

Process Used to Determine Research Priorities for the Protection and Management of the Great Barrier Reef 2005



Introduction

This document summarises the process used by the Great Barrier Reef Marine Park Authority (GBRMPA) to determine research priorities for the Great Barrier Reef Marine Park. It also details a process for integrating identified research needs with current and planned research activity, to assist in allocating priorities for research investment.

The research priorities were based upon review, by GBRMPA scientists and managers, of the 'Research Priorities for the Management of the Great Barrier Reef Marine Park and the World Heritage Area 2001' (Green et al. 2001). This update took into account emerging issues, and improved structure and integration. Key issues considered included: Importance to the protection of the Great Barrier Reef; National Research Priorities; Legislative and policy imperatives; Community interest; and relative urgency.

Identification of Research Information Needs:

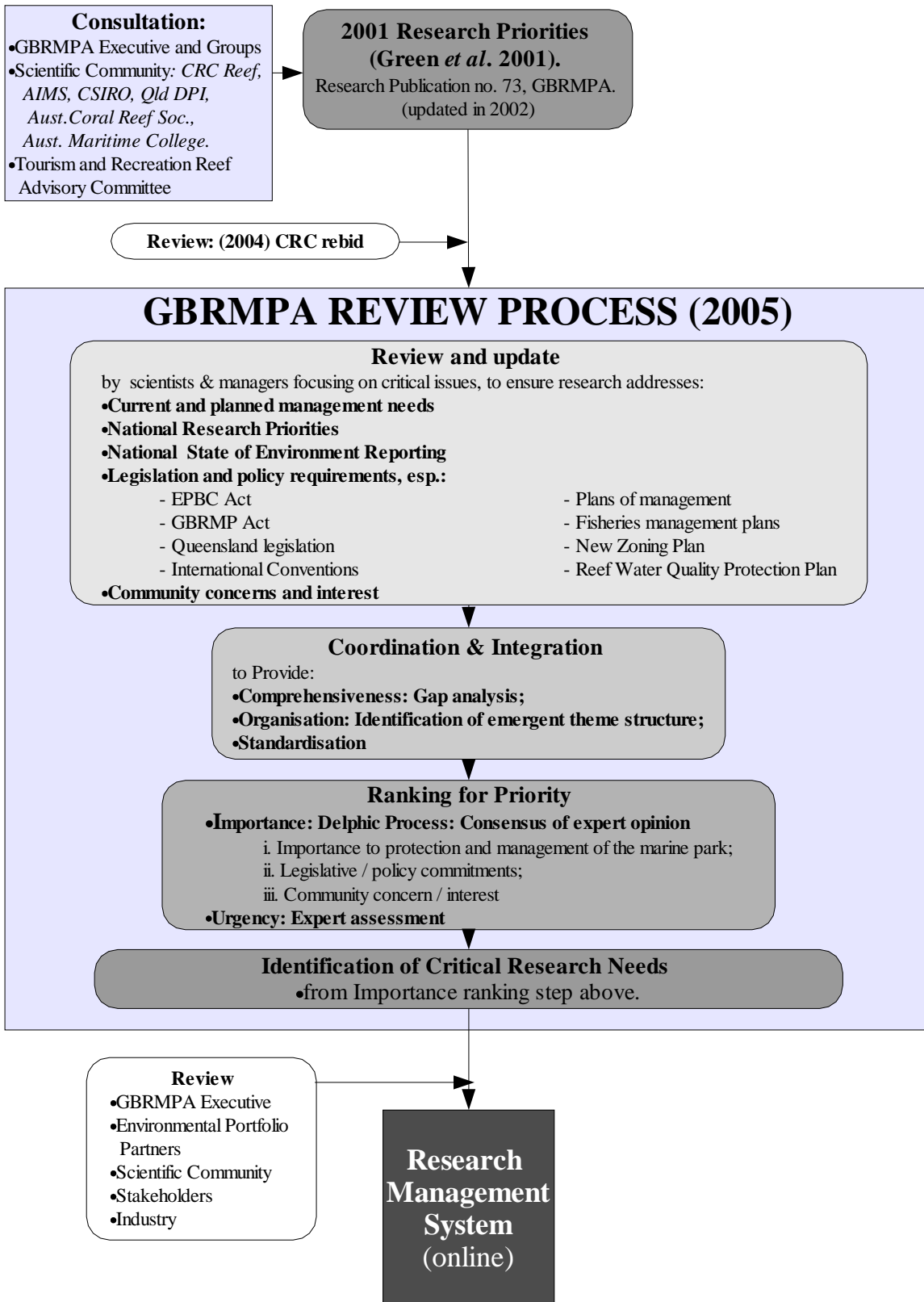
The Research Themes and Questions identified in the main document comprise a significant update and evolution of previously identified research needs, which were themselves the result of careful compilation, consultation and review (Diagram 1).

