1,250. It is the location of the Girringun Aboriginal Corporation headquarters, a group who acts as the organizational power for the Aboriginal community and helped to develop the local TUMRA.

The town is located on the Hinchinbrook waterway which is home to a number of islands including Goold, Brooks, and most famously Hinchinbrook. The waterway has numerous seagrass beds; the largest and most well known is located in Missionary Bay on the northern end of Hinchinbrook Island. Other seagrass beds are located the length of the Cardwell foreshore, along the western border of Hinchinbrook Island, and to the west of Goold Island. All seagrass beds are known to support dugongs according to aerial surveys and satellite tracking conducted by Tony Preen (2000) and Helene Marsh (2002).

Figure 7. Cardwell and Port Hinchinbrook.

There is water access for boaters at Meunga Creek boat ramp, Marine Parade boat ramp, Port Hinchinbrook boat ramp and Port Hinchinbrook Marina. Fishermen can access the water along the entire stretch of beach, as well as from the jetty and marine parade boat ramp. The majority of surveying was conducted at the Port Hinchinbrook Marina and boat ramp because they support the highest density of boaters.

Section 3.3 Development of Questionnaire

The questionnaire (Appendix A) was based on the questionnaire used by Alana White during her survey of the Cardwell area and aspects of the community interviews in the Gulf of Mannar (Ilangakoon, 2008). The questionnaire was kept under 10 minutes based on White's (2005) observation that this was the longest time a boater could be questioned without irritation. Five and three point Likert scales (White, 2005) were used in the questionnaire to determine attitudes and level of knowledge. These scales were based on scales used by White (2005) in her questionnaire.

The overall structure of the questionnaire was:

1. Demographics and general information (Q1-6)
2. Dugong sightings and general knowledge (Q7-11)
3. Familiarity with conservation initiatives, legislation, and native title and source of knowledge (Q12-15)
4. Personal Opinions
5. Perceived Impact of Human activities
6. Reports of Illegal activities and dugong strikes
7. Compliance with conservation guidelines, and the impact of indigenous hunting on that coherence.

Section 3.3.1 – Testing the Questionnaire

The questionnaire (Appendix A) was tested on four friends who checked for readability and clarity. The first half day of surveying was used as a trial run with four surveys conducted and questions and order of questions subsequently changed.

Section 3.4 Data Collection

Data was collected over a period of two weeks beginning on Saturday, November 15th 2008. Boaters and fishermen were surveyed along the Cardwell foreshore, on the Jetty, at the Marine Parade boat ramp, at the Port Hinchinbrook Marina and boat ramp, as well as a couple surveys done by phone with local fishing guides.

The majority of surveys were conducted at Port Hinchinbrook. Although weekends proved to be the best time for surveying, due to a greater abundance of subjects, weekdays proved to be helpful, as professional fishermen were present. Most surveys were conducted before lunch because boaters and fishermen tend to be most active early in the morning, however some were conducted in the evening as well.

There was an equal response rate among boaters before they set off and after they returned. The survey was filled out by the surveyor allowing for the subject to continue with their activity and to allow for unsolicited comments to be recorded. This also prevented confusion with the questions because they could be explained if needed

Section 3.5 Data Analysis

Excel was used for all data input and analysis. Data on all questions from the questionnaire is included with the more important data present in graphs and tables. Any comparisons were done using pair-wise cross-tabulations in excel.

Statistical significance was not determined for any of the relationships because the small sample size (38 respondents) limits significance and instead the graphs show general trends and relationships that could be investigated in greater detail in the future.

During data analysis the 5 point scale used in question 17 (Appendix A) was collapsed into negative, positive and unsure from -2,-1,0,1,2, which shows more general trends, without losing data.

With a total of 41 questions or sub-questions an excessive number of cross-tabulations (>1500) could be made, so only those that further expand the current state of knowledge were included.

Chapter 4. Results

Section 4.1 General Information and Demographics

Most (75%) of the surveyed boaters and fishermen using the Hinchinbrook area were male and 50% were between the ages of 50 and 69. On the day of the survey 55% of all respondents had been fishing or boating while the other 45% were involved in another activity such as cleaning their boat. The majority (53%) of respondents use the Hinchinbrook waterways on a weekly or fortnightly basis, with many of the weekly users boating or fishing multiple times in one week.

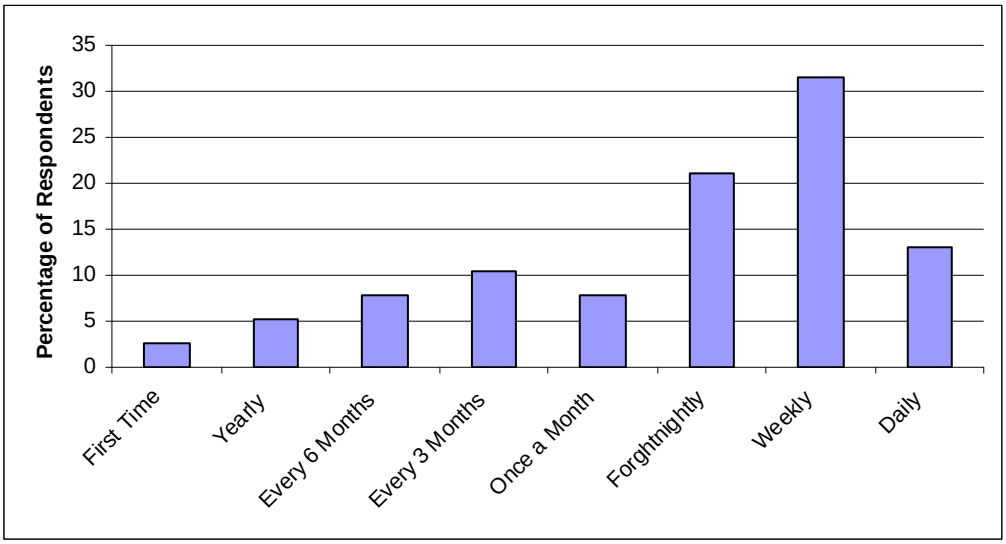

Figure 8. Frequency with which respondents boat or fish in the Hinchinbrook Channel.

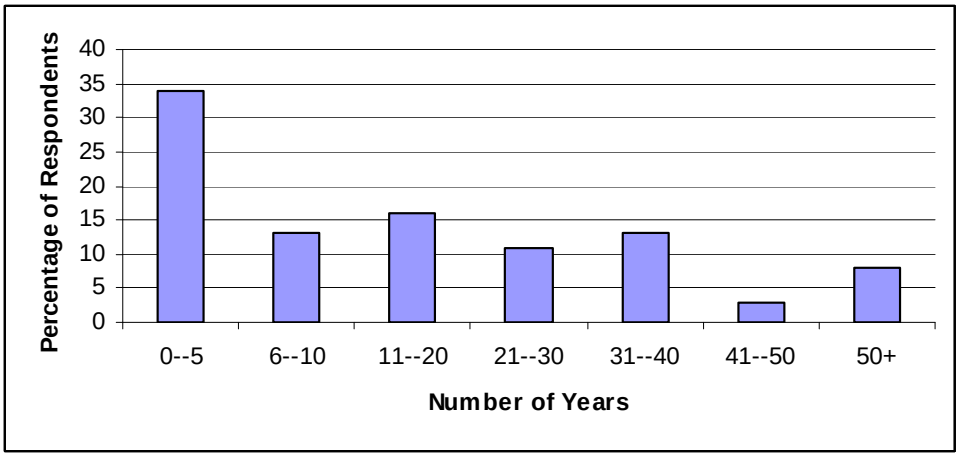

Figure 9. The number of years respondents have been coming to the Hinchinbrook area.

The boat ramp at Port Hinchinbrook opened in 1997 and 47% of respondents have only been coming to the area since the opening. The largest age group of respondents (34%) has only been coming to the area for less than 5 years (Figure 8).

The majority of people surveyed (87%) had seen a dugong in the Hinchinbrook area before and many had seen them on multiple occasions. Most reported in which location they most often saw dugongs, though some participants could not remember where they had seen the dugongs and others were not willing to reveal sighting location

The Cardwell beach and Jetty had the highest percentage of reported sightings with 31%, while Missionary Bay had 29% of all sightings. The “other” category includes sightings as far down the channel as Lucinda and includes sightings in small creeks and Hinchinbrook channel itself.

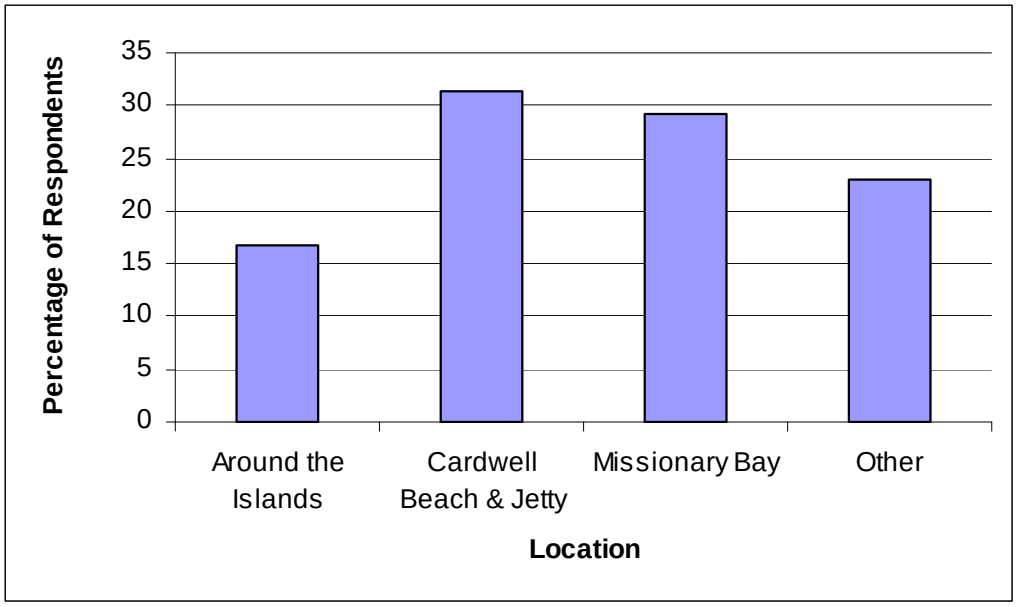

Figure 10. Location of Dugong sighting. All the small islands were grouped together as well as the Cardwell Beach and Jetty because of their overlapping boundaries.

