



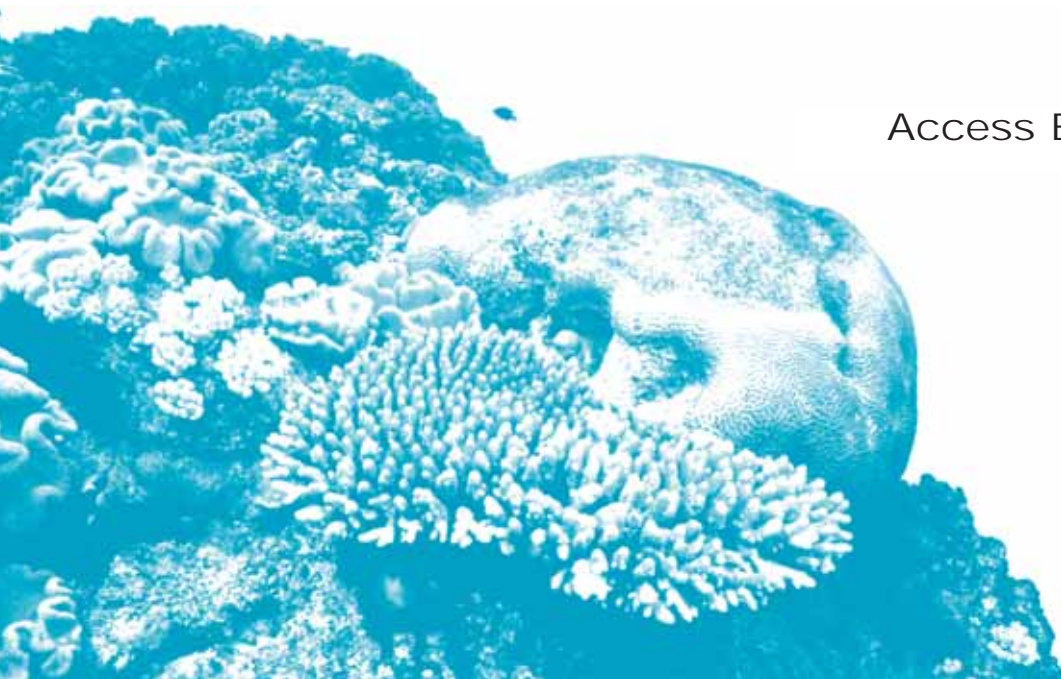
**Australian Government**

**Great Barrier Reef  
Marine Park Authority**

RESEARCH PUBLICATION NO. 98

# Economic Contribution of the Great Barrier Reef Marine Park, 2006-07

Access Economics Pty Ltd



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# TABLE OF CONTENTS

<b>GLOSSARY .....</b>	<b>i</b>
<b>EXECUTIVE SUMMARY.....</b>	<b>ii</b>
<b>1. Introduction .....</b>	<b>1</b>
1.1 The analysis in context .....	1
<b>2. The Great Barrier Reef Marine Park and Catchment Area .....</b>	<b>3</b>
2.1 Defining the Great Barrier Reef Catchment Area .....	5
2.2 The Importance of the Catchment Area.....	7
<b>3. Framework of the analysis .....</b>	<b>8</b>
3.1 Defining economic contribution.....	9
3.2 Overview of the methodology .....	10
3.3 Collection and processing of data.....	11
3.4 Mapping to IO sectors .....	12
3.5 IO modelling of direct and indirect contributions .....	12
3.6 Limitations of the analysis .....	14
<b>4. Economic contributions from tourism in the GBRCA .....</b>	<b>15</b>
4.1 Tourism expenditure .....	16
4.2 Economic contribution of tourism.....	17
<b>5. Economic contributions from commercial fishing in the GBRMP .....</b>	<b>22</b>
<b>6. Economic contributions from recreational use of the GBRMP .....</b>	<b>25</b>
6.1 Expenditures on recreational use .....	25
6.2 Economic contributions of recreational use .....	26
<b>7. Conclusions, caveats &amp; further work needed .....</b>	<b>29</b>
7.1 Comparison with other industries within the GBRCA .....	30
7.2 Comparisons with the Access Economics report for 2004-05 and 2005-06.....	32
7.3 Qualifications to results .....	36
7.4 Caveats .....	36
7.5 Future Work implications .....	36
<b>REFERENCES.....</b>	<b>38</b>
<b>Attachment A: Methodology .....</b>	<b>40</b>
<b>Attachment B: Data sources.....</b>	<b>58</b>
<b>Attachment C: Inter-regional, interstate and international trade .....</b>	<b>61</b>
<b>Attachment D: Summary of report comparison .....</b>	<b>66</b>

## FIGURES

Figure 2.1: Great Barrier Reef New Zoning Plan, 1 July 2004	4
Figure 2.2: Great Barrier Reef Catchment Area and Included LGAs	6
Figure 3.1: Accounting for inputs, output and value added	10
Figure 3.2: Flow chart for the methodology used to estimate economic contribution	10
Figure 4.1: Number of visits per year, by GBRMPA management region	15
Figure 4.2: TSA-consistent tourism expenditure in the GBRCA, by place of residence and type of visitor, 2006-07 (\$million)	17
Figure 6.1: Recreational vessel registrations for GBR coastal communities	25
Figure A.1: Flow chart for the methodology used to estimate economic contributions	41

## TABLES

Table 1.1: Direct/indirect value added contributions of selected activities to the GBRCA, Queensland and Australia in 2006-07 (\$million)	iii
Table 1.2: Direct plus indirect value added contributions of selected activities to the GBRCA, Queensland and Australia in 2004-05, 2005-06, 2006-07 (\$million)	iv
Table 2.1: Summary of Allowed Activities in GBRMP Zones	5
Table 3.1: Expenditure categories by activity and IO sector	13
Table 4.1: tourist expenditure in GBRCA tourism regions, 2006-07 (\$million)	16
Table 4.2: Economic contributions of tourism to the GBRCA, Queensland and Australia, 2006-07	19
Table 4.3: Economic contributions of tourism to the GBRCA, by IO industry, 2006-07	20
Table 5.1: Commercial fishing in the GBRMP, gross value of production, components, 2004-05 to 2006-07, \$ million	22
Table 5.2: Economic contributions to the GBRCA, Queensland and Australia of commercial fishing in the GBRMP, 2006-07	23
Table 5.3: Economic contributions to the GBRCA of commercial fishing in the GBRMP, by IO industry, 2006-07	24
Table 6.1: Estimated expenditure on recreational use of the GBRMP, components, 2004-05 to 2006-07, \$million	26
Table 6.2: Economic contributions to the GBRMP, Queensland and Australia of recreational use of the GBRMP by GBRCA residents, 2006-07	27
Table 6.3: Economic contributions to the GBRCA of recreational use of the GBRMP by GBRCA residents, by IO industry, 2006-07	28
Table 7.1: Direct plus indirect value added contributions of selected GBRCA activities to the GBRCA, Queensland and Australia, 2006-07, \$million	29
Table 7.2: Ratio of indirect to direct value added contributions, by activity and region, 2006-07	30

Table 7.3: Direct value added and employment by industry, GBRCA, 2006-07	31
Table 7.4: Comparison of direct/indirect economic contribution of GBRMP/GBRCA activities to the GBRCA, Queensland and Australia across reports, 2004-05, 2005-06 and 2006-07	33
Table 7.5: Expenditures on selected GBRCA/GBRMP activities, 2004-05 to 2006-07, \$million (current values)	34
Table 7.6: Comparison of direct/indirect value added contributions of GBRMP/GBRCA activities to the GBRCA, Queensland and Australia, 2004-05, 2005-06 and 2006-07	35

