



Australian Government

Department of the Environment and Water Resources

**Marine and Tropical Sciences Research Facility (MTSRF)
June 2007 Milestone Report**

Project 4.8.5: Incorporating stakeholders and their values, knowledge, and aspirations in care and development of the Great Barrier Reef Marine Park Authority

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Summary

The project has met the requirement for Milestone 3 dated June 10, 2007. Analysis of existing data to understand the socio-economic impacts of RAP and gaps in knowledge has commenced. See Appendix 1 for a report outlining preliminary findings and identified knowledge gaps. Work to design and implement the GBR user survey has progressed (see Appendix 2). We have designed and implemented the survey of recreational fishers, and expect to start the surveys for the other sectors (commercial fishing, charter fishing, and tourism) before the next milestone date. Progress briefings to all relevant end-users were provided during the milestone reporting period (see Communications below). A plan for completion of out-year activities was developed as part of the ARP2 process (see Appendix 3).

For reference: Milestone extracted from Project Schedule

Description

Report 3 Submission:

- Preliminary findings of assessment of existing data of influences of Zoning Plan on use of GBRWHA and users including identification of gaps in knowledge.
- Progress briefing for DEH, GBRMPA RACs, CapReef, and industry.
- Report detailing GBR user survey and sampling plan to fill data gaps to meet objective (a).
- Summary of any communication activities undertaken including minutes of meetings/workshops if applicable.
- Plan for completion of out year activities including completion of obj. (a) activities, testing of indicators (obj b) and documenting the social values and concerns etc related to the GBRMP and its use, management, and conservation (obj c)

Summary

Description of the results achieved for this milestone

During this milestone period we designed and implemented a face to face survey of recreational fishers to examine the socio-economic impacts of RAP and collect data relevant to designing and testing socio-economic indicators of resource use. The survey we designed is being used as the basis for similar surveys of commercial fishers, charter fishers, and tourism operators which we are in the process of constructing. We have also commenced an analysis of existing data to understand the effects of RAP (see Appendix 1) and identified gaps in our knowledge that need to be filled with data collected from the user surveys.

Explanation of Activity changes

The Program 8 newsletter article scheduled for this milestone reporting period was delayed due to lack of space in the last newsletter. The article has been prepared and will appear in the next newsletter.

Communications, major activities or events

During milestone reporting period

We continue to send regular project updates via e-mail to our end-user working group which includes representative of GBRMPA, QDPI&F, CapReef/Sunfish, QSIA, AMPTO, the charter fishing industry, DEW, and RRRRC.

Renaë Tobin gave a presentation about the project at the GBRMPA Fisheries RAC in February.

Steve Sutton gave a presentation about the project at a workshop hosted by DEW in March. The workshop was aimed at measuring and understanding the socio-economic impacts of MPAs. The presentation provided an overview of the MTSRF project and how the results of the project will help meet the needs of DEW for their Bioregions Program.

Steve Sutton gave a presentation about the project at the MTSRF socio-economic Integration Workshop in March.

Steve Sutton gave a presentation about the project at the MTSRF Research Synthesis conference in April.

Commencement of data collection for the recreational fishing sector.

During next milestone reporting period

An article (see attachment "MTSRF Program 8") dedicated to describing the project has been prepared for inclusion in the next issue of the Program 8 Newsletter which is currently in production under Project 4.8.8.

Commence data collection (surveys) for the commercial fishing, charter fishing, and tourism sectors.

Appendix 1 – Preliminary Analysis of the Effects of RAP

Objective 1:

Understand and document the impacts of the 2003 GBR Zoning Plan on use (tourism, recreation, and fishing) of the GBRWHA and users.

Methodology:

Existing sources of information will be sourced, collated, and analysed to predict and assess potential impacts of the 2003 GBR Zoning Plan on GBR users.

Milestone:

Preliminary findings of assessment of existing data of influences of Zoning Plan on the use of GBRWHA and users including identification of gaps in knowledge.

1) Commercial fishers

a) Potential impacts:

Numerous reports outlined **potential impacts** of RAP on commercial fishers (see Bureau of Rural Sciences 2003; Great Barrier Reef Marine Park Authority 2003; Hand 2003). General predictions of impacts from these reports include:

- While all industries operating in the Marine Park are potentially affected by the proposed changes in zoning, the commercial fishing industry is likely to be most affected. However, there may be long-term benefits to the commercial fishing industry in the GBR.
- Impacts of closures will affect approximately 10% of GVP, ranging from \$10.3 million and \$13.7 million annually. On a value-added basis (VA, i.e. the value over and above the costs of fishing effort) the value of the areas to be closed to fishing is estimated at about \$2.59 million per annum.
- The average potential impact per town is where approximately 10% in commercial fishing GVP, with individual estimated impacts ranging from 6.7% to 12.9%. However, in some cases the estimated impact is small in absolute terms, or the commercial fishery has alternate sources of catch outside the GBRMP.
- The total GVP from fisheries constitutes less than 1% of the GBR catchment economy although the impacts on persons in the fishing industry adversely affected by changes are obviously of great significance to those individuals concerned. Commercial fishers are located right along the Great Barrier Reef coastal strip. Commercial fishing has strong historical links in coastal communities, and for many is considered a defining industry in the livelihood and character of the region. Fishing businesses tend to be small, owner-operated family businesses, often with a strong generational link to particular fishing grounds. A comprehensive understanding of social impacts would **require targeted research at the community level, including surveys and community consultation.**
- There is a range of possible responses from individual fishers to reductions in resource access. These responses for individuals include:
 - Changing their fishing location;
 - Increasing effort to maintain production;
 - Changing the nature of their operation, for example, shifting operations to higher value outputs such as offered through the live fish trade;