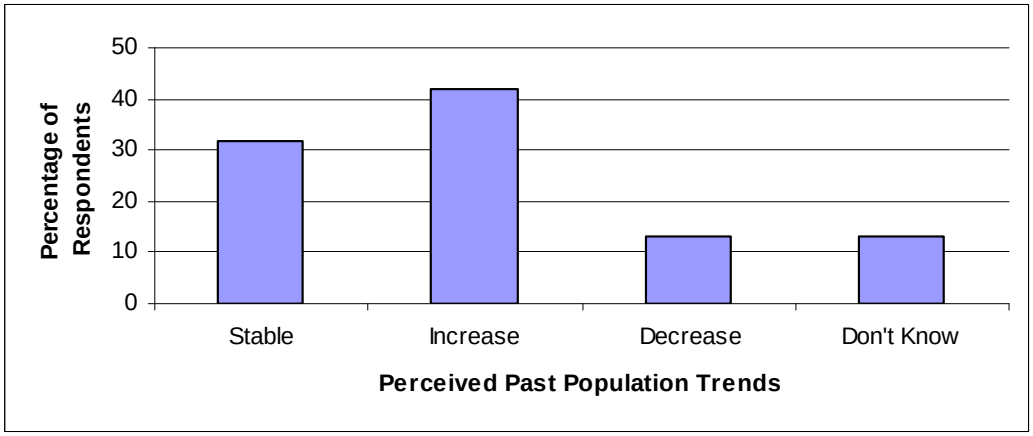

Figure 11. Respondents Perception of Populations Trends in the Past 5 years

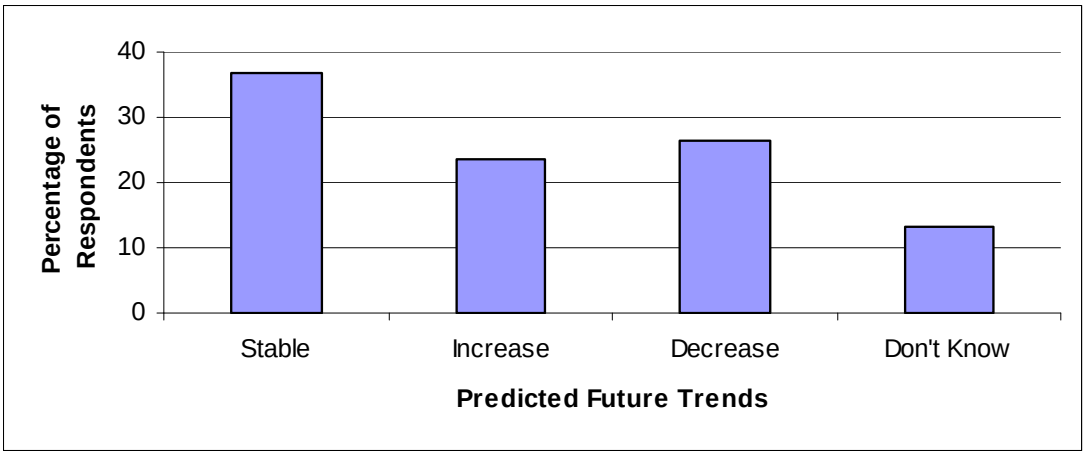

Figure 12. Respondents Predictions for Dugong Population Trends in the next 25 years.

Section 4.2 – General Dugong and dugong conservation incentive knowledge

The majority of people (52%) felt that they were moderately knowledgeable regarding dugongs, most of this knowledge pertaining to their habitat and habits, not their biology.

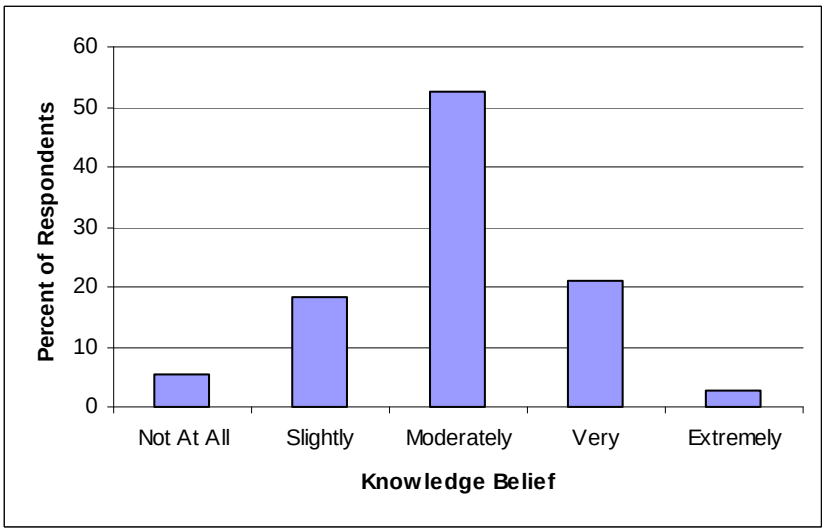

Figure 13. Self assignment of knowledge level regarding dugongs

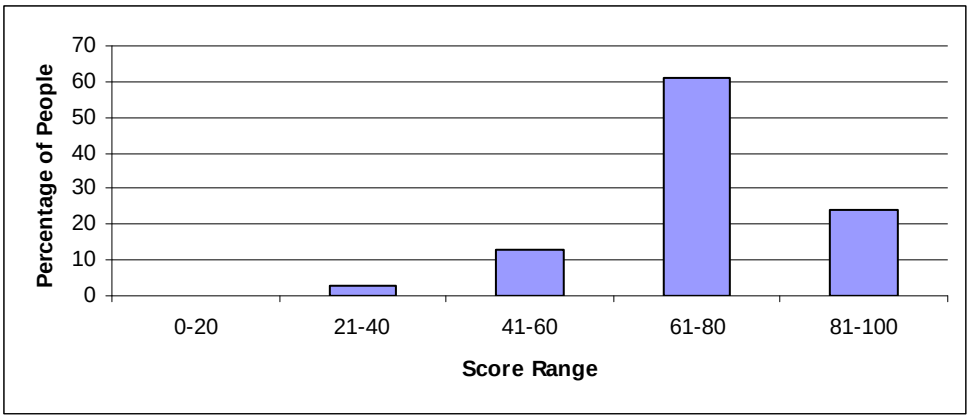

Figure 14. The range of scores from the true or false questions portion of the survey

The highest percentage of people (61%) scored between 61 and 80 percent on the true or false section of the survey. The only question that the majority (71%) of respondents answered incorrectly was whether dugongs are classified as endangered or not. The question of whether dugongs are at 3% of their original population in the Hinchinbrook area was split (37-29-34) between correct, incorrect, and unsure. Aside from those two questions the majority of people answered the majority of questions correctly.

Table 1. True or False Questions and Percentage Answered Correctly

	Correct	Incorrect	Unsure
Dugongs are classified as endangered.	18%	71%	11%
The waterways around Hinchinbrook Island are Part of a Dugong Protected Area	87%	8%	5%
Dugongs do not migrate from one seagrass bed to another	71%	11%	18%
Dugongs eat fish	84%	8%	8%
Dugongs are still hunted in parts of Australia	84%	8%	8%
Recorded Boat Strikes are uncommon in Australia	63%	32%	5%
Dugongs are currently at 3% of their original population in the Hinchinbrook area	37%	29%	34%
Dugongs reproduce quickly ($\geq$ 1 calf each year)	66%	5%	29%

In the past 5 years the highest percentage of respondents (42%) believe that dugong populations have increased, while 32% believe the populations have remained stable and 13% believe they have decreased. 37% of respondents believe that in the next 25 years dugong populations are most likely to remain stable. However 26% believe the populations

are bound to decrease, and 24% are optimistic believing they will increase. They remainder of respondent felt they were not informed enough to predict population trends or reflect on past trends.

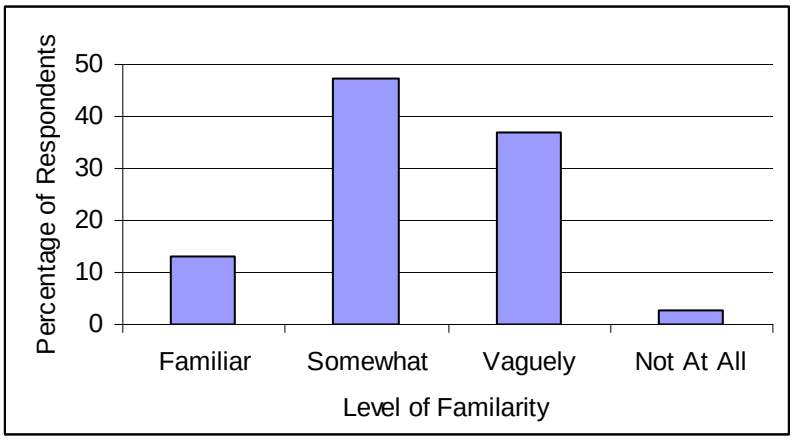

Figure 15. Respondents' level of familiarity with Native Title hunting legislation

The majority of respondents felt that they were either somewhat familiar (47%) or vaguely familiar (37%) with Native Title hunting laws. 36% of all respondents heard about Native Title though word of mouth. This was also the question that elicited the most unsolicited comments regarding Aboriginal Australians.