## GLOSSARY

DPI&F	Queensland Department of Primary Industries & Fisheries
EMC	Environmental Management Charge
FTEs	Full Time Equivalents
GBRCA	Great Barrier Reef Marine Park Catchment Area
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GAP	Gross Area Product
GDP	Gross Domestic Product
GSP	Gross State Product
GVP	Gross Value of Production
IVS	International Visitor Survey
LDT	Long Distance Transport
LGA	Local Government Area
NVS	National Visitor Survey
REM	Regional Expenditure Model
TEV	Total Economic Value
TRA	Tourism Research Australia
TSA	Tourism Satellite Accounts

## **EXECUTIVE SUMMARY**

The Great Barrier Reef Marine Park Authority (GBRMPA) commissioned Access Economics to estimate the economic and financial value of activity undertaken within the Great Barrier Reef Marine Park (GBRMP) for the financial year 2006-07.

The GBRMP ranges from the tip of Cape York, down the coast almost to Bundaberg. The GBRCA is defined geographically as the set of local government areas with rivers that flow into the GBRMP.

The results are presented in a manner that considers the GBRMP and its contribution to the Great Barrier Reef Catchment Area (GBRCA). In this analysis, activities that are associated with the GBRMP are attributed to the economic activity of the GBRCA.

The activities considered include tourism, commercial fishing and recreational activity.

This report is the third assessment of the economic and financial value of the GBRMP produced by Access Economics.

The methodology used for tourism and recreational use follows that used by the ABS in its Tourism Satellite Accounts (TSA). The report is restricted to financial transactions recorded in national accounts, and makes no attempt to take account of social or environmental values.

The economic contribution of the GBRMP calculated in the report considers economic activity and employment. The standard measure of economic activity used is value added. Value added (output after deducting the value of inputs) is the most appropriate measure of an industry's/company's economic contribution.

The direct contribution is a measure of the economic activity (value added) directly associated with tourism, commercial fishing, and recreational uses. The indirect value added of an activity is the sum of value added associated with the inputs of goods and services into that activity. For example, the sales revenue of a hotel includes the value added of key inputs such as electricity and cleaning services.

## **MAJOR FINDINGS**

A summary of the direct and indirect contributions of the various activities considered in the report is presented in Table 1.1. The total direct and indirect contribution of the GBRMP to the GBRCA is estimated to be just under \$3.6 billion in 2006-07. The figure is larger for Queensland at just around \$4.0 billion. Australia-wide, the contribution is just over \$5.4 billion. These figures correspond with estimated employment contributions, direct and indirect, of 39,700 full time equivalents (FTE) of the GBRMP to the GBRCA. The employment figures for Queensland and Australia are 43,700 and 53,800 respectively.

Tourism is by far the largest contributor to economic activity, accounting for 94% of the direct and indirect contribution. Of the remaining activities, fishing, both commercial and recreational, accounts for the bulk of the remaining contribution.

The indirect contributions are relatively strong, accounting for between 28% of the total direct and indirect contribution of the GBRMP to the GBRCA, up to 43% of the contribution of the GBRMP to Australia. This is because of the linkages that, mainly tourism, have to the domestic economy through the purchases of various input goods and services.

**TABLE 1.1: DIRECT/INDIRECT VALUE ADDED CONTRIBUTIONS OF SELECTED ACTIVITIES TO THE GBRCA, QUEENSLAND AND AUSTRALIA IN 2006-07 (\$MILLION)**

<b>Activity</b>	<b>GBRCA</b>	<b>Queensland</b>	<b>Australia</b>
<b><i>Direct contribution</i></b>			
Tourism	2,257	2,314	2,682
Commercial fishing	89	89	87
Recreational fishing	39	39	46
Other recreational activity	23	23	26
<b>Total direct contribution</b>	<b>2,408</b>	<b>2,465</b>	<b>2,841</b>
<b><i>Indirect contribution</i></b>			
Tourism	1,087	1,408	2,435
Commercial fishing	28	34	52
Recreational fishing	22	28	51
Other recreational activity	13	17	30
<b>Total indirect contribution</b>	<b>1,150</b>	<b>1,487</b>	<b>2,567</b>
<b><i>Direct plus indirect contribution</i></b>			
Tourism	3,344	3,722	5,117
Commercial fishing	117	124	139
Recreational fishing	61	66	96
Other recreational activity	36	39	57
<b>Total contribution</b>	<b>3,558</b>	<b>3,951</b>	<b>5,409</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

The major qualification to current results is that tourism data are for the GBRCA rather than for the GBRMP. Many visitors to the region do not visit the GBRMP while many others spend only some of their time in the GBRMP. If tourism contributions of the GBRMP could be isolated, the tourism results would be much smaller. The results of this work could be enhanced through the availability of more accurate data on what proportion of this expenditure can be attributed to the GBRMP itself.

## COMPARISON WITH PREVIOUS REPORTS

Access Economics has now calculated economic contributions for the three financial years to 2006-07. Over that period of time, the contribution of the GBRMP to the GBRCA, Queensland and Australia has increased.

Differences between results are to be expected because of changes in underlying data across years, such as the growth of tourism over the period, but there have also been some refinements in the methodology. For the sake of comparison over time, a reconciled forecast that, to the nearest approximation, removes methodological changes is presented in Table 1.2.

The results show an overall increase in the estimated contribution of GBRMP to the GBRCA, Queensland and Australian economies over the three years as a result of mainly an increased contribution of tourism and recreational use. The contribution of commercial fishing is relatively unchanged over the period.

**TABLE 1.2: DIRECT PLUS INDIRECT VALUE ADDED CONTRIBUTIONS OF SELECTED ACTIVITIES TO THE GBRCA, QUEENSLAND AND AUSTRALIA IN 2004-05, 2005-06, 2006-07 (\$MILLION)**

<b>Activity (value added)</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>
<b>GBRCA</b>			
Tourism	2,790	3,113	3,344
Commercial fishing	114	110	117
Recreational use	85	91	97
<b>Total contribution</b>	<b>2,989</b>	<b>3,314</b>	<b>3,558</b>
<b>Queensland</b>			
Tourism	3,110	3,466	3,722
Commercial fishing	121	116	124
Recreational use	93	99	106
<b>Total contribution</b>	<b>3,323</b>	<b>3,682</b>	<b>3,951</b>
<b>Australia</b>			
Tourism	4,275	4,764	5,117
Commercial fishing	135	130	139
Recreational use	134	143	153
<b>Total contribution</b>	<b>4,544</b>	<b>5,038</b>	<b>5,409</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

Note: The results are based on the same methodology and industry definition applied in 2006-07 report.

The estimates shown in Table 1.2 for 2004-05 and 2005-06 differ to those published in previous reports. This is due to the refinements in the methodology over time as well as data updates. For example, the estimated direct and indirect contribution of the GBRMP to the GBRCA in 2005-06 was just under \$3.5 billion, which is a little below the current 2006-07 estimate. From previously published estimates, it is more appropriate to consider the growth in total contributions estimated. In other words, the estimated growth in the total contribution of the GBRMP to the GBRCA from 2005-06 to 2006-07 is 7.3% according to the figures shown in Table 1.2. Using this previous estimate as a base, and applying this new growth rate, implies an estimated total contribution of the GBRMP to the GBRCA of \$3.8 billion.