- Leaving the fishing industry altogether.
- Previous studies of social impacts in fisheries have pointed to the clear preference shown by fishers to remain in the industry, even in the face of declining returns. Increased pressures on business viability and reduced disposable income are likely to be felt both at the family and the broader community level. If individuals and their families leave the industry, and possibly the region, this will have impacts on diversity and social capital, potentially making the region more reliant on remaining industries and more vulnerable to short-term downturns in remaining industries. The strong self-identification of fishers with their industry also points to the potential for increased feelings of alienation if commercial fishing options are no longer available. Responses such as shifting effort can involve increased travel and running costs, and potentially lead to greater pressure on remaining areas and greater competition with commercial and recreational fishers for access.
- The extent to which the proposed zoning plan will impact on some fishers will vary depending on:
 - The percentage of the fishery being located in the new protected zones;
 - The sustainability of fisheries under existing fisheries management arrangements and industry practices;
 - The availability of alternative fishing grounds;
 - Search costs associated with locating suitable new fishing grounds;
 - The mobility of fishers;
 - Impact of changes in patterns of fishing effort in those areas where fishing activity may be displaced;
 - Spill over and recruitment benefits from protected areas;
 - Dependence of fishers on GBR fisheries income compared with other sources of income;
 - Recent Qld fishery management changes;
 - Age of fishers;
 - Number of dependents;
 - Diversity and robustness of the local economy.
- There are potential social impacts on those fishing communities with high dependency on the GBRMP. Changes to resource access can be expected to have the greatest potential social impact for those 13 towns that rely solely or heavily on the GBRMP for their commercial fishing activity (based on information from Fenton and Marshall 2001). Factors which will influence the level of impact on individuals and specific fisheries are:
 - their capacity to shift effort;
 - ability to change the nature of their fishing operations; or
 - ability to take other mitigating action; and
 - Their individual resilience to change.
- These factors were considered through a mobility index based on capacity to shift efforts and a family resiliency measure (which included socio-demographic factors such as age and family structure, income, housing and employment, and education) to examine the ability of fishing families operating in the GBRMP to manage changes in the level of access to fisheries resources.
 - When comparing the mobility of fisheries using a Grid Mobility Index, 10 of the 20 Town Resource Clusters had comparably high levels of mobility, indicating greater capacity to offset potential impacts to production through changes to fishing locations. Those with higher mobility also tended to be those with higher absolute gross values of production, consistent with greater production reflected in increased area of operation. Those Town Resource Clusters with fisheries characterised as having low

mobility, and which also had a high level of activity in the Marine Park for their commercial fishing activities, were Airlie Beach, Ayr, Bowen, Cooktown, Innisfail, Lucinda, Port Douglas and Yeppoon.

- Regarding the family resilience measure, fishing families least resilient to change are those in Bowen, Cooktown, Maryborough and Yeppoon. However, with the exception of Bowen, these towns have a low level of employment in agriculture, fisheries and forestry and account for only a very small amount of the total value of fishing in the Marine Park.
- Communities also vary in terms of their resilience to change depending on their social and economic characteristics and this will influence the way they respond to changes in the value of fishery production. A regional-based index of resilience to change (comprising variables such as housing, age, labour force, occupation, weekly incomes, education, family and Indigenous persons) was used to assess likely regional impacts.
- Of the regions and communities identified as less resilient, potential impacts for Bowen appear higher than for other areas. Within other regions, such as Yeppoon, there may be substantial impacts on individuals or particular fisheries, due to differing dependence on rezoned areas.
- However, **the impact on individuals and communities cannot be quantified without further analysis.**
- The level of fishing activity is likely to be unaffected by the Zoning Plan, only the catch rates. This may affect profitability.
- Analysis at the Town Resource Cluster level does not allow for impacts on individual fishers to be fully assessed. A township's commercial fishing activity may comprise a range of fisheries with different spatial coverage and hence potentially variable zoning impacts, different characteristics in terms of equipment and infrastructure and different options in terms of mobility.

b) What is known:

- Of 583 tenders received by QRAA, 114 licences plus four additional separate RQ endorsements with quota attached were purchased at a cost of \$31,849,689 (QSIA 2004).
- Effort reduction targets were met for the whole of the marine park, but there is some variability in the amount of effort purchased at the regional level relative to the impact of the rezoning. Some regions had a lot more buy-outs than was targeted for, others less than the target (QSIA 2004).

c) Knowledge gaps:

- What is the cost of GBRCMP? Most reports seem to think inshore fisheries will feel minimal impact from RAP, but the Coast Marine Park was not considered.
- What is the effect of yellow zones?
- There is a lot of information on potential impacts (positive and negative), but no investigation of actual impacts.
- Changes in licence # – don't know if they're directly related to RAP. Need to talk to fishers, including those who left the industry.
- There was no analysis of buy-outs within the line fishery specifically due to confounding issue of quota introduction – the effect of RAP needs assessing by talking to fishers.