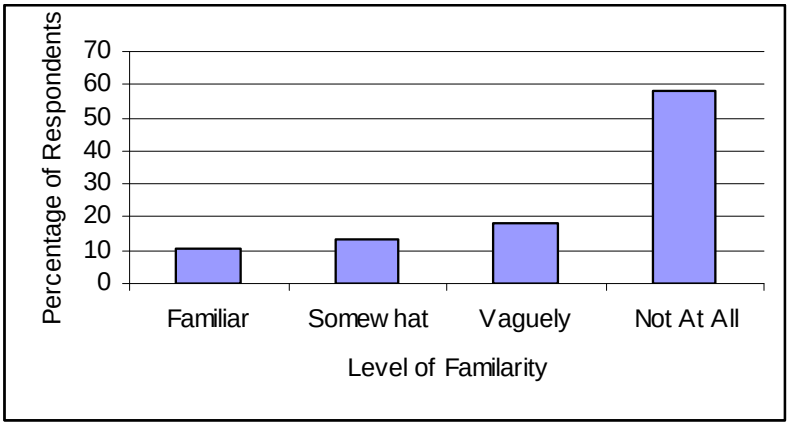

Figure 16. Respondents' level of familiarity with the Hinchinbrook area TUMRA

The majority of respondents (58%) were not at all familiar with the TUMRA between the Girringun traditional owners and GBRMPA. The majority of those who had

heard about it were split in sources of information between media, word of mouth and Girringun.

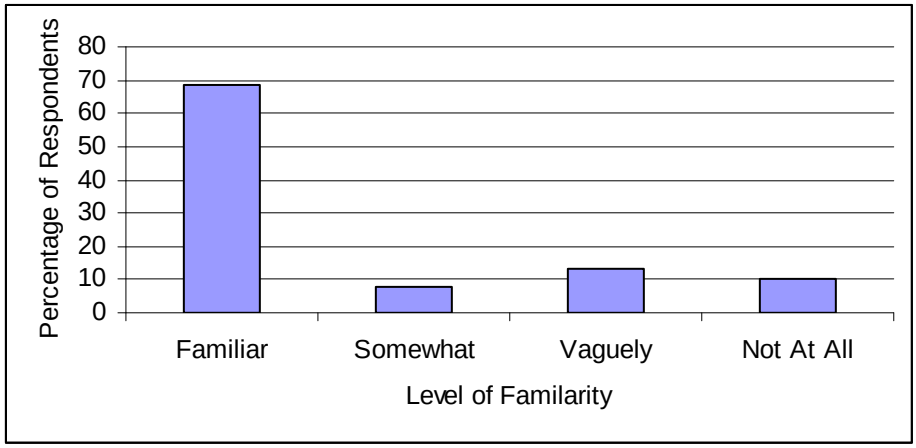

Figure 17. Respondents level of familiarity with the transit lanes.

The majority (68%) of respondents felt that they were familiar with the transit lanes in Hinchinbrook Channel and Missionary bay. The three highest reported sources of this information were signs/brochures (18%), maps/charts (23%), and simply seeing the markers in the channel (23%).

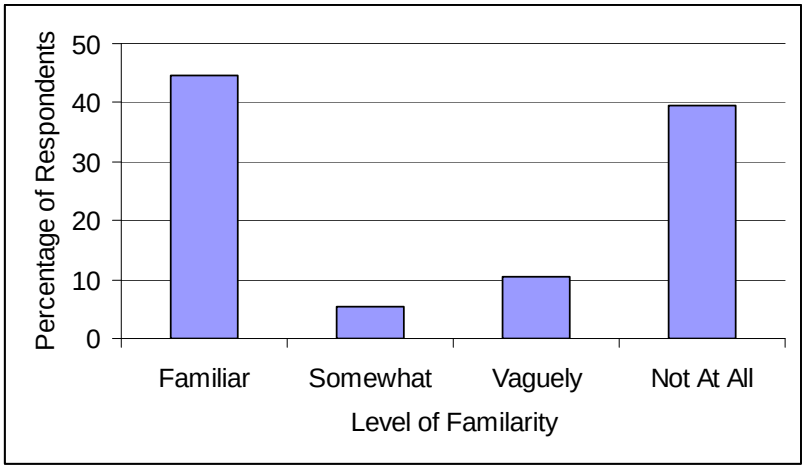

Figure 18. Respondents level of familiarity with the voluntary speed guidelines

This trend shows that most people are either familiar (45%) with the speed guidelines or have never heard of them (39%). Of the people who had heard of the speed guidelines 45% of them heard about the guidelines from signs or brochures. .

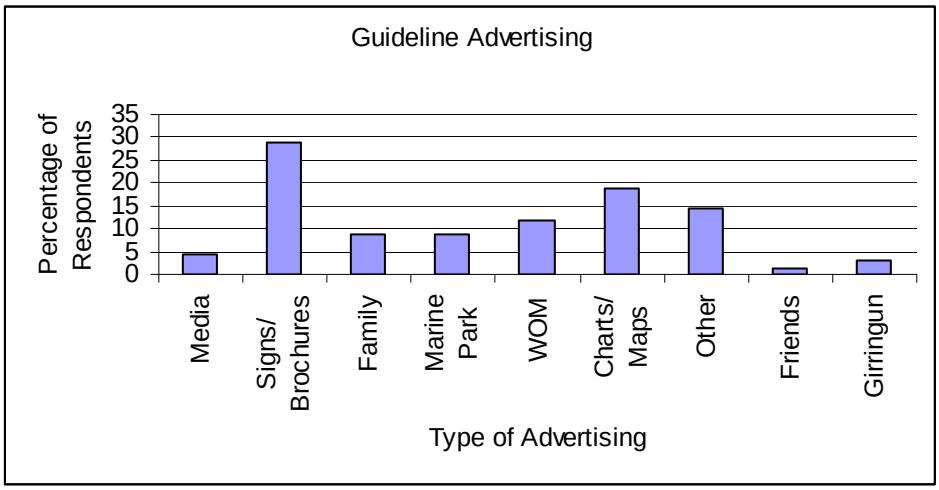

Figure 19. The most efficient type of advertising for conservation initiatives

The greatest percentage (29%) of respondents was informed of the conservation initiatives by signs or brochures such as those given out in the rainforest and reef information center. Charts and maps are also found to be a good source of information, enlightening 19% of respondents about the speed guidelines and transit lanes.

Section 4.3 - Personal Opinion

Section 4.3.1 – Responses to Survey Questions

The majority of respondents (61%) felt negatively about native title. The majority of respondents felt positively about TUMRA, Speed Guidelines and Transit Lanes.

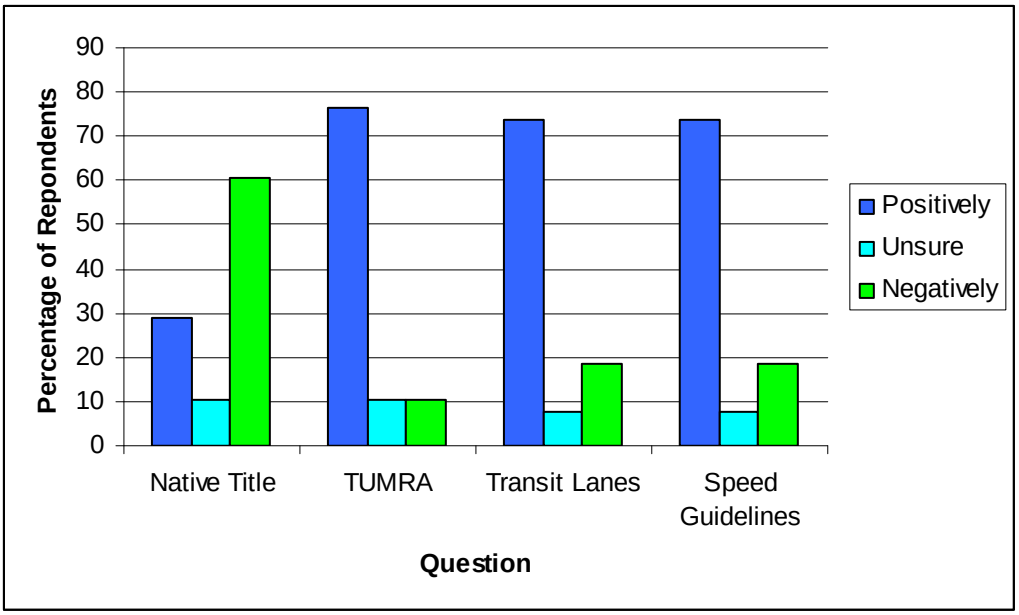

Figure 20. Respondents' opinion of native title and local conservation initiatives

The overwhelming majority (92%) of respondents believe that dugongs are an important part of the ecosystem and 82% believe they are important in bring tourists to the area. A small percentage of people believe that conservation is over publicized by the "greenies" but the majority (76%) believe there is either adequate or not enough publicity for their conservation. 95% of people believe it is everyone's shared responsibility to protect the dugong while only 84% included themselves in the category of everyone and were personally willing to change their actions to help with conservation.