## IMPROVING THE ANALYSIS

The best way to enhance the accuracy of future reports is to establish, using firm data, which proportions of expenditures on visits to the GBRCA can be attributed to the GBRMP. In addition, there are other activities that could be included in the analysis such as:

- ☐ GBRMPA management and DPI&F Fisheries monitoring of the GBRMP;
- ☐ Scientific research, which overlaps to some extent with Park management. A comprehensive summation of the annual gross costs involved, based on the Hand report (GBRMPA 2003), might be between \$100 and \$200 million per annum; and
- ☐ Processing of the commercial fishing catch.

Any information in these areas would help to make the analysis in this report more comprehensive. Any or all of these improvements could be addressed as soon as data are available.

# 1. INTRODUCTION

This report has been prepared by Access Economics and commissioned by the Great Barrier Reef Marine Park Authority (GBRMPA). It presents quantitative estimates of the economic and financial value of selected types of activity undertaken within the Great Barrier Reef Marine Park (GBRMP) and Great Barrier Reef Marine Park Catchment Area (GBRCA) for the financial year 2006-07. Access Economics has previously completed reports for the GBRMPA for the 2004-05 and 2005-06 financial years, and this report builds upon these (Access Economics 2005, 2007).

The report focuses on the contributions of tourism, commercial fishing and recreational activities, including recreational fishing, and is structured as follows:

- ❑ Section 2 defines the geographic scope of the analysis and sets out the reasons for focussing on the GBRCA for the contribution of tourism.
- ❑ Section 3 describes the methodology and data sources and estimation methods.
- ❑ Section 4 discusses and presents estimates of the economic contributions of tourism to the GBRCA.
- ❑ Section 5 discusses and presents estimates of the economic contributions of commercial fishing within the GBRMP.
- ❑ Section 6 discusses and presents estimates of the economic contributions of recreational use of the GBRMP by local residents.
- ❑ Section 7 presents Access Economics' conclusions, comparisons with the earlier Access Economics studies, and outlines areas for further improvement.

Additional explanatory material is presented in Attachment A (Methodology) and Attachment B (Data sources). Attachment C describes the contributions to regional, interstate and international trade of these activities.

## 1.1 THE ANALYSIS IN CONTEXT

This report provides an economic contribution study, not an economic impact study:

- ❑ The former is an economic accounting exercise, relating to a specific period (in this case 2006-07), that seeks to capture all of the market-related activity flows for the specified industries or activities. It tells a story about the value of that activity at that time, but does not explain why or how that activity came about.
- ❑ The latter is properly tackled as a general equilibrium modelling exercise, where a specified *change* (or 'shock') to the status quo is quantified and run through the model to explore how the model solution changes. If the model is properly structured, this exercise quantifies the impact of the specified shock on the rest of the model of the economy under consideration.

The direct and indirect impacts of tourism (and other industries) are often characterised as multipliers, expressed in statements such as: 'Every 100 visitors generate one job'. The Tourism Satellite Account (TSA) approach adopted by this report is different, however, because it forces the analysis to concentrate on *what travellers spend*, and the contribution of this expenditure to value added.

But even using the TSA approach, these so-called 'multipliers' must be treated carefully. While expressing the data in this manner may be seen as a convenient rule of thumb, Access Economics cautions against overuse of these 'multipliers'. This is because tourism and other businesses often have significant scale economies. Airports, airlines, hotels, restaurants and many other tourism businesses could increase output by 10% (that is, serve 10% more tourists) by increasing inputs (such as labour) by, say, only 4%. If they also have spare capacity, they can boost activity without adding to the staff employed, at least to some extent.

Some may argue this is bad news, as it means the employment multiplier is less than expected, however Access Economics believes that this is not a sensible way of looking at the issue. Instead, this example suggests that increasing traveller demand *will* increase jobs, albeit perhaps by less than the average 'multiplier' implied, *but it will increase the economic payoffs to the region even more as these scale economies are captured.*

Spending on travel is in significant part a substitute for spending on other items. For example, if there was a short-term downturn in travel, it may well be offset by increases in other types of spending. To be more specific, suppose a few Cairns residents had planned to travel to Mossman for lunch, but it was raining, so they went to a local restaurant instead. Lunch was still eaten and money was still spent, but Mossman would have counted as tourist expenditure, whereas the local restaurant is not counted, because it is a local (non-tourist) meal. In this example, the reduction in tourist expenditure is offset by an increase in non-tourist expenditure, so a simple multiplier would overstate the effect on the GBRCA.

Hence the caveat: over reliance on, or careless interpretation of, multipliers can lead to inaccuracies.

## **2. THE GREAT BARRIER REEF MARINE PARK AND CATCHMENT AREA**

The Great Barrier Reef Marine Park (GBRMP) ranges from the tip of Cape York in Queensland in the north extending south past the Tropic of Capricorn to just north of Bundaberg. It covers an area of approximately 345,400 square kilometres and stretches more than 2,300 kilometres along the northeast coast of Queensland. Its width varies from around 90 kilometres to around 300 kilometres (see Figure 2.1).

The Park extends eastwards from the Queensland shoreline and its outer boundaries are defined by coordinates of latitude and longitude. It includes reef and wrecks within these boundaries. However, it excludes islands within its boundaries and some harbour areas around ports.

A revised Zoning Plan for the Park came into effect on 1 July 2004, establishing new types of zones and corresponding boundaries. The revised zones and classification of allowable activities has greatly improved protection of the biodiversity within the Park, while preserving public access.

The major outcome of these changes was an increase in the proportion of the GBRMP classified as 'no-take areas', from around 4.5% to 33.3% of the Park. Anyone can enter a no-take area, and boating, swimming, sailing and snorkelling are allowed, however extractive activities like fishing or collecting are not allowed unless written permission has been obtained from the Authority.

