

5 CONCLUSION

The purpose of this paper was to update the financial values presented in Driml (1997b), and also further discuss methods by which resource values for the Marine Park may be estimated on an ongoing basis. The identification of appropriate models was considered an essential first step for the effective evaluation of resource management strategies as the type and format of the data required for estimating resource values depends highly on the evaluation model.

The scope of the study was limited to desk research only, with no primary research incorporated within the scope of works. A draft of the report was presented to, and discussed with, GBRMPA representatives for final comment.

Financial Values

The estimates of the gross financial values of the direct uses of the GBRMP should not be treated as estimates of the values attributable to its status as a protected area. Even in the absence of such a declared heritage area or marine park and the regulatory and infrastructural support provided by GBRMPA, the area would still be used for tourism, commercial and recreational fishing and boating but the financial values generated might be lower due to the greater degradation of the resource. In brief, it cannot be assumed that *all* estimates in terms of tourism, fishing etc. are attributable to the existence of the GBRMP itself or to the activities of GBRMPA in regulating its use.

Our analysis found that the three direct uses of the Great Barrier Reef Marine Park generated average revenues of about \$700 million per annum over the period 1993–94 to 1997–98. We note that the financial year 1995–96 recorded a significantly higher number of tourists than the other years under review, which generated a higher than average level of revenue for the GBRMP.

Table 5.1 Great Barrier Reef Marine Park gross financial value of direct uses (\$'000)*

	1993–94	1994–95	1995–96	1996–97	1997–98
Commercial Tourism	\$411 149	\$436 513	\$507 392	\$430 627	\$454 836
Commercial Fishing	\$141 722	\$120 630	\$149 429	\$141 458	\$136 180
Recreational Fishing and Boating	\$112 038	\$120 194	\$117 953	\$113 258	\$107 572
Total	\$664 910	\$677 337	\$774 774	\$685 342	\$698 588
* = nominal dollars. Source: KPMG Consulting					

In preparing the estimates of financial values, KPMG refined the approach adopted by Driml (1997b), and in this respect, the outcomes of the two studies are not necessarily comparable. We note that the methodology utilised by KPMG is open to further refinement as secondary data sources evolve over time.

It should be noted also that these are estimates of the *gross* value of expenditure and cannot be used to assess the contribution of these activities to income or the Gross Regional Product (GRP). For this purpose, estimates of *value added* generated by each sector would be required.

Input-Output Analysis

The estimates of the financial values of the direct uses of the GBRMP do not include consideration of the flow-on impact, or the effect of linkages of these activities, with other industries in the State economy. We have extended this direct contribution analysis and considered the indirect or flow-on effects of those activities, in terms of output and employment, on the economy of the State of Queensland through the use of input-output analysis. The following table summarises the initial, flow-on and total impacts for output and employment associated with the nominated economic activities that utilise the GBRMP, for the year 1994–95.

Table 5.2 Summary of output effects GBRMP-based activities, Queensland, 1994–95

Activity	Output Effects			Employment Effects		
	Initial Output (\$m)	Flow-on (\$m)	Total Impact (\$m)	Initial Employ. (no.)	Flow-on (no.)	Total Impact
Commercial Tourism	436.5	407.9	844.4	7 421	5 467	12 888
Commercial Fishing	120.6	73.3	193.9	1 568	1 152	2 720
Recreational Fishing and Boating	120.2	134.7	254.9	N/A	2 008	2 008
Total	677.3	615.9	1 293.2	8 989	8 627	17 616
Source: KPMG Consulting						

It is recommended that the economic impact of the activities of GBRMP-based activities is monitored and data collection undertaken cognisant that the initial financial estimates may be utilised to determine flow-on economic impacts. It is recommended that GBRMPA determines the region of significance, that is, the State of Queensland and/or the regional economies, and that data about the activities in the GBRMP be collected for that region of significance. If meaningful comparisons are to be made about the impact of these activities over time, then it is important to establish a consistent approach to data collection.

Economic Decision-making Management Tool

At the outset of this discussion, it must be acknowledged that decision making with respect to natural resource management is complex and commonly involves multiple objectives which are competing and conflicting. As a result, therefore, appropriate tools or techniques to organise data to assist in decision making will necessarily be limited to those which have the capacity to facilitate the incorporation of information from a number of disciplines which can identify an outcome that offers a compromise solution.

Traditional techniques to organise information to evaluate alternative projects or programs to assist decision making, specifically, Cost Benefit Analysis (CBA), require the quantification, in dollar terms, of the full opportunity cost of all of the proposed alternatives to doing nothing. A number of possible problems arise in relation to using CBA as the exclusive or main decision-making tool in natural resource management.

We have suggested that it would be advisable for GBRMPA to consider the use of complementary decision-making models such as Multiple Objective Decision Support Systems (MODSS) or Multiple Criteria Analysis (MCA) which allow the analyst to incorporate both pecuniary and non-pecuniary values in the decision-making process. MCA provides a formal process which is sufficiently flexible to facilitate the incorporation of information from a number of disciplines. It is an appropriate tool to assist decision making when the problem to be addressed is complex and poorly defined; when there are multiple and competing objectives; and, in situations where there are multiple stakeholders with conflicting points of view about the appropriate decision.