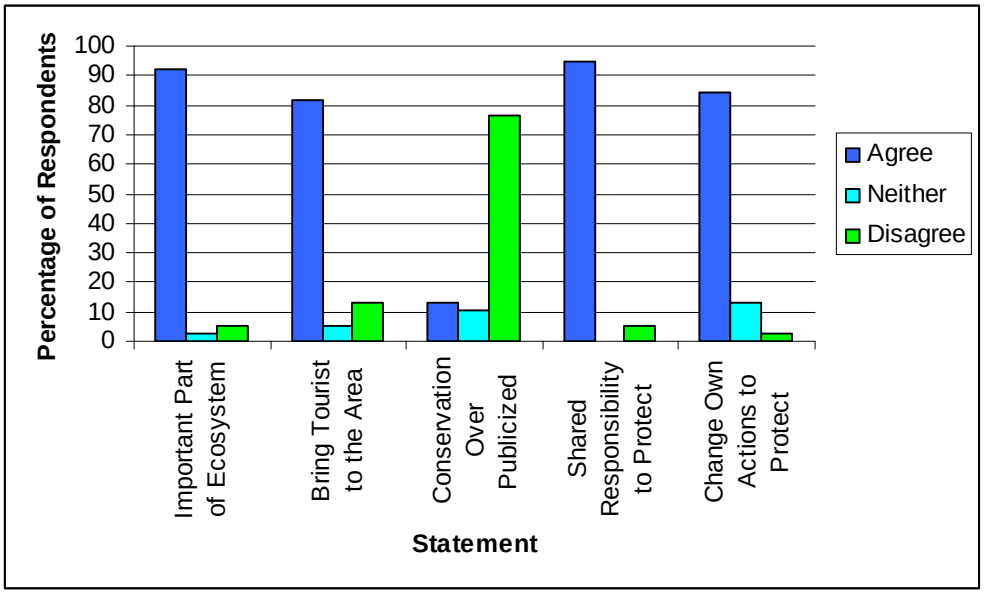

Figure 21. Respondents' opinion on dugong importance and conservation

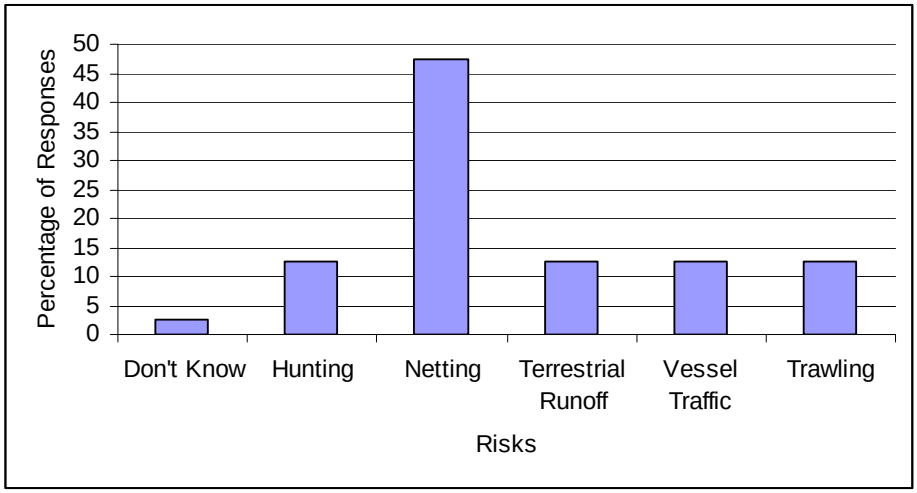

Figure 22. The greatest perceived human contribution to dugong decline in Australia

48% of all respondents believe that gill or mesh netting poses the greatest risk to Australian-wide dugong populations. Trawling, vessel traffic, terrestrial runoff, and hunting all come in second with 13% each.

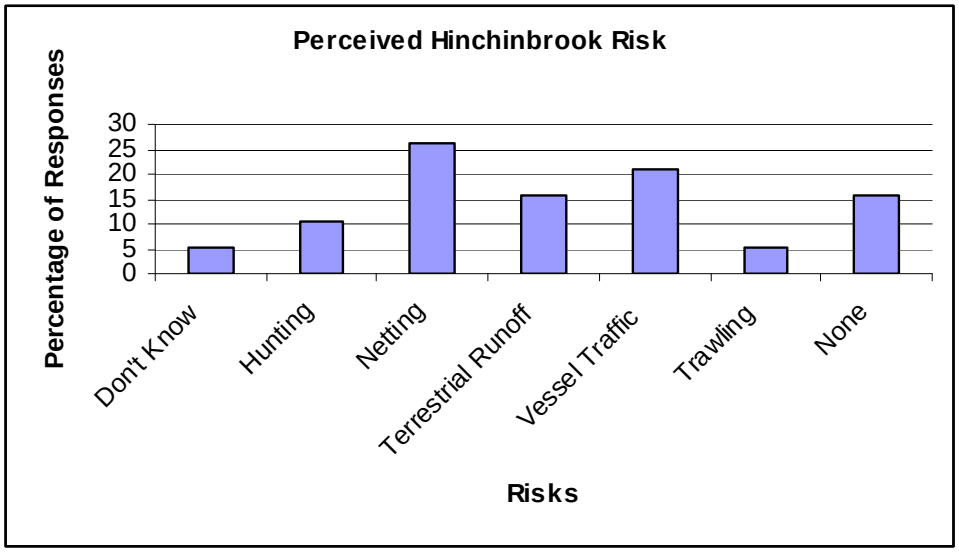

Figure 23. The greatest human impact on dugong populations in the Hinchinbrook area.

While 47% of respondents believed that either netting or vessel traffic was causing the most harm to Hinchinbrook dugongs, 16% believed that people had no affect whatsoever on the dugong populations. Seeing illegal gill nets in use is common - 37% of respondents reported having seen an illegal net being used before. However, no illegal hunting of dugongs was reported. 21% of respondents report either having hit a dugong or hearing about someone that has, although people either do not know the location of the vessel strike or are not willing to share the information.

Section 4.3.2 – Unsolicited Comments

Comment/ Theme
Dugongs shouldn't be hunted.
It's not as if the Aboriginals need food, they can go to the store like everyone else.
There are too many restrictions in place protecting the dugongs.
Greenie Related Comments.
Aboriginals are too drunk or lazy to hunt dugongs anymore.
Dugongs can't tell where you're coming from so it's important to look out for them.
If Aboriginals are going to hunt traditional foods they should use traditional methods such as canoes and spears.
Transit Lanes would be good, but there are dugongs in them.
Few boats follow the Vessel Transit Lanes.
If a species is endangered nobody should be able to hunt it.
People should be made aware of the speed guidelines and transit lanes.
The people you call to report illegal activities don't respond quickly enough or at all.
Speed Guidelines and Transit Lanes should be laws so they can be enforced.
Dugong populations will decrease if netting is reintroduced into the Hinchinbrook area.
The dugongs are much less shy now than they were in the past.
Native title should only apply to aboriginals who are "full blood".
Humans in general are the cause for the decline of the dugong population.
Not willing to report illegal activities to the authorities because it gets you in trouble in the end.
Dugongs are considered endangered, but I don't agree with that classification.
Nobody follows the speed guidelines.
Many dugong strikes go unrecorded/ unreported.
Tourists don't know about the speed guidelines and transit lanes.
The TUMRA is good as long as it is followed.
Would only be willing to call the authorities if positive that the activity was illegal (such as netting).
Transit Lanes and speed guidelines are disruptive and increase travel time.

Section 4.4 – Pair-wise cross tabulations

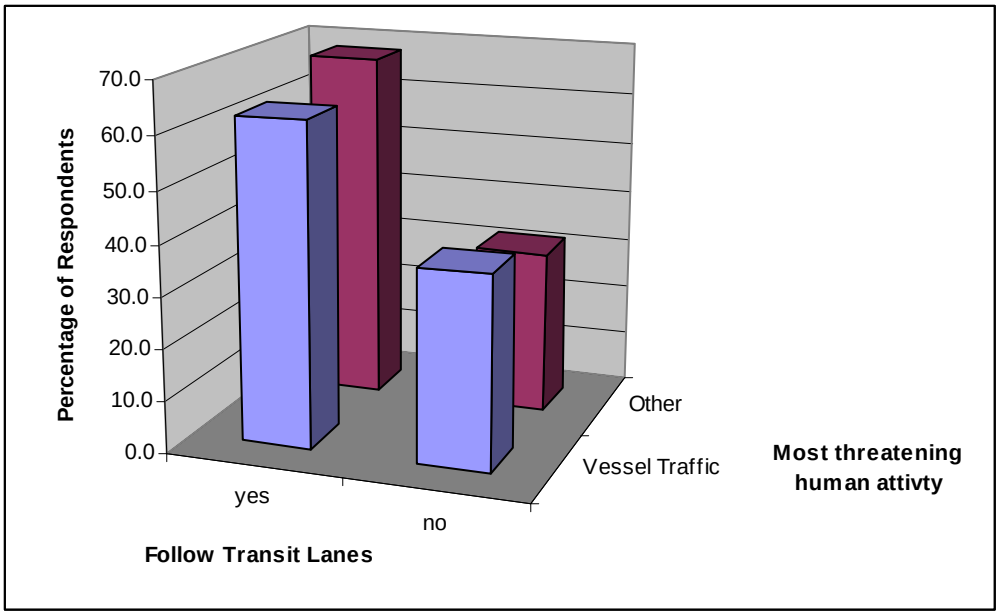

Figure 24. Most threatening human activity to dugongs in Hinchinbrook waterways compared to whether respondents follow the transit lanes

Of the people who consider vessel traffic to be the most threatening human activity to dugongs in the Hinchinbrook waterways only 62.5% actually follow the transit lanes put in place to reduce the impact from boats. However 68% of people who believe that the greatest impact on the dugongs is a human activity other than vessel traffic, do follow the transit lanes. The group of respondents most likely to follow the transit lanes is those who believe that netting is most threatening human activity to dugongs in the Hinchinbrook waterways.