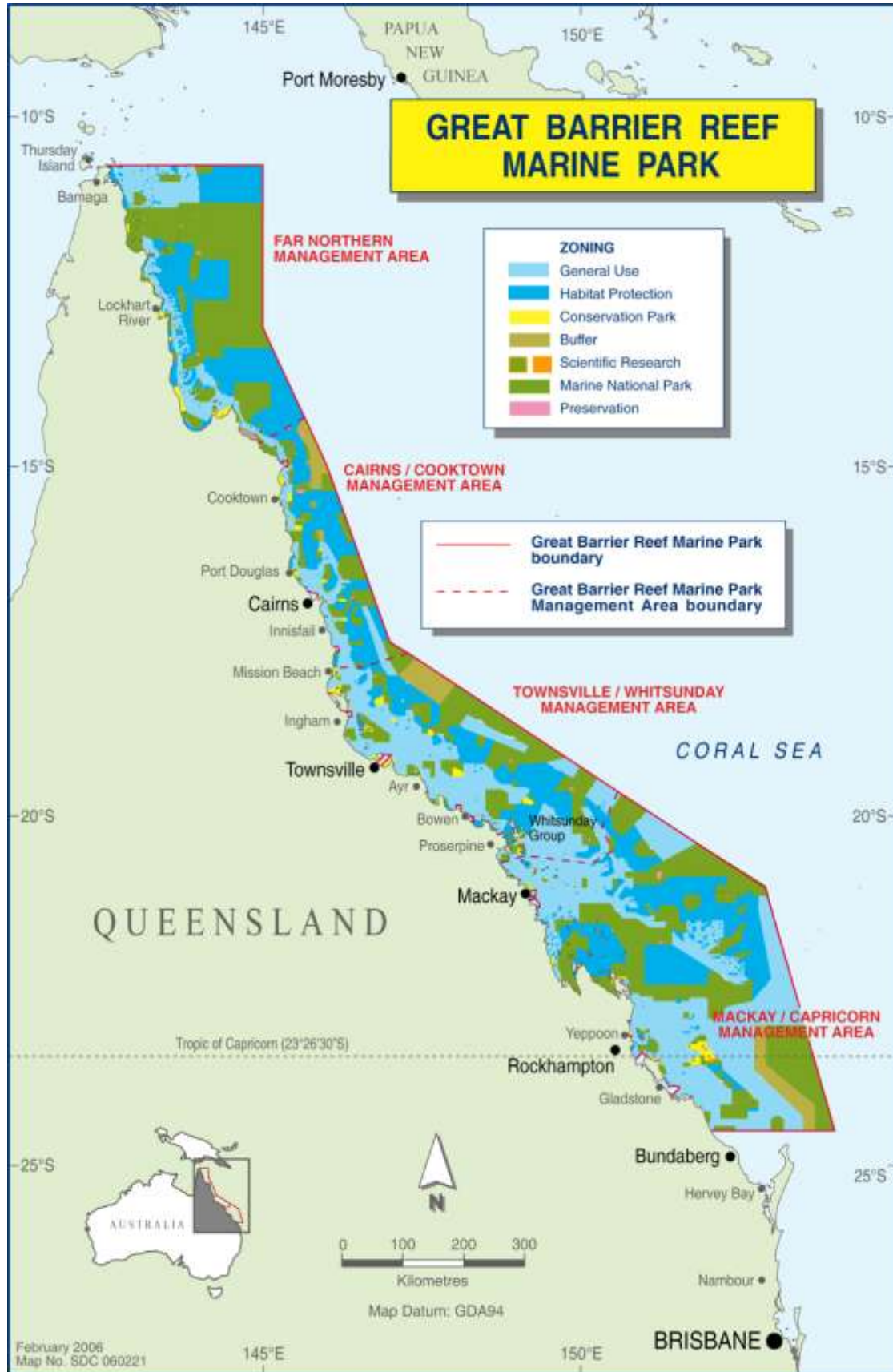
There are now seven types of Commonwealth-specified zones within the Park, and an eighth State-specified estuarine conservation zone. Figure 2.2 presents a broad picture of the activities that are allowed in each of the Commonwealth-specified zones.

Individuals are allowed access to most of the Park for boating, diving and photography however there are varying restrictions on what may be caught or collected, based upon the zoning. Commercial operations require permits, and are also prohibited from undertaking extractive activities in some zones.

GBRMPA receives limited income from the issue of permits to commercial tourism operators. An Environmental Management Charge (EMC) of \$5.00 per person per day is collected via tourism operators. Revenue generated by the EMC in 2006-07 was \$7.25 million.

GBRMPA receives no income from commercial fishing licences, except for a small amount from permits for dive-based (harvest) fisheries. Commercial fishing licence fees are paid to the Queensland Fisheries Service and boat registration fees are paid to Queensland Transport Services while shipping charges, including pilot fees, are paid to port authorities. Permits are required for freight ships to move through the Park but GBRMPA receives no corresponding income. There are considerable risks from potential oil spills, but the costs of recovery from damage are seen as an insurance matter.

**FIGURE 2.1: GREAT BARRIER REEF NEW ZONING PLAN, 1 JULY 2004**



Source: GBRMPA.

**TABLE 2.1: SUMMARY OF ALLOWED ACTIVITIES IN GBRMP ZONES**

<i>Activity</i>	<i>General Use Zone</i>	<i>Habitat Protection Zone</i>	<i>Conservation Park Zone</i>	<i>Buffer Zone</i>	<i>Scientific Research Zone</i>	<i>Marine National Park Zone</i>	<i>Preservation Zone</i>
						no take	no go
Trawling	yes						
Netting (other than bait netting)	yes	yes					
Bait netting, crabbing	yes	yes	yes				
Limited spearfishing (snorkel only), line fishing	yes	yes	yes				
Limited collecting	yes	yes	yes				
Trolling	yes	yes	yes	yes			
Boating, diving, photography	yes	yes	yes	yes	yes	yes	
Traditional uses of marine resources	yes	yes	yes	yes	yes	yes	
Limited impact research	yes	yes	yes	yes	yes	yes	permit
Dive-based fishing (sea cucumber, trochus, tropical rock lobster)	permit	permit					
Aquaculture, dive-based fishing (aquarium fish, coral, beachworm)	permit	permit	permit				
Shipping (other than in designated shipping area)	yes	permit	permit	permit	permit	permit	
Tourism program	permit	permit	permit	permit	permit	permit	
Research (other than limited impact)	permit	permit	permit	permit	permit	permit	permit

Source: GBRMPA.

## 2.1 DEFINING THE GREAT BARRIER REEF CATCHMENT AREA

The boundary of the Great Barrier Reef Catchment Area (GBRCA) is shown in Figure 2.2 below (OESR, 2005). It is the catchment area for waters that flow from Australia into the GBRMP, and is defined geographically as the set of Local Government Areas (LGAs) from which bodies of water flow into the GBRMP.