- Don't know how many fishers wanted to be bought out but were unsuccessful in their tenders. Some of these may have later sold their licences – need to talk to these fishers.
- Information on which most pre-RAP reports were based on is from Fenton and Marshall 2001. No post-RAP information to the same level or collecting similar information.
- Buy-out information is for business address, not fishing location. Need to investigate effort reductions in actual fished areas, including whether there is now effort concentration in some areas and how that affects fishers.

2) Charter fishers:

a) Potential impacts:

Hand (2003) provided a report by PDP Australia to estimate the potential impacts of RAP prior to implementation. They found:

- The annual GVP of the charter and game fishers that operate in the Marine Park is approximately \$50 million. Revised Zoning Plan closes 13% of sites that charter fishers may currently access, and covers 17% of days fished prior to RAP implementation.
- They suggested the charter fishery had a high degree of adaptability to RAP, based on:
 - Offshore and coral reef components of the charter fishery are highly mobile and can use alternative areas if areas they now fish are zoned Green;
 - A significant amount of income is derived from non-fishing passengers; for example, some boats may be chartered for dive trips;
 - Charter boats operating in areas adjoining protected areas will, over time, experience positive spillovers as abundance of target species is expected to increase in these areas;
 - Most coastal and estuarine charters will not be affected by the zoning proposed in the Zoning Plan Because rivers, creeks and intertidal areas are not in the Marine Park; and
 - Management changes in the recreational coral reef finfish and Spanish mackerel fisheries introduced by the Queensland Government.
- The components of the charter fishery that operate in the Marine Park with the least potential to adjust their local operations are inshore boats from coastal communities that target local fishing spots and some single-day reef fishing charters that can reach inshore reefs.
- Most of the potential affect of the Zoning Plan is in the Offshore Gladstone/Mackay Area in the Capricorn Bunker Group of Reefs and Swains Reef complex, and some specific localities in the Whitsunday area and reefs off Cairns.

b) What is known:

- Number of charter fishing permits in years pre- and post-RAP are available. We have requested this information from QDPI&F but have not yet received it.

c) Knowledge gaps:

- How do the expected changes in fishing days and area compare to actual changes? Have fishers been able to successfully move operations from previously fished areas that are no in no-take zones?
- How mobile are charter fishers? This will affect the level of impact.
- What is the impact on inshore charter fishers from the GBRCMP?

- If there is a change in permit number, how is this related to RAP? Need to talk to the fishers, including those that left the industry post-RAP.
- What are fishers' attitudes towards RAP?

3) Recreational fishers

a) Potential impacts:

GBRMMPA (2003) and Hand (2003) provided an estimate of potential impacts of RAP on recreational fishers. They found:

- Based on three sets of data (Suntag, boat ramp information and RFISH data), all indicate that the revised Zoning Plan will have minimal impact on recreational fishers even if anecdotal information suggests that these data are slight underestimates.
- GBRMMPA has estimated that new areas within the Marine Park where recreational fishing would not be permitted under the Zoning Plan are located where approximately 4% of recreational fishing takes place. Hence negative impacts on recreational fishers are expected to be low.
 - The Sunfish tag data consisting of point data – In the proposed Zoning Plan, Marine National Park, Preservation and Scientific Research zones are also closed to recreational fishing. There are 485 fishing locations representing approximately 1% of total fishing locations within these zones. From these data, it may be concluded that the proposed Zoning Plan will have minimal impact on recreational fishers.
 - Boat ramp point data from Queensland Transport (QT) and Surf Life Saving Club (SLSC) Association showed some 169 km² (or 4%) of closed zones are situated within 5km of Queensland Transport boat ramps. Assuming the location of recreational fishing activity is linked to proximity to boat ramps, these data suggest that under the Zoning Plan Green Zones would be placed where less than 5% of recreational fishing activity occurs. While use of boat ramp data in this way is an imprecise means of estimating impacts on recreational fishing, it indicates likely low impact given that 80% of recreational fishing vessels are under 5.1 m in length, and therefore unlikely to travel great distances from shore. The National Recreational Fishing Survey [2003] also showed that only 6% of recreational fishing effort in Queensland occurred more than 5 km from shore including fishing effort originating from communities adjacent to the Marine Park.
- GBRMMPA concluded that less than one in ten fishing spots in the Marine Park may be unavailable for fishing and that, regardless, most of the fishing happens in creeks and estuaries outside the GBRMP.
- The main recreational fishing areas affected by the Zoning Plan are inshore areas in the Rockhampton, Whitsunday, Townsville, Innisfail and Cairns regions, and reefal and shoal areas in the Capricornia Bunker reefs area off Gladstone, Townsville and Cairns.
- Conversely, in Conservation Park Zones (Yellow Zones) recreational fishing will still be permitted (subject to restrictions) but only limited commercial fishing will be permitted. Some recreational fishers may therefore experience less conflict with other fishers and therefore may realise benefits from introduction of the Zoning Plan. Further, with less fishing effort in Yellow Zones, some recreational fishers may experience higher quality fishing experiences due to the possibility of increased abundance of target species.
- The number and location of registered vessels is a good indicator of the importance of recreational fishing to regional economies.