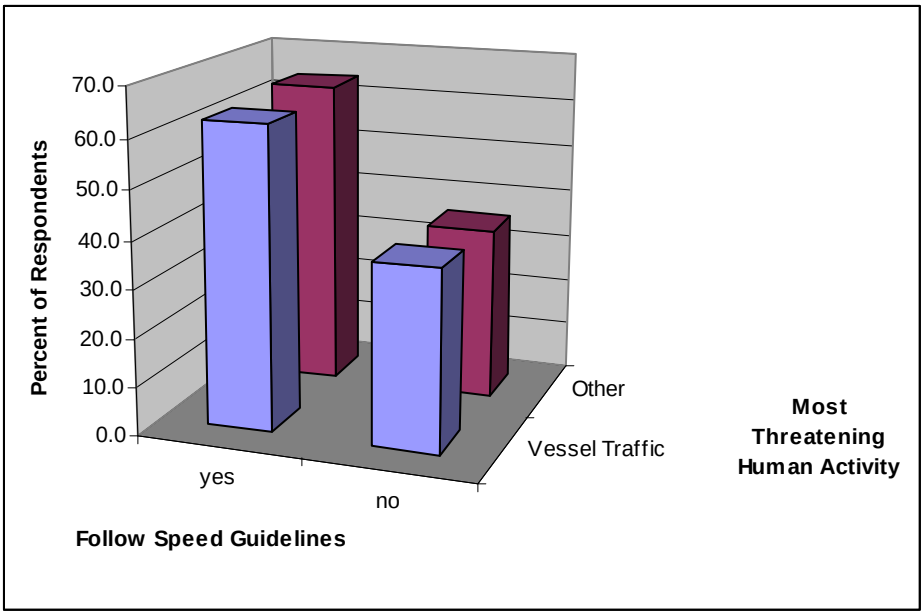

Figure 25. Most threatening human activity to dugongs in Hinchinbrook waterways compared to whether respondents follow the speed guidelines

Of the respondents who believe vessel traffic is the most damaging human process to dugong populations in the Hinchinbrook area 37.5% do not follow the speed guidelines. Of the respondents who consider something other than vessel traffic to be the most threatening process 36% do not follow the speed guidelines.

Figure 19 shows that the majority of respondents from all areas feel positively about the speed guidelines. Of the locals 70% feel positively about the transit lanes, while 86% of non-locals feel positively about the transit lanes, and 75% of people living on their boats feel that transit lanes are a good thing. The largest percent of people who dislike transit lanes are locals (26%), while no non-locals and boat dwellers approve.

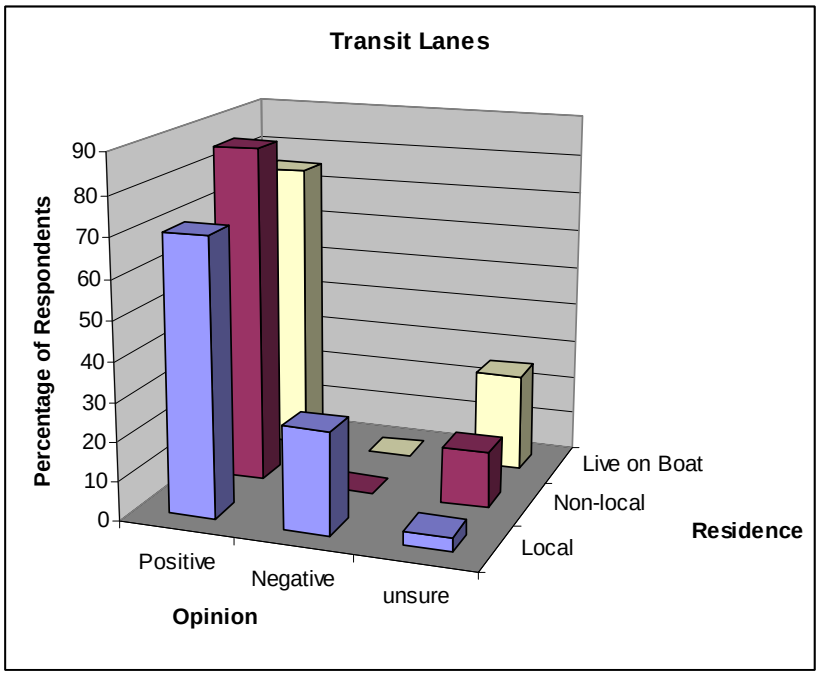

Figure 26. Opinion on the transit lanes compared to respondents residence

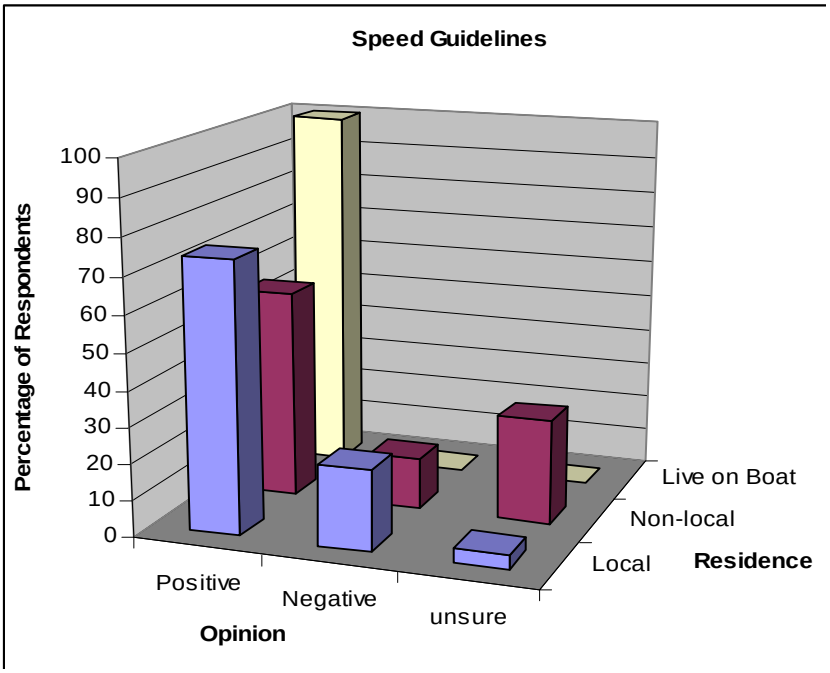

Figure 27. Opinion of the Speed guidelines compared to respondents residence

Of the local respondents 74% felt positively about the voluntary speed guidelines. In contrast 100% of people living on their boats feel positively about the speed guidelines. Of the people who believed the speed guidelines were a negative thing 86% were local.

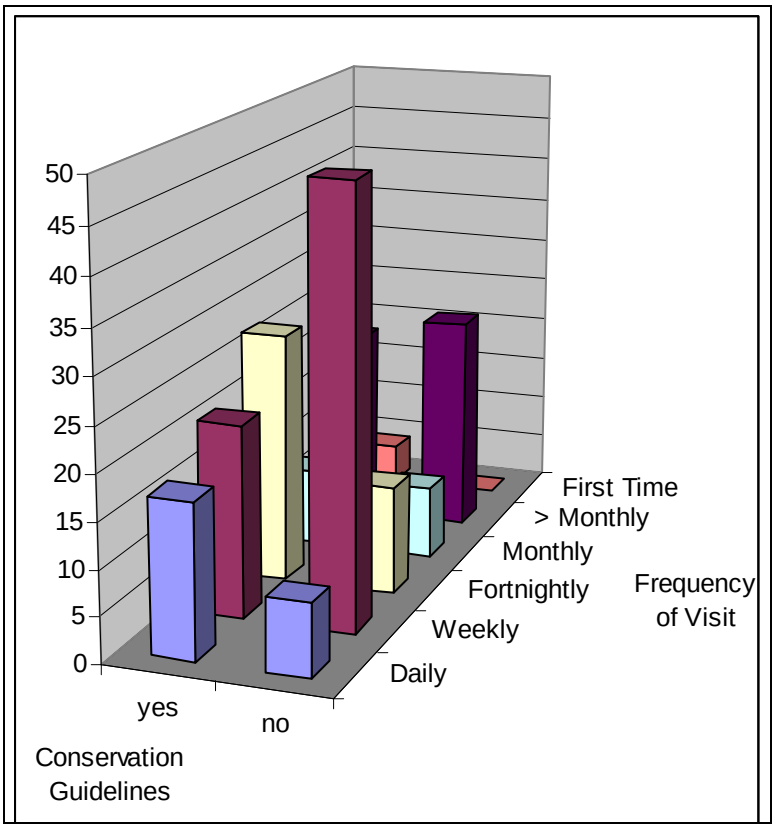

Figure 28. Of the respondents that follow the conservation guidelines (speed guidelines and transit lanes) what percent use the Hinchinbrook area with each frequency?