In 2001, the GBRMPA published a list of research needs 'Research Priorities for the Management of the Great Barrier Reef Marine Park and World Heritage Area 2001'. (Research Publication 73: Green et al. 2001; published also on the GBRMPA's external web site). That list was derived from extensive consultation, including with staff of the GBRMPA, a range of the scientific community (including the Cooperative Research Centre for the Great Barrier Reef World Heritage Area, the Australian Institute of Marine Science, the Australian Coral Reef Society, CSIRO, Qld DPI, and the Australian Maritime College), and the GBRMPA's Tourism and Recreation Reef Advisory Committee. The list was updated in 2002, based on informal review and discussion with the wider scientific and stakeholder communities, and on further consultation with the Critical Issues and other Groups within GBRMPA. In 2004, the GBRMPA Groups reviewed their research needs in the context of the rebid for the CRC Reef Research Centre.

The present Research Themes and Questions are based on substantial revision and evolution of the previous list, to address the following needs:

- Comprehensive review and update by the Critical Issues Groups and other sections of GBRMPA, to ensure the list comprehensively addresses the *current* needs for protection and wise use of the Great Barrier Reef Marine Park;

Diagram 1: Identification and Priority of Research Information Needs



- Consideration of links to National Research Priorities, National State of the Environment Reporting, the GBRMPA's Key Performance Indicators, International Conventions, The Environment Protection and Biodiversity Conservation (EPBC) Act 1999, and other legislative and policy requirements or commitments.
- Synthesis to provide a single 'reef-wide' /agency-wide list (removing overlaps and duplication in questions identified by different groups within the GBRMPA; improving standardisation in terms of detail and style);
- Re-expression of specific information needs as 'Research Questions' (to denote their status as an information need; these were previously expressed as 'Tasks', which were more prescriptive and risked pre-empting innovation in methods etc.);
- Identification of emergent 'Research Themes' to provide structure, organisation and synthesis to the list of very detailed and specific questions; whilst
- Maintaining the valuable detail and specificity of the 'Research Questions' (required to avoid ambiguity in interpretation by researchers);
- Clarification of priority into Importance and Urgency (the timeframe over which the information is required);

The resultant Themes and Questions, and their associated priorities, were then again reviewed by GBRMPA scientists and managers. Further feedback will be sought through consultation with stakeholders, research providers and Environment portfolio partners.

Prioritisation of Research Information Needs

Analysis by GBRMPA's Research Reference Group¹ concluded that the priority of information needs is best described in terms of two factors:

- i. the *importance* of the information to the protection and use of the marine park; and
- ii. the *urgency*, or time frame over which the information is required to be effective and lead to outcomes.

Given that 'Importance' and 'Urgency' are relevant in different contexts, they were not combined into any single priority rating.

The prioritisation of information needs reported here was conducted without constraints imposed by factors such as research feasibility or similar factors, to avoid circularity of logic (e.g. to give a problem low priority, because it is not currently considered feasible, would pre-empt the potential for new methods or technologies to be applied). The prioritisation was done at the detailed level of specific Research Questions, rather than for the emergent Themes. This reflects the need for prioritisation at the specific level, and the fact that the Themes were defined to synthesise the *overall* content of the detailed questions, and not their priority. That is, each Theme includes Questions of a wide range of priorities, and those priorities cannot be effectively summarised or 'averaged'.

Importance of Information Need:

In essence, rating the importance of the research need involves answering the question: 'How important is this information to the future protection of the Great Barrier Reef?'