b) What is known:

More data exist for the recreational fishing sector than for the other sectors. Recreational fishing data come primarily from the Queensland Government’s RFISH surveys, and from two recent social surveys of recreational fishers in Queensland funded by the CRC Reef Research Centre. One of these CRC Reef surveys was conducted shortly before RAP was implemented, the other is currently being conducted in conjunction with the CApReef project to assess the social impacts of RAP on recreational fishers. Preliminary results of that survey indicate that the majority (70%) of recreational fishers in the GBR area support the idea of rezoning the GBR and that most (75%) believe the new zoning plan will help maintain the GBR in healthy condition. Approximately 50% of recreational fishers reported experiencing no impacts from the rezoning; 25% reported experiencing negative impacts, and 25% reported experiencing positive impacts. Although support for the rezoning plan was high among recreational fishers, only 40% believed that the concerns of recreational fishers were adequately considered in the rezoning process.

Vessel Registration Levels for Great Barrier Reef Coastal Communities is available on the web at:

http://www.gbrmpa.gov.au/corp_site/key_issues/tourism/management/gbr_visitation/rec_vessels

This site shows a steady increase in the total number of registered motor boats since 2001, with no obvious change in July 2004 when RAP was introduced (see Figure 1).

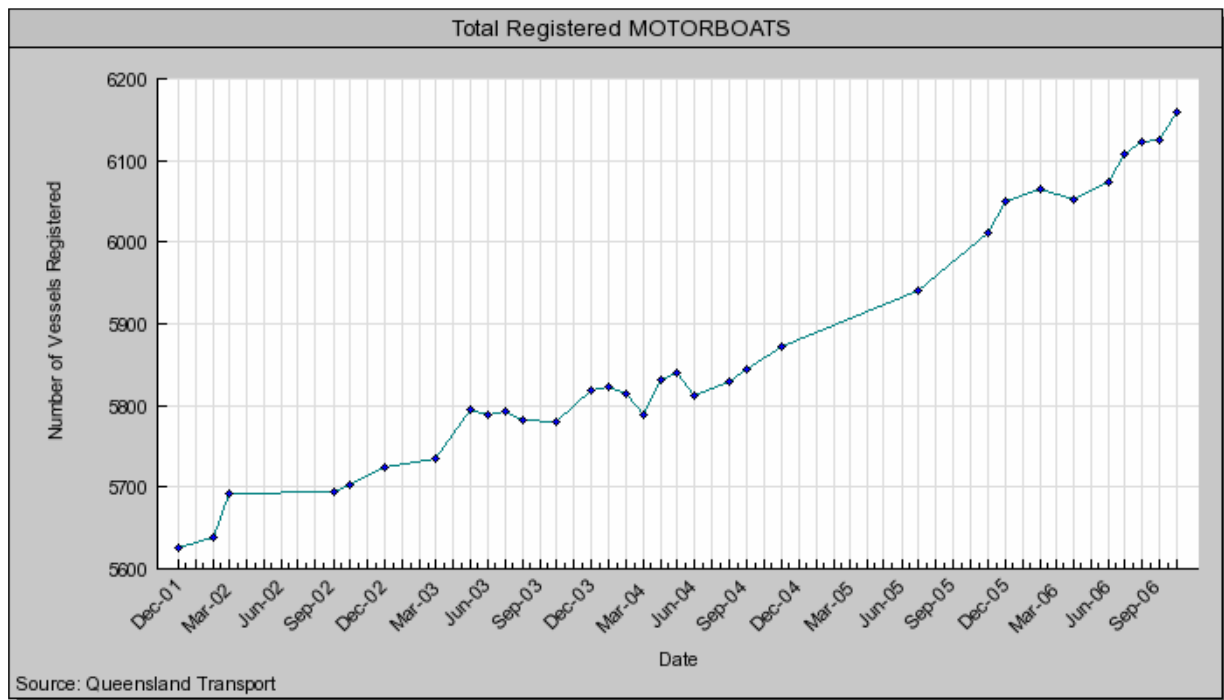


Figure 1: Total registered motorboats registered within GBR coastal communities from Dec 2001 to Sept 2006.

However, when the graphs for vessels over 5 m are examined, there is a sharper increase in number of registered vessels since RAP introduction (though not necessary immediately after RAP introduction) particularly for the larger boats (over 8 m) (See Figure 2 for example).