Of the respondents that don't follow the speed guidelines and transit lanes the greatest percentage (48%) are weekly users of the Hinchinbrook channel. The greatest number of respondents that do follow the conservation initiatives are fortnightly users of the area (28%) followed by the monthly and greater than monthly users at 21%.

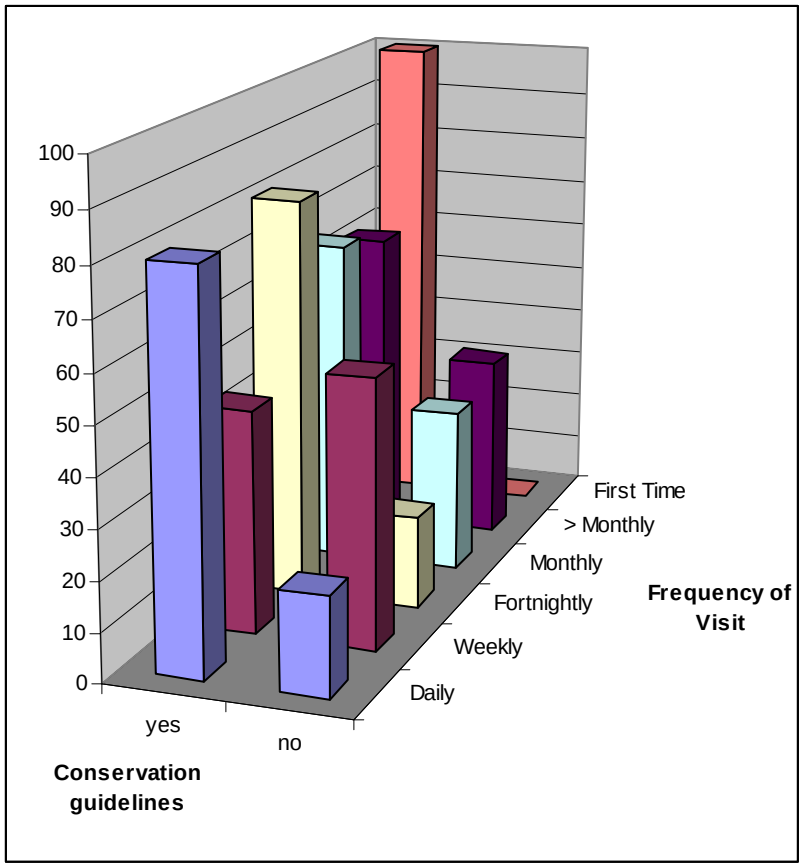

Figure 29. Of the people that visit the Hinchinbrook area with each frequency what percent follow the conservation guidelines (speed guidelines and transit lanes)?

The group of respondents with the highest level of compliance to the conservation initiatives is the group of first time users of the Hinchinbrook waterways (100%). The daily and fortnightly users have high levels of compliance with 80% and 81% respectively. The weekly users had the highest rate of non-compliance with 55% of users not following conservation guidelines.

Chapter 5. Discussion and Conclusions

The lack of compliance with speed guidelines and transit lanes among frequent users of the Hinchinbrook area is a concern because of the dugongs' vulnerable status and high susceptibility to anthropologic activities.

The lack of knowledge regarding the speed guidelines may be contributing to the low levels of compliance. Suggestions regarding future management and awareness programs are included.

Based on discussions with Mrs. Thorsborne and Mr. Winter a community conservation group could not be established in the area and a full community survey may not be effective.

Section 5.1 - Knowledge of Dugongs and Dugong Conservation Guidelines

When asked how knowledgeable they felt they were regarding dugongs 52% of respondents felt that they were moderately knowledgeable, while only 21% felt that they were very knowledgeable. According to the true or false assessment of knowledge the highest percentage of people (61%) scored in the very knowledgeable range and only 13% scored in the moderately knowledgeable range. While the majority of people answered question 17a (appendix a) incorrectly, had the wording been changed to "according to the ICUN dugongs are threatened" instead of "endangered" I believe most respondents would have answered correctly. It may not be common knowledge that there are multiple classifications within the threatened category, not simply endangered or not endangered. Since it is generally believed that there is a link between knowledge and behavior these

high levels of knowledge should hypothetically result in high levels of compliance with conservation guidelines (White 2005).

Dugong conservation guidelines include voluntary speed guidelines and vessel transit lanes. Only 11% of respondents were not at all familiar with the vessel transit lanes indicating an extremely high level of knowledge regarding the presence of vessel transit lanes. There were however some respondents who had seen and used them, but did not know they were in place for dugong conservation, they though they were simply in place to help large boats avoid shallow waters. The split in knowledge regarding speed guidelines show that most people either know a lot about the guidelines (45%) or nothing at all about them (39%).

Section 5.2 - Knowledge and Opinions of the TUMRA and Native Title Legislation

Only 3% of respondents were not at all familiar with the Native Title hunting legislation but most (84%) were either somewhat or vaguely familiar with 36% having heard about native title though word of mouth. These numbers begin to explain why so many people commented that native title should no longer exist or why they believe that if aboriginals are going to hunt their traditional food they should have to use “traditional methods”. The vague familiarity may be based on misinformation coming from a unreliable source.

Sixty one percent of respondents felt negatively about Native Title hunting legislation. Many of these respondents commented that these laws should not exist anymore and that if Aboriginals are going to hunt their traditional foods they should have to use traditional methods, such as a canoe and spear, to do the hunting. Despite this high

level of negative feelings towards hunting protected by Native Title, only 12.5 percent of respondents believed that it was the most threatening human process to the Australian dugong population. According to Gretch and Marsh (2008) indigenous hunting is in fact the most threatening anthropogenic process to the entire Australian dugong population accounting for 40% of the total risk from human processes. The largest group of respondents believed that netting posed the greatest risk to dugong populations explaining peoples concern with proposal to re-introduce netting and its potential to further reduce dugong populations, a concern which is valid because where it exists netting is responsible for 32% of the total risk from human processes.

Russell Butler was interested in knowledge of the TUMRA and locals' opinions of the TUMRA. Despite the signs advertising the TUMRA at local boat ramps and the local attention from the media there is still a low level of familiarity among respondents of its presence. Increasing local knowledge of the TUMRA may help to dispel some of the misinformation regarding dugong hunting. For example increased information on the TUMRA may reduce the 14 percent of respondents who felt that the most threatening anthropologic activity in the Hinchinbrook area was indigenous hunting.

Section 5.3 - Perceived Increase or Decrease of Dugong Populations and Dugong Sightings

Many of the 87% of respondents who reported seeing a dugong in the Hinchinbrook waterways reported having spotted them on multiple occasions. The second highest percentage of sightings were in Missionary Bay which reiterates Preen's 2000 argument that Missionary Bay is an important dugong habitat and needs to have initiatives in place that reduce the impact of boats on the resident dugongs.

Forty two percent of respondents believed that dugong populations have increased in the past five years but only 34% believe that they will continue to increase in the next 25 years. Some factors that could contribute to this perceived increase are, greater awareness of the dugongs and therefore a greater likelihood to watch for and identify them while on the water. The perceived increase could also have resulted from dugongs becoming accustomed to boats and not exhibiting evasive behavior as quickly. The last three possibilities are that people were telling the researcher what they thought she wanted to hear, changing information to reflect an increase which would show that guidelines are working and no more conservation initiatives need to be put in place, or there could have actually been an increase in populations. The last option is however unlikely based on populations trends identified by Marsh and the maximum 5% population increase under optimal conditions (Marsh, 1995).

Twenty Six percent believed the dugong population will decrease in the future, an option which is quite possible if human impacts on the Hinchinbrook waterways and on the dugongs themselves continue.

Section 5.4 – Examination of Unsolicited Comments

The comments show a trend among boaters of disagreement with indigenous hunting of dugong. Many people expressed the view that hunting should only occur if traditional hunting methods were being used. After completion of the questionnaire, the researcher further questioned subjects regarding this view. Respondents replied that hunting in tinnies didn't give the animal a chance to get away and this would lead to over harvest. When questioned regarding the implementation of restrictions on take which would serve the same long-term function as having aboriginal people hunt using traditional

methods, many people were confused and said they had never though of it in that way before. Respondents also expressed the opinion that the dugongs were being hunted for sport in some area, simply because it was still legal. These comments lead the researcher to believe that there is simply a lot of misinformation regarding indigenous hunting of dugong and a lot of people who haven't looked at the multiple sides to the argument. Hopefully an educational program could help to change some of these views.

Other comments pertained to the potential for mesh netting to be reintroduced in to the channel and a general worry of what the impact of this would be. Whatever the final decision within the Department of Primary Industries is, local people should be informed not only of the decision but also of how it was reached. If reintroduction of netting is seriously being considered extensive testing of the potential side affects should occur before the decision is made.

There is a split among respondents about whether enforcing the speed guidelines and transit lanes would be a positive or a negative thing. Many people commented that they would obey them if they were made laws but not until then. Although many respondents did not like the idea of them becoming laws and believe that any additional laws or zoning in the area would negatively impact the jobs of professional fishermen and crabbers.