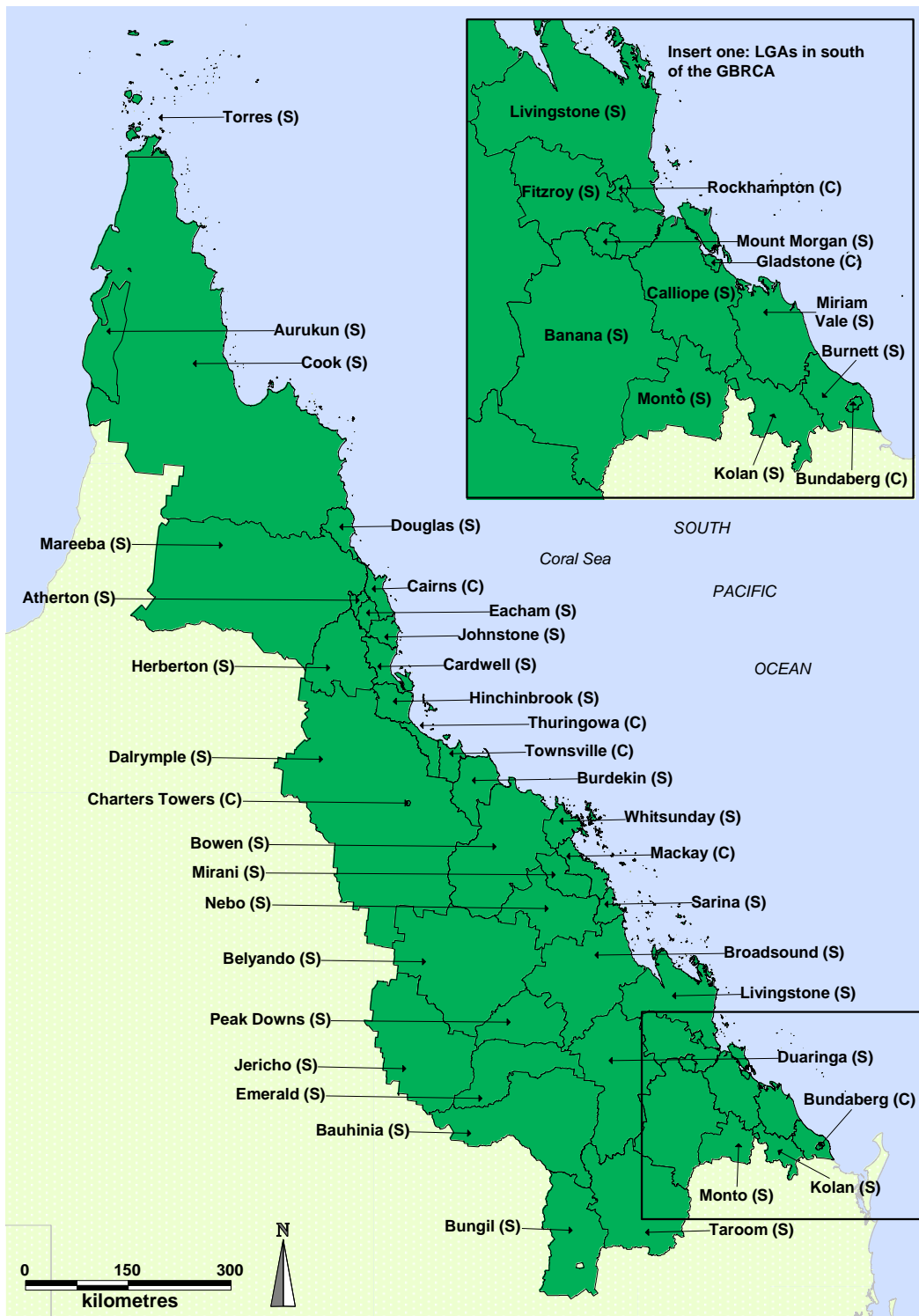
The western boundary more or less follows the Great Dividing Range peaks. At the northern end, the Catchment Area extends further west to the Gulf of Carpentaria because the relevant LGAs cover the width of the Cape York Peninsula, and the southern boundary of the Catchment Area extends from north of Roma to the coast south of Bundaberg.

The Catchment Area extends about 100 kilometres further south along the coast than the Marine Park, as water from the Bundaberg River is carried north into the Park by currents. The southern boundary of the Catchment Area excludes some parts of rivers that flow into the Bundaberg River. Major cities and towns within the Catchment Area are Cairns, Townsville, Charters Towers, Bowen, Mackay, Rockhampton, Gladstone and Bundaberg.

The GBRCA corresponds approximately to the ABS Statistical Divisions (SDs) of Far North, Northern, Mackay and Fitzroy. The latter three SDs are wholly contained within the Catchment Area, while around 85% of the Far North SD is within the Catchment Area; the remaining 15% is sparsely populated. The Catchment Area also includes around 30% of the Wide Bay-Burnett SD and the northern 20% of the Darling Downs SD.

For the purposes of our analysis, we have approximated the GBRCA as consisting of the Statistical Divisions of Far North, Northern, Mackay and Fitzroy, plus a proportion of the Wide Bay-Burnett SD. This proportion has been equated to the share of the Wide Bay-Burnett population living within the catchment area, approximately 29%.

**FIGURE 2.2: GREAT BARRIER REEF CATCHMENT AREA AND INCLUDED LGAS**



Source: OESR (2005).

## 2.2 THE IMPORTANCE OF THE CATCHMENT AREA

Statistics relevant to this study are not available for the GBRMP in isolation. The GBRCA, however, aligns with relevant ABS statistics and so provides a suitable geographical basis for the calculations presented in this report. It is the land-based area that adjoins the GBRMP and supplies goods and services directly and indirectly to the GBRMP for users of and visitors to the Park. It should be noted that the GBRCA is a much larger region than the GBRMP, as it includes large areas of mainland Australia, and it does not exclude the islands within the Marine Park as the definition of the GBRMP does.

Most residents in the GBRCA live relatively close to the GBRMP and so can readily use it for recreational purposes however travel distances from some western parts of the Catchment Area to the Marine Park are up to 400 kilometres. The Bureau of Tourism Research (BTR), in its *Assessment of tourism activity in the GBR Marine Park Region* (2003), used a stricter definition of accessibility for recreational purposes that excluded some of these western parts. Limitations in the availability of data on tourism have prevented the use of a similarly strict definition in this report, as the available data for the GBRMP are not suitable for a proper national accounts-based analysis.

Adequate, if not ideal, tourism data are available for the GBRCA. There are several implications of using the GBRCA rather than the GBRMP for tourism, including the following:

- ❑ The economic contribution of tourism is over-stated in absolute terms as some tourists visiting the GBRCA do not visit the Marine Park.
- ❑ The same comment does not apply to recreational activity or commercial fishing, provided that the inclusion of adjoining coastal waters in reporting results for the GBRMP is accepted. In any case, the over-statements arising from these inclusions are likely to be small.
- ❑ The report's conclusions about the economic contributions of these three groups of activity will tend to over-state the importance of tourism relative to commercial fishing and recreational activity.
- ❑ Because of data limitations, quantifying the magnitude of this over-statement is not possible.

### 3. FRAMEWORK OF THE ANALYSIS

There have been several attempts, on varying bases, to measure the economic, financial and social value of the GBRMP.<sup>1</sup> The Hand Report considers the Total Economic Value (TEV) concept which covers:

- ☐ 'Use' and 'non-use' values, many of which require difficult and/or controversial imputation assumptions to produce quantitative estimates of value.
- ☐ Within the former, direct and indirect values, also broken down into extractive and non-extractive uses and goods and services.
- ☐ Some of these may or may not line up well with standard stocks and flows concepts, and in many cases, valuations are both difficult and subjective.

An illustrative list of the elements included within the TEV framework clarifies this point. These elements include (see the Hand report for full definitions):<sup>2</sup>

- ☐ Existence values;
- ☐ Bequest values;
- ☐ Option values;
- ☐ Quasi-option values; and
- ☐ Religious and/or spiritual (including indigenous community) values.

These sometimes entail combining a variety of methodologies and value imputations covering activities and perceived values that are not readily amenable to objective, or market price-based, quantification.

Where these generate quantitative estimates that are then added together to generate a 'total' estimate which, in some cases, is compared with Australia's GDP or Queensland's Gross State Product (GSP), a major risk arises that 'apples and oranges' are being compared.

This report is much less ambitious:

- ☐ It looks only at national accounts-based *flows* for which market transactions can readily be estimated or imputed and for which associated input-output (IO) tables can be compiled.
- ☐ It concentrates on value added, gross product and employment.
- ☐ It does not look at *stocks* because of the fledgling state of the art in relation to environmental accounting using national accounts frameworks.
- ☐ This report concentrates on only three industries: tourism, commercial fishing and recreational activity, where the first and third include estimates for recreational fishing.

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<sup>1</sup> See, for example, *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, Tony Hand, PDP Australia Pty Ltd, November 2003. Hereafter this is referred to as the Hand Report.

<sup>2</sup> See Hand, op. cit., section 4.

Even within a national accounts framework, the focus on these three industries means that about 70%<sup>3</sup> of the gross value of production in the region within which the GBRMP lies is excluded.

Mineral production (about 50% of the total) and agricultural production (another 20% or so) are not discussed in this report, in spite of their relative importance to the Marine Park.