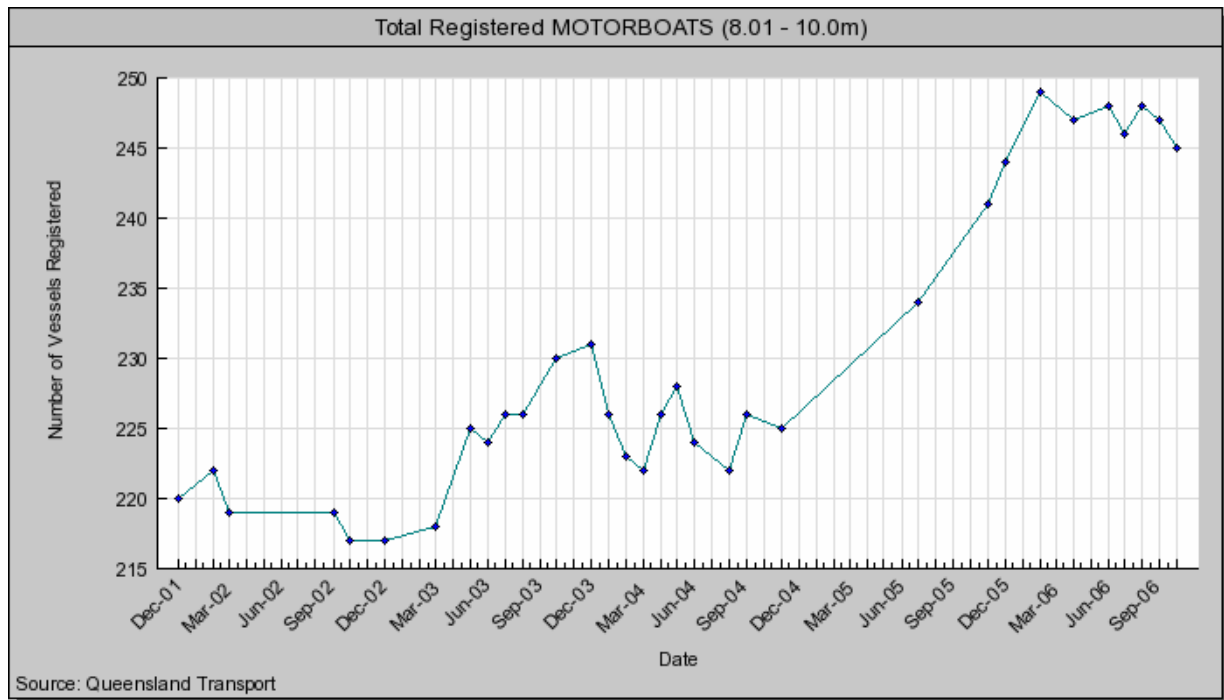


Figure 2: Number of registered motorboats, 8-10 m in length, registered within GBR coastal communities from Dec 2001 to Sept 2006.

c) Knowledge gaps:

- What amount of fishing area is affected by the mirroring GBRCMP?
- What is the actual change in fishing area? Has this affected fishing activity?
- What are the changes in recreational fishing effort distribution and other activity patterns due to new zoning?
- Have there been positive effects noticed from the yellow zones?
- Is the increase in larger motorboat registration related to RAP or other factors? Are these motorboats for fishing?
- What is the level of recreational fishing participation in Queensland post-RAP (awaiting RFISH results)? Is this related to RAP?

4) Tourism operators

a) Potential impacts:

GBRMPA (2003) and Hand (2003) provided an estimate of potential impacts of RAP on the tourism industry. They found:

- Tourism, the third most important industry in the GBR catchment area, is worth well over \$4,000 million GVP and will benefit from implementation of the RAP.
- A good indicator of the level of tourism in the Marine Park is the number of visitors using commercial reef-tour operators, which, in 2001-02, was 1.8 million.
- The health of the GBR afforded by the Representative Areas Program will encourage domestic and international visitors to choose the Marine Park over other destinations. Given the increased attractiveness of a well-maintained reef ecosystem when many other

reefs around the world are suffering from degradation, visitor numbers to the GBR are likely to increase. Even a minor increase in visitor numbers, such as 5%, would represent a considerable boost to the economic impact of the tourism sector in the region.

- Overall, GBR catchment tourism is forecast to grow by 15.4% over the period 2001-10 and 30.5% over the period 2010-20, giving total forecast growth for 2001-20 of 50.6%.

b) What is known:

Permit numbers from GBRMPA:

- Table 1 below shows the number of new permits granted in recent years. While there is a slight increase in the number of permits granted, this is variable year-to-year.

Table 1: The number of new GBRMPA tourism operator permits granted in each financial year from 2003/04 to year to date (2006/07).

Financial Year	Tourism Permits	Permits involving fishing
03/04	244	154
04/05	274	173
05/06	256	165
06/07 (ytd)	282	205

- The current number of valid permits is 1054, of which 711 are allowed to fish.