Section 5.6 - Perceptions of Inequality Related to Actions

Alana White (2005) found that a number of people commented on the inequality of having guidelines in place protecting the dugong in the Hinchinbrook area while hunting of this "mobile marine mammal" (Grech and Marsh, 2008) was still allowed to continue on the Cape York Peninsula and in the Torres Straight. To further examine this view I asked all subjects who reported that they don't follow the conservation guidelines, or don't try to

prevent runoff from their property, whether they would be more likely change their actions if all dugong hunting in Australia was banned outright. No respondents reported that they would be more willing to help with conservation by following the guidelines and many commented that they felt the two issues were completely unrelated. The results show that even the people who disagree with any indigenous hunting of dugong (an observation based on unsolicited comments) would not change their personal actions if the hunting was discontinued. This could mean that local people have changed their attitudes since White's 2005 study, or that they were simply using indigenous hunting as an excuse to continue with their destructive actions when questioned in the past.

Section 5.7- Examination of cross-tabulations

There is a larger percentage, of transit lane non-followers in the group of people who believe that vessel strike is the most threatening human activity to dugong populations, than in the group who believe that another anthropologic process is more threatening. This is the same for speed guideline non-followers, although the numbers are much closer. With 37.5% of people who believe vessel traffic to be the most threatening activity not following speed guidelines, there must be other views contributing to the non-compliance. One of these views could be the low perceived likelihood of hitting a dugong. White (2005) found that 65% of respondents believed it was unlikely to hit a dugong while traveling above 10 knots over a seagrass bed. One fishermen reported although he had hit dugongs before it was not often enough for him to slow down while over seagrass beds, even though damage was caused to his boat when the vessel strike occurred. Views like this mean that the benefits of having a healthy population of dugongs need to be advertised enough that they are perceived as being worth slight personal inconvenience.

Locals are more likely to dislike the conservation guidelines, than non-locals and people living on their boats. If the dugong became more of a source of income to the wider community, these opinions may change. However, with the turbid water which is not conducive to dugong watching and the large number of resident crocodiles making the area unfit for swimming with the dugongs, this does not seem a likely possibility.

Weekly users of the Hinchinbrook waterways are the least likely to follow conservation guidelines. Many of these people who are such frequent uses may believe that they know better where the dugongs are located or use the area for commercial purposes and will loose money or be less efficient if they follow these guidelines. This is the group that future efforts to increase compliance of guidelines should focus on.

Daily users show a high rate of using the guidelines indicating either high concern for the conservation of the dugong or that they are telling the researcher what she wants to hear.

Section 5.8 - Feasibility for Creation of a Dugong Conservation Group and Conducting a Full Community Survey

The Tree-Kangaroo and mammal group is a primarily community based group with local members who help to raise community awareness and have successfully helped with projects such as “establishing roadsignage in identified areas of high Tree-kangaroo mortality (roadkills) across the Atherton Tablelands” (2000), conducting a the Lumholtz’s Tree-kangaroo community survey, and lobbying for the construction of wildlife tunnels. A community group focused on the conservation of dugongs could accomplish similar goals such as establishing additional signage at boat ramps or in the channel itself and simply raising awareness for the conservation incentives.

The current conservation group in place, The Alliance to Save Hinchinbrook, has a radical background with many members having participated in the rallies against the construction of Port Hinchinbrook at Oyster point. They also continue to oppose current and future expansion of Port Hinchinbrook keep reports on any environmental impact caused by Port Hinchinbrook.

Another difference is there are more members of the Alliance to Save Hinchinbrook from outside of the Cardwell Shire, than member of the TKMG from outside off the Tablelands. Margaret Thorsborne (Personal Communication) believes that the areas are simply too different for a more similar group to the TKMG to be formed. Too many local people depend on the Hinchinbrook water ways for fishing and crabbing and don't want to see any additional restrictions put in place.

According to John Winter (personal communication) the full community survey was the most useful technique for estimating the population size of Lumholtz's Tree-Kangaroos on the Atherton tablelands because of the shy nature of the animal and their tree top habitat. In his opinion a full community survey of the Cardwell area would have minimal scientific significance for population estimates of an animal that can be surveyed using aerial transects, although the survey could provide information on dugong behavior, such as response to boats. A full community survey would also raise further awareness of the conservation initiatives in the area and of the dugong's vulnerable status and need for conservation. A community survey was conducted by Tony Preen in 1997, the same year of the opening of Port Hinchinbrook, with the results published in his 2000 paper *Dugongs, boats, dolphins and turtles in the Townsville-Cardwell region.* A change in residents in the Cardwell area could have occurred because of this new development and a future

community survey could be conducted targeting the Port Hinchinbrook community specifically or they could simply including in the Cardwell survey area. A full community survey would be a long process (the Lumholtz's Tree-Kangaroo survey was kept by respondents for 18 months) and according to Dr. Winter someone would have to be hired full time to conduct the survey. Additionally residents in the Tablelands are much less affected by Tree-kangaroo conservation than residents in the Cardwell area are affected by dugong conservation. According to Dr. Winter there were a couple of residents who refused to report sightings because they were afraid that if a Tree-kangaroo was spotted on their property the whole area would be turned into a national park, but for the most part people were cooperative in reporting sightings. I encountered three people during my surveying who explicitly told me there were not reporting location of sightings or vessel strikes because they shared this view that any area with reported sightings would be shut down by the government.

Splits in the community occurred during the building of Port Hinchinbrook and some hostilities still remain especially between the Port Hinchinbrook owner and the Alliance to Save Hinchinbrook. These hostilities between both sides have observed by Margaret Thorsborne and can be examined by reading the newspaper articles written by Keith Williams and members of the Alliance to Save Hinchinbrook. These hostilities could prevent the formation of another conservation group and may have an influence on current opinions regarding dugong conservation.

Section 5.9 - Current Management and Education

Pete Kilshaw, a local ranger for the Queensland Parks and Wildlife Service, explained that his department is responsible for not only patrolling the local waters but also

for greeting and helping boaters new to the area while they are on the water. Mr. Kilshaw said they often stop and hand out maps featuring the GBRMPA zoning to new boaters. When the researcher pointed out that these maps do not include the DPA, transit lanes and speed guidelines, but the "Marine Wonders of Hinchinbrook" map/brochure includes both zoning and conservation guidelines, he said he would consider changing his approach and handing out the "Marine Wonders of Hinchinbrook" brochure instead. When the researcher asked about patrols, he explained that most patrols happen on the weekend because limited staff and funding means limited patrols and the greatest number of boaters are out on the weekend so it makes sense to patrol during this time. This self reported lack of monitoring indicated that making the speed guidelines and vessel transit lanes mandatory would be difficult because there would be limited monitoring of the area. Mr. Kilshaw also commented that when the speed guidelines and transit lanes were put in place in 1999 GBRMPA had a large advertising campaign to raise awareness, but since then there has been very little advertising and he believes that the make-up of the group of boaters using the Hinchinbrook waterways most, has changed and that another advertising campaign would increase compliance with guidelines which he reported to be low.

Cardwell state school is currently involved in the reef guardian program which is run by GBRMPA. The school does dedicate part of the semester each year to learning about the reef as well as the Hinchinbrook waterways but the principal hopes to change the program so there is a greater and more specific focus on the reef guardian program in two selected grades. They could then go more in depth about local conservation and management issues.

Section 5.10 - Recommendations for Local Management and Education

1. Make the Speed Guidelines mandatory - Many people verbally expressed that they and other boaters would not follow the speed guidelines until they were made mandatory. This is supported by research in Florida where the speed limits are enforced and the compliance is higher. There is also the possibility of making them mandatory only on weekends and holidays when boat traffic is the greatest and letting them remain voluntary on week days when most commercial fishermen and crabbers use the channel so as not to greatly impact their jobs. This would have the duel advantage of allowing signs to be put in place displaying the speed limits and making the seagrass beds more obvious to boaters.
2. Install markers to alert boaters of the presence of a go-slow zone - According to White (2005) there was a low level of familiarity with the location of seagrass beds and therefore the location of a suggested go-slow zone. Although maps provide some clue as to where the seagrass beds are located, markers are more definitive and can be used by boaters navigating using GPS (which does not show voluntary speed guidelines) as well as boaters navigating using maps.
3. Bring in a representative (such as Russell Butler or Dena Leo) to speak at the Cardwell State School as part of the Reef Guardian program. They could discuss the traditional uses of the Hinchinbrook area and traditional knowledge of animals such as the dugong. Current management of the area could also be included discussing the TUMRA and raising general awareness for this agreement.

4. When the Queensland Parks and Wildlife Service patrollers stop people on the water to ask if they have question and give out maps, have them give out maps that include the Dugong Protection Areas, transit lanes and speed guidelines.
5. Because of the low level of familiarity with the speed guidelines in the Hinchinbrook area I suggest the re-installation of a Dugong Protection Area sign (Figure 6) at the Port Hinchinbrook boat ramp and initial installation at the Meunga Creek boat ramp. The sign at Port Hinchinbrook was removed in the past due to the Port Hinchinbrook owner's disagreement with facts on the sign. A sign has the potential to increase boater's knowledge of the existence of the speed guidelines as well as where they apply. The signs, already located at the Jetty and Marine Parade boat ramp, also provides some information about identifying Dugongs and other large marine animals living in the Hinchinbrook area as well as some information about why their conservation is important. I sent an e-mail to the Port Hinchinbrook Manager Bill Whiteman regarding the absence of a Dugong Protection Area sign (Appendix B). His response (Appendix C) gives permission for the installation of a new sign by GBRMPA. Many people (45%) who had heard about the speed guidelines read about them on a sign or in a brochure, indicating that the addition of a Dugong Protection Area sign at Port Hinchinbrook would be an effective method of advertising to the people who had no familiarity with the speed guidelines.