There are three main criteria to answering this question:

¹ Research Reference Group includes representatives of the relevant Critical Issues and other Groups, natural and social science experts from the Research and Monitoring Coordination Unit, and the Director of the Science, Technology and Information Group, Dr David Wachenfeld, who was a co-author of the 2001 listing (Green et al 2001), and Editor of the 1998 State of the Great Barrier Reef World Heritage Area Report.

1. 'Importance to GBR' Risk Analysis: What are the risks to the future of the marine park (or WHA) associated with not obtaining this information?

This risk analysis includes direct and indirect risks, and must consider both the potential consequences, and their likelihood.

As *part* of that criterion:

2. Are there specific policy or legislative imperatives or values to obtaining the information?

(Based on detailed matrix cross-referencing Questions with relevant Acts, National Research Priorities² (sample page at Attachment C); assuming that most or all relevant policy or legislation is directed to protection of the reef, this criterion constitutes a subset of the first);

3. Is the information need of particular concern or interest to the broader community and stakeholders of the reef?

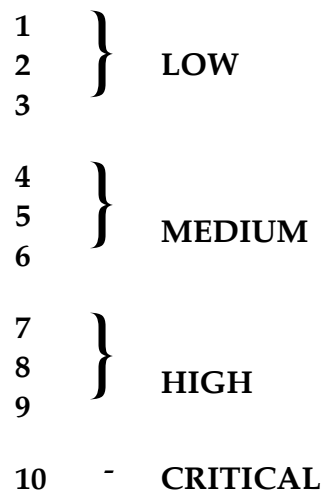
(This reflects the value of engendering stewardship of the reef, in turn facilitated by addressing questions of significance to the community).

The Research Questions were rated for importance using a 'Delphic' process (i.e. consultation and consensus of expert opinion), involving a range of experienced members of both policy and science management sections of the GBRMPA (The Research Reference Group). This assessment drew on priorities allocated by Critical Issues and other Groups within their areas of expertise, and calibrated those priorities to provide an overall, agency/reef-wide perspective. This prioritisation, along with the Questions and Themes themselves, is to be further reviewed through consultation with stakeholders, research providers and Environment portfolio partners.

Each Question was rated as 'Critical', 'High', 'Medium' or 'Low', based on scores between 1-10 (Diagram 2: i.e. ratings will only be presented as the 4 categories, to avoid inappropriate emphasis on small differences, but scoring 1-10 allows more discrimination).

² Virtually all of the information required for management of the GBRMP is relevant to the first National Research Priority: – 'An Environmentally Sustainable Australia', in particular 1.5: 'Sustainable use of Australia's biodiversity' but also including 1.7: 'Responding to climate change and variability'. Some requirements are also relevant to Priority #4.3 – 'Safeguarding Australia: Protecting Australia from invasive diseases and pests'.

Diagram 2:



The scoring process involved:

1. 'Importance to Reef' risk assessment: Initial consensus score of 1-10; then:
2. Legislative or policy relevance: Score increased by 1 (or in extreme cases) 2 'bonus points' if considered to have legislative or policy application or value; and/or
3. Community value: 1 (-2) 'bonus points' if of particular significance to the broader community.

The maximum score was ten; thus, a question may be critical simply in terms of importance to the reef, or because of its combined importance and legislative and/or community significance.

Urgency or Timeframe of Information Need

'Urgency' refers to the time-span over which the information is *needed* in order to contribute to management and protection of the GBRMP; note that some less urgent questions, such as those about long-term trends or processes, may still require urgent data collection as baselines for those long-term trends. Note also that Urgency is used to refer to the information need, and does not necessarily indicate the time a research project might require to address that need.

Each Question was rated, as 0-1 yrs, 1-3 yrs, 3-5 yrs or >5 yrs, by GBRMPA Critical Issues or other Groups with specific expertise in the relevant area. Because the ratings are not relative, they did not need to be compared across the entire list (in contrast to the Importance).