Visitor numbers from GBRMPA EMC data:

- There was a slight increase in visitor number for the 2003 (of which half was post-RAP) and 2004 calendar years. This decreased again in 2006, but this may be due to incomplete data entry (Gillian Goby, GBRMPA, pers. comm.) (See Figure 3).

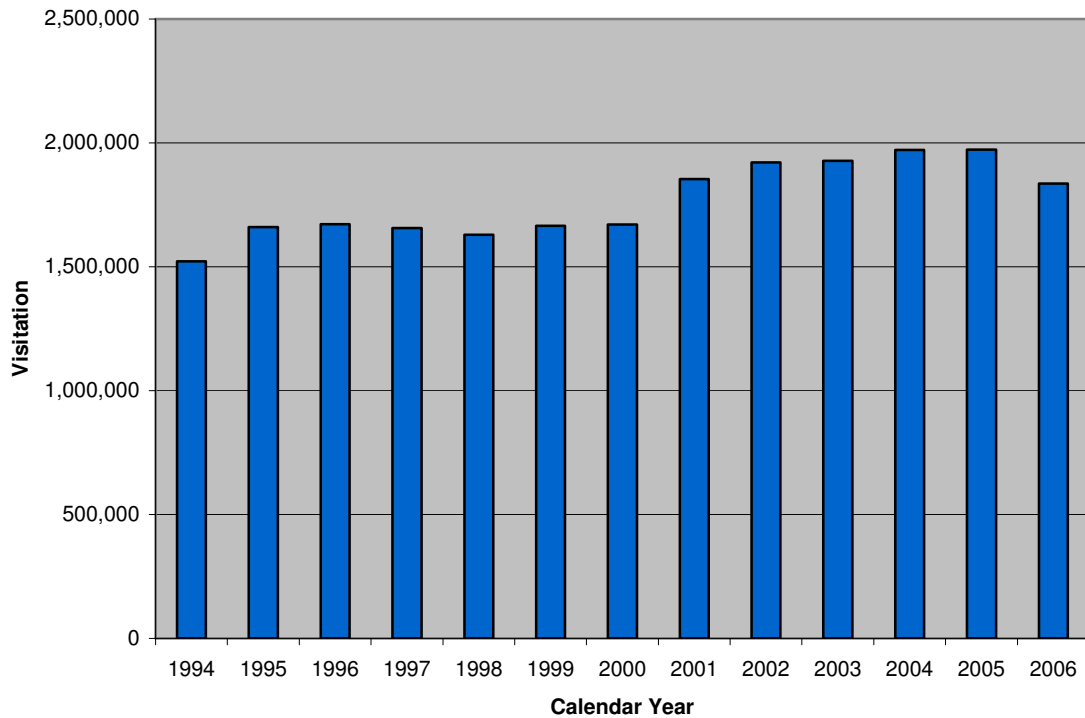


Figure 3: Reef Wide Visitation to the Great Barrier Reef by Year from 1994 to 2006. From GBRMPA EMC data.

c) Knowledge gaps:

- Are changes in visitor number significant? Have changes in visitor number been related to RAP? Need to collaborate with Bruce Prideaux to determine visitors' reasons for visiting the GBR.
- Have operators changed visiting areas or any of their practices as a result of RAP?
- What are operators' attitudes to RAP?

References:

Bureau of Rural Sciences 2003. *Implementing the Representative Areas Program in the Great Barrier Reef Marine Park. Assessment of potential social impacts on commercial fishing and associated communities.* Department of Agriculture, Fisheries and Forestry, Commonwealth of Australia, Canberra. 46pp.

Fenton, DM and Marshall, NA 2001. *A Guide to the Fishers of Queensland. Part A: TRC-Analysis and Social Profiles of Queensland's Commercial Fishing Industry.* CRC Reef Research Centre Technical Report No. 36, CRC Reef Research Centre, Townsville. 207pp.

Great Barrier Reef Marine Park Authority 2003. *Summary report of the social and economic impacts of the rezoning of the Great Barrier Reef Marine Park.* Great Barrier Reef Marine Park Authority, Townsville. 10pp.

Hand, T 2003. *An Economic and Social Evaluation of Implementing the Representative Areas Program by Rezoning the Great Barrier Reef Marine Park.* Report on the Revised Zoning Plan, for the Great Barrier Reef Marine Park Authority, PDP Australia. 79pp.

QSIA 2004. *GBRSAP: Results of Buyback Scheme – Initial Summary.* Queensland Seafood Industry Association.

Appendix 2 – GBR User Survey

As part of MTSRF Project 4.8.5, we are conducting face-to-face interviews with a sample of recreational fishers, charter fishers, commercial fishers, and marine tourism operators to measure and document the positive and negative effects of the RAP on their use of the Marine Park. These surveys are scheduled to be conducted from June 2007 through to June 2008. Details on the design and implementation of these surveys are as follows:

Recreational fishers

To date, we have designed, tested, and implemented the survey of recreational fishers (see survey instrument below). The primary purpose of this survey is to collect information about changes in fishing activity due to the RAP. This builds on the extensive attitudinal data already collected from the recreational sector as part of a previous CRC Reef funded project. Survey participants are being identified through contacts with fishing clubs and tackle shops. We will shortly be trialling a boat-ramp survey in the Townsville area to determine whether we can recruit survey participants in this way. The survey is currently underway in Townsville and Rockhampton (in conjunction with CapReef) with plans to expand to Cairns and Mackay-Whitsundays before the end of 2007.