Section 5.11 - Limitations and Future Research

Future research could examine whether locals have positive opinions of the TUMRA because it allows the Traditional Owners to participate in the management of their

traditional land or simply because it bans the hunting of dugongs which, based on unsolicited comments, most people believe should be banned.

Studies could also further explore the relationship between negative opinions of indigenous hunting and lack of compliance with conservation guidelines. The study could ask a number of less pointed questions examining how indigenous hunting affects perceptions of dugong conservation and how those views influence actions, as opposed to the researches approach of asking outright whether one influenced the other.

A possible limitation is respondents providing the researcher with misinformation because they don't want more restrictions to be put in place.

Differences could exist between people who own different types of boats and these differences could be explored in future research. Biases could have also arisen from these differences such as, boaters with sailboats follow all speed guidelines because their boats generally will not surpass the suggested speed, this however does not mean that they wouldn't go faster if they could.

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Chapter 8. Appendices

Appendix A. Cardwell Dugong Survey

Cardwell Dugong Survey

Hi my name is Matilda Andersson and I am using this survey to conduct research for my final project for my study abroad program based out of Cairns. My research goals are to determine local knowledge, use, and perceptions of the Hinchinbrook waterway, of the conservation initiatives implemented in the area, and of the local marine life, specifically the Dugong. The information that you give me will be kept completely anonymous. The survey only takes about 8-10 minutes of your time, and will help determine the need for more education regarding Dugong conservation in the area. Would you like to take part in the survey?

Date: _____ Time: _____

1) Where do you currently live? _____

Country if outside Australia: _____

2) How often do you [fish and/or boat] in the Hinchinbrook Channel?

Once a Year	Fortnightly
Every 6 Months	Weekly
Every 3 Months	Daily
Once a month	First Time

3) How long have you been coming to the Hinchinbrook area? (years/months total)
_____

4) What is your planned activity for the day?

5) Please check your age group.

Under 15	40-49
15-19	50-59
20-29	60-69
30-39	70+

6) Male or Female (please check one)

7) Have you ever seen a dugong in the wild in the Hinchinbrook area?
Yes No Don't Know

* if yes where were you at the time? _____ (mark on map)

8) How knowledgeable do you feel you are in regards to dugongs? (check one)

Extremely Very Moderately Slightly Not at all

9) In the past 5 years has the local Dugong population

Increased Decreased Stayed the same Don't Know

10) Do you think in the next 25 years the Dugong population in the Hinchinbrook area is most likely to…

Remain stable
Increase
Decrease
Cease to Exist
Don't Know

11) True or False

	TRUE	FALSE	Don't Know
Dugongs are classified as endangered by the IUCN			
The waterways around Hinchinbrook are Dugong Protected Areas			
Dugongs do not migrate from one sea grass bed to another			
Dugongs eat fish like dolphins			
Dugongs are still hunted in parts of Australia			
Recorded Boat Strikes are uncommon in Australia			
Dugongs are currently at 3% of their original population in the Hinchinbrook area.			
Dugongs reproduce quickly			

12a) How familiar are you with the Native Title Hunting Legislation?

Familiar Somewhat Familiar Vaguely Familiar Not at all Familiar

12b) Where did you hear about Native Title Hunting Legislation?

Media	
Signs/ Brochures	
Family Members	
Friends	
Word of Mouth	
Maps/ Charts	
Other (please specify)	_____

13a) How familiar are you with the TUMRA regarding the Hinchinbrook Channel?

Familiar Somewhat Familiar Vaguely Familiar Not at all Familiar

13b) Where did you hear about the TUMRA?

Media	
Signs/ Brochures	
Family Members	
Friends	
Word of Mouth	
Maps/ Chats	
Other (please specify)	_____

14a) How familiar are you the vessel transit lanes used as a conservation measure in the Hinchinbrook area?

Familiar Somewhat Familiar Vaguely Familiar Not at all Familiar

14b) Where did you hear about the vessel transit lanes?

Media	
Signs/ Brochures	
Family Members	
Friends	
Word of Mouth	
Maps/ Chats	
Other (please specify)	_____

15a) How familiar are you with the speed guidelines used as a conservation measure in the Hinchinbrook area?

Familiar Somewhat Familiar Vaguely Familiar Not at all Familiar

15b) Where did you hear about the speed guidelines in the Hinchinbrook area?

Media	
Signs/ Brochures	
Family Members	
Friends	
Word of Mouth	
Maps/ Chats	
Other (please specify)	_____

Background Information:

Native Title: Preserves Indigenous peoples rights to hunt, fish, gather or undertake other cultural or spiritual activities where these activities would normally be restricted by Commonwealth, State or Territory legislation.

TUMRA: A TUMRA is a voluntary agreement created by a Traditional Owner group and accredited by GBRMPA. The Girringun Aboriginal Corporation has a TUMRA in place that bans all Dugong hunting in the Hinchinbrook area.

Speed Guidelines: Voluntary guidelines asking boaters to travel at or below 10 knots over sea grass beds.
Transit Lanes: Voluntary guidelines asking boaters to follow markers that form a lane on the north side of Hinchinbrook Island.

Personal Opinion:

16) I feel _____ about

	Positively	Negatively	Unsure
Native Title			
TUMRA			
Transit Lanes			
Speed Guidelines			

17)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Dugongs are an important part of the ecosystem.					
Dugongs are important in bringing tourists to the area.					
Dugong conservation is over publicized					
It is everyone's responsibility to protect Dugong populations					
I am willing to alter my actions to preserve Dugongs					

18) Of the following 5 human activities, which is the most threatening to dugong populations across their entire Australian distribution, (Morton Bay to Shark Bay)

Indigenous hunting ____
Netting (mortality caused by gill and mesh nets) ____
Trawling (can damage bottom habitats) ____
Vessel traffic (boat strikes and displacement from habitat) ____
Terrestrial runoff (which causes sea grass habitat loss) ____

19) In your opinion which of the above human activities is the biggest threat to the <u>Hinchinbrook area</u> Dugong populations?

_____

20) Have you ever seen of heard of people using gill nets illegally?

No Yes * if yes specify where (if known) _____

21) Have you ever hit a Dugong when boating or ever heard of anyone that has?
No Yes * if yes specify where (if known) _____

22) I currently (check all that apply)

Follow all voluntary speed guidelines in the Hinchinbrook area.
Use the vessel transit lanes around Hinchinbrook Island.
Actively attempt to prevent runoff from my property.
Call the local authorities to report any illegal hunting or fishing.

23) * If you answered no to the corresponding question above and the following, If <u>all</u> Aboriginal hunting of Dugong was banned in Australia would you be more likely to help with conservation by (check all that apply)

Following all voluntary boating speed guidelines to give Dugongs time to react to approaching vessels.
Using the vessel transit lanes around Hinchinbrook Island to reduce the chance of hitting a Dugong.
Actively attempting to prevent runoff from your property by planting tree and shrubs etc
Calling the local authorities to report any illegal hunting or fishing

THANK YOU!

Appendix B.

Matilda's Letter to Port Hinchinbrook

I was wondering if someone could forward this message on to Mr. Williams or whoever is currently in charge of the Port Hinchinbrook boat ramp.

I have been doing research of local people's knowledge of dugong conservation in the area for a final project for school, and I just wanted to make you aware of the fact that there is no sign at the Port Hinchinbrook boat ramp alerting people to the presence of dugongs or the dugong transit lanes and speed guidelines. I have heard stories from a handful of boaters about the huge amount of damage inflicted to their boats when they accidentally hit a dugong. I would imagine that you would not want visitors to have to deal with a damaged boat or have to experience hitting a dugong while visiting the area. These signs are located

at the other two boat ramps and at the public jetty and not only provide suggested ways to avoid hitting a dugong, turtle, or dolphin, but also provides some background information about these animals and ways to identify which seems like helpful information for someone new to the area. You have deemed the dugong special enough to have a statue of one located at the entrance of your community and I though you might like to make the public aware of how to spot and avoid them. I'm sure GBRMPA, who has installed the other signs, would be willing to install one at your boat ramp as well.

Sincerely,

Matilda Andersson

Appendix C.

Bill Whiteman's Response

Dear Matilda,

Thank you for your message about protecting Dugong and the need for a boat ramp sign.

Our company has no objection to the erection of an advisory sign at the Port Hinchinbrook boat ramp and we agree that this would be good idea. The signs that you refer to are printed and installed by the Marine Park Authority.

We do distribute the Dugong Protection Area Maps that advise vessel operators about Dugongs, Turtles. Dolphins and other marine wildlife. On our vessel day tours we always mention Dugong and Turtles. We do regard Dugong as very special and we certainly support the signage that might help to protect them.

It is interesting that you mention that private boat operators have talked about hitting and injuring Dugong.

It is very important that any Dugong strike is reported and there is a hotline telephone number to call or it is as simple as going into the Information Centre near the Cardwell Jetty and giving the details.

To the best of my knowledge there has never been a dugong death in the Cardwell region that has been clearly identified as a boat strike.

Some private speed boat operators still choose to ignore the Dugong Transit Lanes and operate their vessels at high speeds across the shallow water sea grass areas where Dugong are very vulnerable to boat strike.

Perhaps this might be why some boat operators do not want to report boat strikes although if a Dugong was killed or seriously injured it would be very likely that the body or injured animal would be seen and reported by someone else.

You are absolutely right in expressing your concerns and I want to thank you for taking the time and making the effort to write to our company.

I will contact the Marine Park Authority and advise them that they are welcome to place a sign at the Port Hinchinbrook Boat Ramp.

Kindest regards

Bill Whiteman

General Manager

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