Additionally, there are a number of treasured values relating to the GBRMP and its surrounds that are not easily, or at all, incorporated within a quantitative national accounting framework, whatever their intrinsic importance, whether we are looking at flows and/or stocks. From a complementary perspective, these values cover, amongst other things:<sup>4</sup>

- ☐ Indigenous cultural values;
- ☐ National heritage values;
- ☐ Environmental and scarcity values; and
- ☐ Other indirect environmental values.

Some of these are effectively embodied in market transactions, but many are not.

This is not to say that such values are either unimportant or not worth attempting to quantify, quite the contrary. But they cover dimensions not easily incorporated into the current national accounting framework.

### **3.1 DEFINING ECONOMIC CONTRIBUTION**

'Economic contribution' studies are intended to quantify measures such as gross product, value added, exports, imports and employment associated with a given activity, industry or firm, in a historical reference year.

Value added (output after deducting the value of inputs) is the most appropriate measure of an industry's/company's economic contribution. The value added of each industry in the value chain can be added without the risk of double counting. It can be calculated directly by summing the returns to the primary factors of production, labour and capital (the gross operating surplus, 'GOS', or profit), as well as production taxes less subsidies (see Figure 3.1).

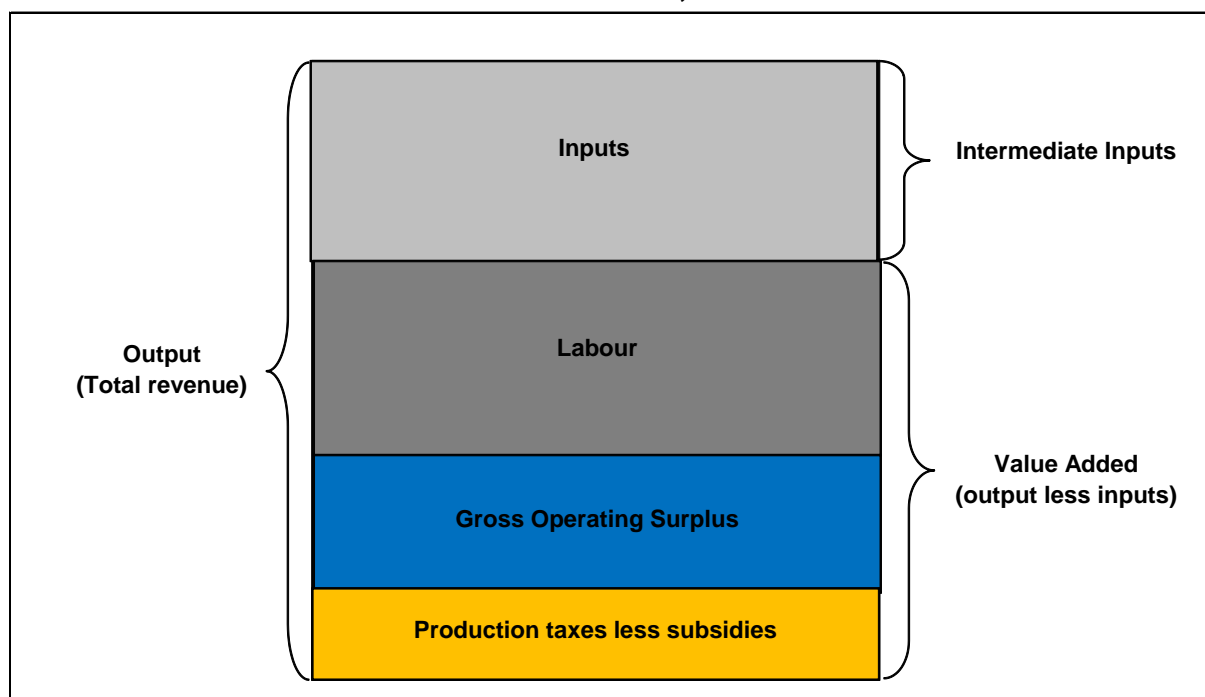
Measures such as total revenue or total exports double count — that is, overstate the contribution of an industry/company to economic activity — as they include the value added of other industries. For example, the sales revenue of a hotel includes the value added of key inputs such as electricity and cleaning services. While describing the geographic origin of such inputs may be a guide to a firm's linkages with the local economy, it should be recognised that these are the type of normal industry linkages that characterise all economic activities.

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<sup>3</sup> Based on estimates presented in *Land Use and Water Quality in the Great Barrier Reef Catchment* Productivity Commission, Research Report, 2003.

<sup>4</sup> Hand, op. cit., pages 8-14.

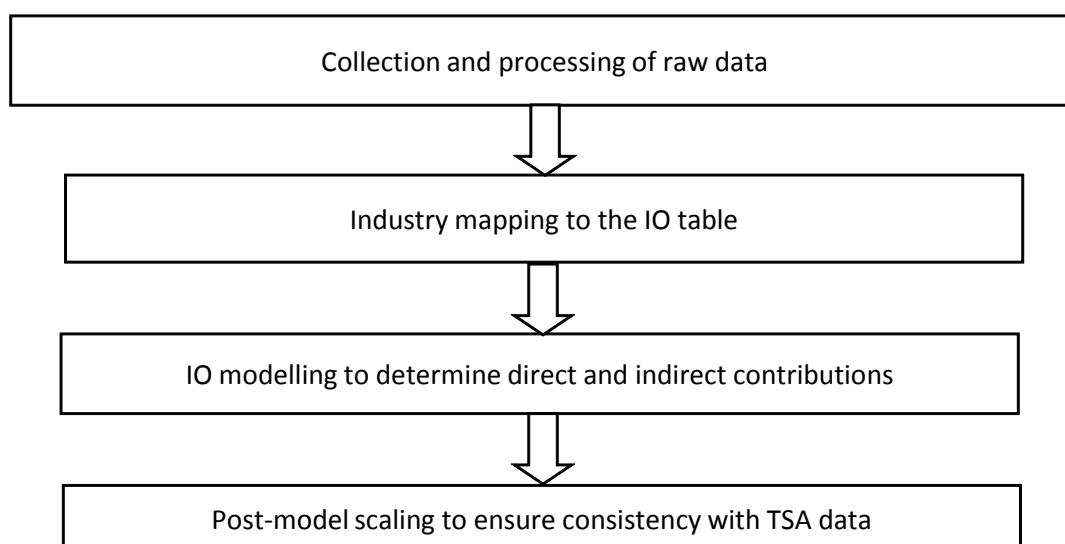
**FIGURE 3.1: ACCOUNTING FOR INPUTS, OUTPUT AND VALUE ADDED**



## 3.2 OVERVIEW OF THE METHODOLOGY

Figure 3.2 is a flow chart that summarises the three stages of the methodology. At a broad level, the methodology is based on collecting detailed, activity based data to determine expenditure shares, and ensuring these are consistent with national accounts when applied to a simple IO model framework. An overview of the methodology is presented below, with a more detailed description presented in Attachment A.

**FIGURE 3.2: FLOW CHART FOR THE METHODOLOGY USED TO ESTIMATE ECONOMIC CONTRIBUTION**



### **3.3 COLLECTION AND PROCESSING OF DATA**

The first stage of the process is to collect and process expenditure data for the four activities considered: tourism; commercial fishing; recreational fishing and other recreational activities. The economic analysis in this report relies heavily on the TSA methodology. This methodology is based on collecting, which is applied to tourism and recreational use of the Marine Park.