Commercial fishers, charter fishers, and tourism operators

A face-to-face survey of commercial fishers, charter fishers, and tourism operators is being developed based on the recreational fishing survey. Fewer pre-existing data are available for the commercial fishers, charter fishers and tourism operators, therefore it is necessary to expand the scope of the survey for these sectors to collect additional information, especially economic data. These additional questions are being formulated in consultation with representatives of each sector. For the tourism operator sector, we will linking with project 4.8.6 to the greatest extent possible to ensure that data collection efforts are not duplicated. We have confirmed that a list of current licensed commercial and charter fishers will be made available to us by QDPI&F. This list will be used as a sampling frame from which we will select a random sample of fishers to interview. Tourism operators will be identified through AMPTO and in consultation with project 4.8.6.

MTSRF Recreational Fisher Survey

Date: _____

Id: _____

Gen: M F

A. Fishing participation

1. How often did you go fishing in the last 12 months?
 1. Weekly or more often
 2. Fortnightly
 3. Once a month
 4. Less often or on holidays

2. How many days in total did you go fishing in the past 12 months? _____

3. How many years have you been fishing recreationally? _____

4. Compared to other outdoor activities that you participate in (like golf, tennis, camping, etc.), would you say fishing is:
 1. Your most important activity
 2. Your second most important activity
 3. Your third most important activity
 4. Only one of many activities

B. Current fishing locations (for this section and section C, information about fishing locations will be recorded on GBR zoning maps)

5. Please mark on the map your most important saltwater fishing locations/areas within the GBR (these could be your favourite locations, the places where you fish the most, the places where you catch the most fish, etc.).

6. For each location/area marked:
 - How often do you fish there?
 - What species do you target/catch there?
 - Are there any particular reasons why you like to fish there? (i.e., high catch rates, accessibility, target species, lack of other fishers, etc.)

C. Previous/lost fishing locations

The Great Barrier Reef Marine Park has recently undergone a major change with the implementation of a new zoning plan. Under this plan, the amount of 'no-take' areas (i.e., green zones) in the Marine Park was increased from 5% to 33% of the total park area, and the amount and locations of yellow zones was also changed. With these next few questions, we would like to get some idea how these changes in zoning have affected your fishing activity.

7. Are there any locations/areas where you used to fish regularly but now can't because they have been rezoned as "no-take" areas. If so, where? (mark on map)

8. For each location/area:
 - How often did you used to fish there?
 - What species did you catch/target there?
 - Is there any particular reason why you liked to fish there?

9. For the locations you have lost due to rezoning:
 - Have you replaced the lost areas with any new areas that you had not fished previously? If so, where are the new areas (mark on map)?
 - Have you compensated for the lost areas by fishing more at other areas that you used to fish previously? If yes, where are these areas (mark on map)?
 - Has loss of these areas caused you to target/catch different species? If yes, which ones?
 - Are there any other ways in which you have compensated for or adjusted to the loss of these fishing areas?

10. Are there any other ways in which the rezoning of the Marine Park has affected your fishing activity (positively or negatively)?

11. We just went through the exercise where we recorded information about the changes in your fishing activity due to the RAP using maps of the GBR. On a scale of 1 to 5 (where 1= not well at all; and 5 = extremely well), how well do you think we have recorded the spatial changes in your fishing activity due to the RAP?

Not well at all		Moderately well		Extremely well
1	2	3	4	5

If 1 or 2, why?

a. Do you have any concerns about collecting information from you in this way?

D. Attitudes towards rezoning

12. Thinking about the rezoning of the Marine Park, do you think it was a:

1. Very good idea
2. Good idea
3. Neither
4. Bad idea
5. Very bad idea

13. What is your level of approval of the number of green zones in the areas where you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

13b. In what way do you approve/disapprove of the number of green zones?

14. What is your level of approval of the size of green zones in the areas you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

14b. In what way do you approve/disapprove of the size of green zones?

15. What is your level of approval of the location of green zones in the areas you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

15b. In what way do you approve/disapprove of the location of green zones?

16. What is your level of approval of the number of yellow zones in the areas you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

16b. In what way do you approve/disapprove of the number of yellow zones?

17. What is your level of approval of the size of yellow zones in the areas you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

17b. In what way do you approve/disapprove of the size of yellow zones?

18. What is your level of approval of the location of yellow zones in the areas you fish?

1. Strongly approve
2. Approve
3. Neither approve nor disapprove
4. Disapprove
5. Strongly disapprove

18b. In what way do you approve/disapprove of the location of yellow zones?

19. Do you agree or disagree that the concerns of recreational fishers were adequately considered in the rezoning process?