Irrespective of which decision-making models GBRMPA decides to use, the issue of the relative weight to be given to the gains and losses of different stakeholder groups, including future generations, has to be addressed explicitly. Where there are conflicting and competing objectives between users of a given natural resource it needs to be made explicit how the gains and losses accruing to different stakeholders are to be compared.

Data Requirements

The following figure provides a schematic representation of alternative data sources and their possible uses in different forms of analysis to support GBRMPA's decision making. We distinguish between 'routine' and 'non-routine' data sources.

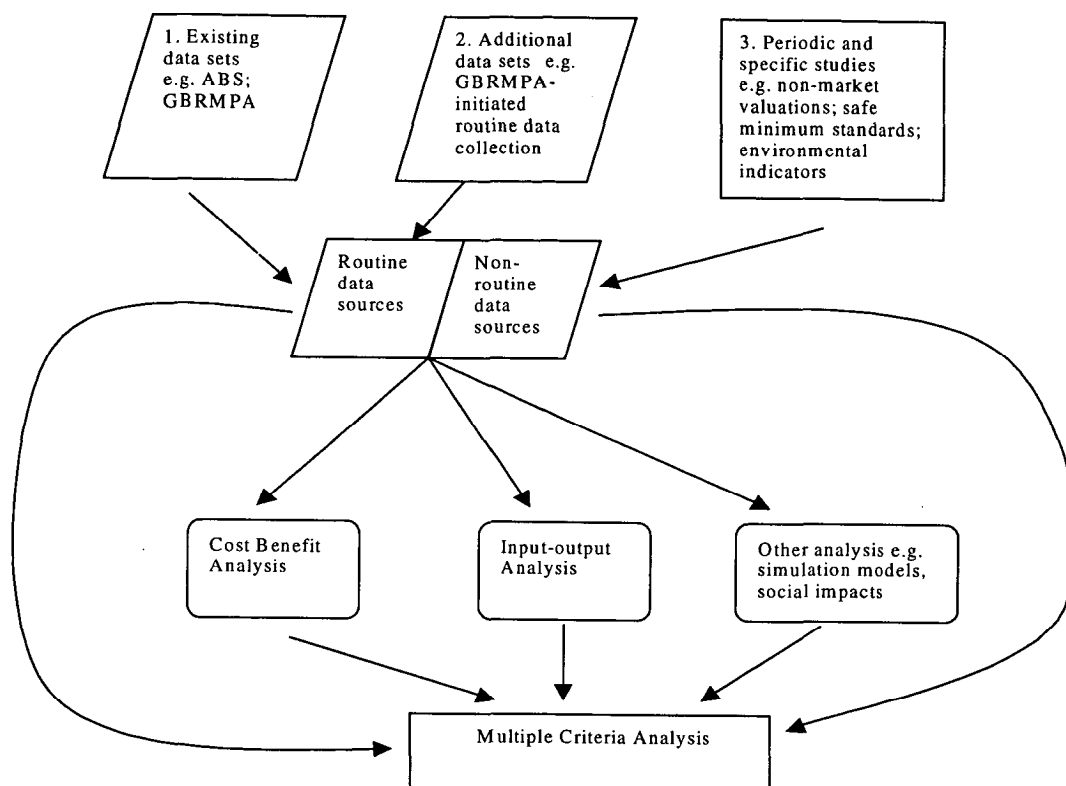


Figure 5.1 Schematic representation of data requirements and uses

It is recommended that GBRMPA:

- Undertake a number of survey-based studies to derive realistic and defensible estimates of trade-off values between alternative GBRMP uses. The number and spatial range of such studies required will depend upon the extent to which *benefit transfer* is considered a reliable methodology for estimating values of identical or similar attributes in a context or location other than that in which a survey-based estimate has been derived.
- Establish a set of appropriate sustainability indicators, covering economic, social, and environmental characteristics, that are sensitive to changes in resource use in the Park. The indicators should be selected to ensure that changes in these characteristics are monitored on a consistent basis over time and across the whole area of the GBRMP. These indicators should also provide an appropriate basis for setting safe minimum standards (SMS) for future uses of the GBRMP.
- Establish long-term monitoring studies in order to gain further information about biological thresholds, while tourists, as consumers, need to be studied in terms of their reaction to overcrowding and their willingness to pay for significant attributes of the natural resource.
- Undertake a survey of stakeholders to solicit preferences for resource management, and, more importantly, to identify the criteria or objectives for management and to establish the relative importance of identified objectives. It is not envisaged that such a survey would be required on a regular basis but if it were undertaken periodically, say every three to five years, stakeholder involvement in decision-making processes, particularly if an MCA approach is adopted, would be considerably improved.

It needs to be emphasised that the compilation of an economic data set for use in decision making requires the same long-term investment in appropriate research as is the case for scientific data. To this end GBRMPA needs to give serious consideration to both ad hoc data collection exercises, possibly on a consultancy arrangement as is the existing practice, and to long-term research projects in collaboration with appropriate research institutions, for instance, under ARC SPIRT* grants with Universities.

* Australian Research Council *Strategic Partnerships with Industry – Research and Training Scheme*