The calculations were for 2006-07. Where data for 2006-07 were not available, data were scaled appropriately from earlier years.

#### **3.3.1 TOURISM DATA**

The analysis focuses on tourism data for the GBRCA, which is approximated by the sum of data for six Queensland tourism regions, namely Tropical North Queensland, Northern, Whitsunday, Mackay, Fitzroy and Bundaberg.

The major sources of tourism data used in this report are:<sup>5</sup>

- ❑ TSA national results for 2005-06 (ABS 5249.0, 2007);
- ❑ TRA online database for tourist activity to June 2007 (TRA 2007a);
- ❑ TRA CD-MOTA (Compact Disc – *Monitor of Tourist Activity*) to June 2006 (TRA 2006); and
- ❑ State and regional results to June 2007 (TRA 2007b, TRA 2007c) that are based on the National Visitor Survey (NVS) of domestic visitors and International Visitor Survey (IVS), together with application of the Regional Expenditure Model (REM).

The TSA presents tourism outputs, expenditures and employment nationally for 2005-06, classified to products according to ABS concepts of 'tourism characteristic' products and 'tourism connected' products, and similarly for industries. The TSA provides consumption by expenditure item for each of: day (domestic) visitors, overnight (domestic) visitors and international visitors.

The TSA makes use of TRA data, which is processed to conform with national accounts totals and balance of payments aggregates. A similar methodology is applied in this study to update the TSA estimate of tourism expenditure and employment from 2005-06 data to 2006-07, and to allocate expenditure in the GBRMCA to the appropriate place of residence.

#### **3.3.2 COMMERCIAL FISHING DATA**

Estimates for commercial fishing are based on the conventional supply-side analysis typical of industry studies. This involves estimating the gross value of production for the two types of commercial fishing taking place in the GBRMP: wild harvest and aquaculture.

The gross value of production for the commercial fishing industry within the GBRMP in 2006-07 was based on 'wild-harvest' data for 2006-07 received from DPI&F and extrapolation to 2006-07 of DPI&F Fisheries aquaculture data for 2003-04 to 2005-06.

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<sup>5</sup> A more detailed list of data sources is presented in Attachment B

### **3.3.3 RECREATIONAL USE DATA**

Recreational activities within the GBRMP include fishing, snorkelling, diving, boating, sailing, swimming, and tours to visit the reef or watch whales. These activities are split in this analysis into 'recreational fishing' and 'other recreational activity'.

Recreational fishing data were estimated by Access Economics and based on data provided by the DPI&F. Tourism and local recreational trips are closely related, with the distinction depending only on the distance of travel. Where these activities are undertaken by visitors, they are treated as tourism, however when they are undertaken by local residents they are classified as recreational use by local residents.

## **3.4 MAPPING TO IO SECTORS**

The second stage of the methodology relates to mapping the expenditure data to the appropriate sectors in the Input-Output (IO) table. The IO table used for this analysis is comprised of thirty individual goods and services as shown in Table 3.1. These sectoral classifications correspond to national accounting conventions.

The mapping used for this report requires some categorical redefinition from the supply industry categories included in the national accounts. For example, tourism, recreational fishing and other recreational activities are not an identifiable supply industry in the national accounts. These activities are defined instead on the demand side as a combination of products that are purchased by tourists (hotel accommodation, meals transport and the like). Commercial fishing, on the other hand, is contained within the agricultural sector under the national accounting conventions.

## **3.5 IO MODELLING OF DIRECT AND INDIRECT CONTRIBUTIONS**

The economic analysis is driven by access to IO modelling that is based on available IO data. Separate IO databases have been used for this analysis, covering three regions: the GBRCA, Queensland and Australia, with a base year of 2001-02. These data were produced by the Productivity Commission (2006) as part of the MMRF-NRA (Monash Multi-Regional Forecasting – National Reform Agenda) model and are based on Australia-wide ABS IO tables (ABS 5209.0, 2006).

The IO modelling measures the economic and financial value of the GBRMP, consistent with an accounting framework that avoids problems such as double-counting. The IO model calculates the direct and indirect economic contributions of activities within the GBRMP, expressed in terms of value added, Gross Area/State/Domestic Product (GAP/GSP/GDP) and employment.

Direct value added is calculated from the relevant industry outputs by subtracting out the costs of goods and services used in production, as estimated using production shares in IO tables. Direct GDP is calculated as the value added plus commodity taxes on expenditures (by tourists and households). Direct employment is calculated by multiplying the relevant industry outputs by employment per unit of output.

**TABLE 3.1: EXPENDITURE CATEGORIES BY ACTIVITY AND IO SECTOR**

<b>Sectors</b>	<b>Domestic Tourism</b>	<b>International Tourism</b>	<b>Commercial Fishing</b>	<b>Recreational Fishing</b>	<b>Other Recreational Activities</b>
Agriculture,forestry,fishing	X	X	X	X	
Mining	X	X			
Food and beverages	X	X		X	X
Textiles, clothing and footwear	X	X		X	X
Wood&paper manufacturing	X	X		X	
Petroleum products	X	X		X	X
Chemicals, rubber and plastic	X	X		X	X
Other non-metallic products	X	X			
Metals, metal products	X	X		X	X
Transport equipment	X	X		X	X
Other equipment	X	X		X	X
Other manufacturing	X	X		X	
Utilities		X			
Construction					
Wholesale trade					
Retail trade	X	X			
Mechanical repairs	X	X		X	X
Accommodation, cafes and restaurants	X	X		X	X
Land passenger transport	X	X			
Air passenger transport	X	X			
Freight					
Transport services	X	X		X	X
Communication services	X	X			
Finance services	X	X		X	X
Property&business services	X	X			X
Ownership of dwellings	X	X			
Government administration	X	X		X	X
Education	X	X			
Health	X	X			
Other services	X	X		X	

Note: X refers to mapping of industry specific expenditure.

The indirect value added of an industry is the sum of value added associated with the inputs of goods and services into that industry, together with the value added associated with inputs into those goods and services, and so on back through the production process. The complete calculation requires the tourism expenditure on each item to be traced back to each input used in its production, and the inputs used to create these inputs, back to the original inputs. Indirect contributions are calculated using mathematical operations on the IO tables and the relevant industry outputs.

The indirect contributions for Queensland are expected to be greater than for the GBRC, and the Australian indirect contributions to be larger again. This is because the larger the

area being considered, the larger the proportion of inputs that are supplied from within that area. For example, if a cheese used in a restaurant in the GBRCA was produced in Brisbane using milk from New South Wales, when considering GBRCA economic contribution, the cheese is considered an 'import' and only the additional retail mark-up in the restaurant would be counted as a contribution. Once we expand the geographical area, however, the value added in production would be included for the Queensland estimate, while the full value of the milk inputs would be included for the whole of Australia estimate.

The economic contributions were finally scaled by factors which make the Access Economics total indirect results for Australia consistent with the TRA total indirect results for Australia, adjusted from 2005-06 to 2006-07.

### **3.5.1 INPUT-OUTPUT TABLES AND EMPLOYMENT**

The employment data were based on ABS labour force data by industry (17 ANZSIC industries) and region (SD-based) for the years ending May 2002 and May 2007 (ABS 6291.0.55.003, August 2007). These were then mapped into the 30 IO industries used for this analysis. In all cases employment was expressed in full time equivalents (FTE), calculated as the number of full time persons plus half the number of part time persons.