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

20. Do you have any suggestions as to how the concerns of recreational fishers could have been better represented in the rezoning process?

21. Are there any aspects of the zoning plan that you would like to see changed?

F. Changes in fishing activity

22. Over the past three years, has your level of fishing activity increased, decreased, or stayed about the same?

1. Decreased a lot
2. Decreased a little
3. Stayed the same
4. Increased a little
5. Increased a lot

If increased or decreased, why?

23. Over the past three years, has your level of satisfaction with fishing increased, decreased, or stayed about the same?

1. Decreased a lot
2. Decreased a little
3. Stayed the same
4. Increased a little
5. Increased a lot

If increased or decreased, why?

24. Over the past three years, has the quality of fishing in your area increased, decreased, or stayed the same?

1. Decreased a lot
2. Decreased a little
3. Stayed the same
4. Increased a little
5. Increased a lot

If increased or decreased, why?

25. Over the past three years, has the amount of money it costs you to go fishing increased, decreased, or stayed about the same?

1. Decreased a lot
2. Decreased a little
3. Stayed the same
4. Increased a little
5. Increased a lot

If increased or decreased, by how much? Why?

G. Participation in fisheries consultation

26. Do you believe that resource management agencies (like the Queensland Department of Primary Industries and Fisheries or GBRMPA) should consult the public about issues affecting recreational fishing?

If yes, Why?

If No, Why not?

27. Have you ever attended a public meeting or made a submission to a government agency (e.g., Queensland Department of Primary Industries and Fisheries, GBRMPA) as part of a formal consultation process about a fisheries- or marine park-related issue?

1. Yes
2. No

If yes:

- a. What was the issue and how did you participate (i.e., attended public meeting, made a formal submission, etc.).

- b. Did your participation involve the use of maps to collect information from you?

- c. What motivated you to participate?

- d. Do you feel your participation was worthwhile? Why or why not?

If no:

e. Why have you never become involved in fisheries-related issues?

We are interested in finding ways to collect information from recreational fishers that can help fishers become more meaningfully engaged in fisheries and marine park management. One of the things we are interested in understanding is how we can use maps and mapping tools to better represent fishing activity. With the next few questions, we are interested in understanding what kinds of maps and mapping tools you currently use, and why you use them.

28. How much do you use each of the following types of maps or mapping tools in the course of your fishing activity?

	No	A little use	Moderate use	A lot of use
a) a. Paper maps and / or nautical charts.	1	2	3	4
b) b. Chart plotter	1	2	3	4
c) c. GPS.....	1	2	3	4
d) d. Aerial photographs.....	1	2	3	4

e) e. Internet maps (e.g., Google earth) ..	1	2	3	4
f) f. GBR zoning maps.....	1	2	3	4
g) g. Geographic Information Systems (GIS).....	1	2	3	4
h) h. Interactive mapping applications.....	1	2	3	4

(i.e. Coastal Habitat Resources Information System – CHRIS; GBRMPA GIS Zoning maps Deep Blue mapping tool)

For each of the tools listed above that you use (i.e, scored 2 or above), what is the reason you use it (i.e., what kind of information are you looking for from each one (e.g., depth, shoreline structure, submerged structure, navigation information, etc))?

For each of the tools listed above that you do not use (i.e, scored 1), why don't you use it?

- a. Paper maps and / or nautical charts
- b. GPS
- c. Chart plotter
- d. Aerial photographs
- e. Internet maps
- f. GBR zoning maps
- g. GIS
- h. CHRIS

29. Have you ever used geographic information systems (GIS) or related geospatial technologies outside fishing?

If Yes:

- a. Which purpose?

- b. Do you see any way geographical information systems can help you better engage in fisheries management issues?

30. Do you have anything else you'd like to tell us about recreational fishing, the rezoning of the marine park, or anything else related to this survey?

Appendix 3 – Plan for out year activities

Objective	Output / Milestone	Completion Date
(a) (b)	Collate existing information relevant to assessing influence of the Zoning Plan. Conduct the socio-economic indicators workshop. Industry and other end user magazine article. Dedicated program newsletter article.	December 2006
(a)	GBR user survey and sampling plan developed. Commence analysis of existing data and GBR user survey. Briefing to DEW, GBRMPA RACs, CapReef, and industry.	June 2007
(c)	Develop telephone survey instrument. Dedicated program newsletter article. Industry and other end user magazine article.	December 2007
(a) (b) (c)	Complete user interviews and telephone survey. Briefing to DEW, GBRMPA, CapReef, and industry.	June 2008
(a) (c)	Complete data entry into GIS and statistical databases. Dedicated program newsletter article. Industry and other end user magazine article.	December 2008
(a) (c)	Analysis of interview and survey data commenced. Briefing to DEW, GBRMPA, CapReef, and industry.	June 2009
(a) (c)	Complete data analysis. Dedicated program newsletter article. Industry and other end user magazine article.	December 2009
(a) (b) (c)	Technical reports and relevant scientific peer-reviewed publications. Briefing to DEW, GBRMPA, CapReef, and industry.	June 2010