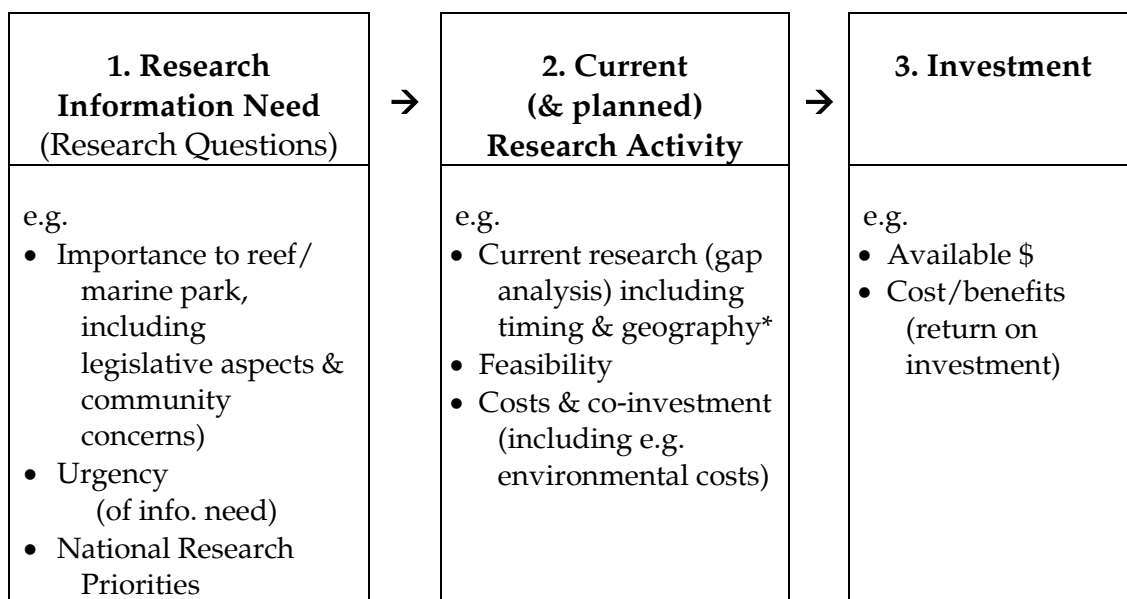
Combination of Research Information Priorities with Research Activities

Prioritisation of overall research investment involves i. the initial prioritisation of the information need, and ii. subsequent integration with information about research activities, costs, feasibility, etc. (Diagram 3).

Detailed information on both research information needs (1) and activities (2) form the basis of a web-accessible 'Research Management System' being developed by the GBRMPA's Research and Monitoring Coordination Unit. This system will integrate the research needs outlined in the main document, with existing and planned research activity, including costs and funding sources, researchers, research locations, etc. (database design shown at Attachment B; also shows relationships with National Research Priorities, legislative instruments, State of the Environment Reporting, Key Performance Indicators, etc.). This will provide a tool for internal and external planning and management of research, such as overall investment prioritisation (either general or circumstance-specific), gap analyses and summarising existing investment.

Development of priorities for overall research investment essentially involves scaling the priority of the need by a wide variety of factors that influence the return on investment or cost/benefit analysis. Cost analysis may be complex, and influenced not only by direct costs, but factors such as the potential for co-investment, or social or environmental costs of the research itself (e.g. research which requires fishing in green zones). Benefit analysis will primarily involve factors that may reduce the benefits (e.g. constraints on feasibility, timeliness, limitations in time or spatial scales of results). That is, practical issues may make a Question a lower priority for investment, but are unlikely to make an unimportant question a high priority.

Diagram 3:



(*e.g. in 5 yr cycle of dugong survey; was the last survey last year or 4 years ago? Is all available information relevant only to part of the marine park?).

Many of these considerations cannot be assessed *a priori* but will be specific to particular funding and other circumstances. For example, costs, co-investment and feasibility may vary considerably among research providers, and investment decisions may involve iterative discussions to develop research plans which maximise return on investment for both providers and users. The implementation of a database-driven Research Management System will facilitate such analyses, by allowing i. compilation of the necessary range of information in a flexible structure; and ii. extensive exploration of cost and benefits, in an efficient and interactive manner, for a wide range of specific circumstances.

Reference

Green, A., Oliver, J., Wachenfeld, D. (2001). Research Priorities for the Management of the Great Barrier Reef Marine Park and World Heritage Area 2001. Research Publication 73, Great Barrier Reef Marine Park Authority, 28pp.