## **3.6 LIMITATIONS OF THE ANALYSIS**

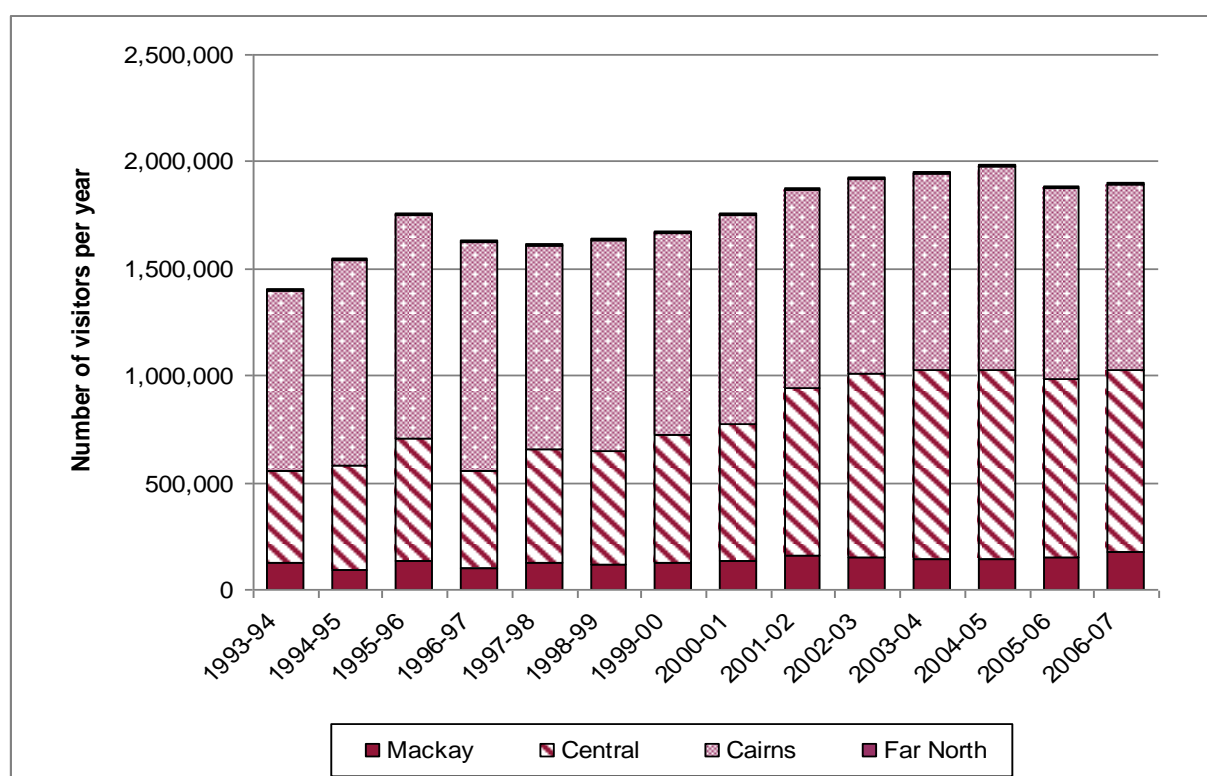
This report does not cover:

- ☐ Expenditures associated with other activities within the GBRMP such as management, monitoring and scientific research.
- ☐ A balance sheet analysis, identifying the value of the *stock* of assets contained within the GBRCA or the GBRMP at any point in time.
- ☐ Non-market activities for which imputed market values cannot readily be compiled (such as indigenous activities within the GBRCA, or any externality effects, which are likely to be substantial).
- ☐ Environmental accounting in the national accounts is still in its infancy, but it is a matter currently under investigation by the ABS (for example, see *Accounting for the environment in the national accounts*, ABS Cat 5206.0, June quarter 2002, pages 13-25).

## 4. ECONOMIC CONTRIBUTIONS FROM TOURISM IN THE GBRCA

Figure 4.1 shows GBRMPA records of visitors to the four GBRMPA management regions over the fourteen financial years to 2006-07, collected from registered operators. These include individuals on tours within the GBRMP and individuals that have been transferred between the mainland and islands located within the Park. An overnight visitor to an island would be counted at least twice, for the trips to and from the island, plus any additional tours taken from the island. The GBRMPA numbers are thus more like a count of the number of visitor days than the number of visitors. GBRMPA does not record numbers of visitors in private boats.

**FIGURE 4.1: NUMBER OF VISITS PER YEAR, BY GBRMPA MANAGEMENT REGION**



Source: GBRMPA, November 2007.

Total reef visits increased from 1.4 million in 1993-94 to almost 2 million in 2004-05. However there was a reduction of around 95,000 in 2005-06, with falls recorded in the major tourism regions of Cairns and Central, which includes Townsville. In 2006-07, there was an increase in visitor numbers for all regions except Cairns. Total recorded reef visits for 2006-07 were 1.915 million.

There have been changes over time in the composition of visits across the regions of the GBRCA. The numbers of visits to the Cairns region have been fairly constant, declining only slightly, but those to the Central region have increased, so that the visit shares in 2006-07 were Cairns 45%, Central 45%, Mackay 9% and Far North 0.4% compared with 60%, 31%, 9% and 0.5% respectively in 1993-94.

There are around 12 million tourism visits to the GBRCA each year but only 1.9 million visits to the reef. Both measures are mixtures of international, interstate, inter-regional and intraregional visits, but with changes in each driven, to some extent, by different factors.

## 4.1 TOURISM EXPENDITURE

The tourism expenditure data for different visitor types for 2006-07 are summarised in Table 4.1. The management regions defined by the GBRMPA of 'Far Northern' and 'Cairns' correspond to the 'Far North Queensland' tourism region, 'Central' corresponds to the tourism regions 'Northern' and 'Whitsundays', and 'Mackay' corresponds to the 'Mackay', 'Fitzroy' and 'Bundaberg' tourism regions.

Fitzroy and Tropical North Queensland attract most expenditure by day visitors in the Catchment area, while Tropical North Queensland accounts for the largest proportion of visitor expenditure. Domestic overnight visitors spent just over \$1.4 billion in Tropical North Queensland in 2006-07, representing 40% of domestic overnight visitor expenditure in the GBRCA in that year. International visitors spent just over \$1 billion in Tropical North Queensland in 2006-07.

The GBRCA accounts for a significant component of Australia's tourism expenditure. In 2006-07, the area accounted for 9.3% of holiday/leisure expenditure in Australia by international visitors. The GBRCA also accounts for 8.6% of total expenditure by Australian overnight visitors. Holiday/leisure visits account for an above-average proportion of domestic overnight visits to Tropical North Queensland and the Whitsundays.

**TABLE 4.1: TOURIST EXPENDITURE IN GBRCA TOURISM REGIONS, 2006-07 (\$MILLION)**

Tourism Region	Day	Domestic overnight	Interntl	Total	Day share (%)	Overnight share (%)	Interntl share (%)
Bundaberg	\$61	\$185	\$20	\$266	8%	5%	1%
Fitzroy	\$215	\$517	\$39	\$771	27%	14%	3%
Mackay	\$103	\$284	\$19	\$406	13%	8%	1%
Whitsundays	\$69	\$714	\$119	\$902	9%	19%	9%
Northern	\$125	\$530	\$83	\$738	16%	14%	6%
Tropical North Qld	\$220	\$1,474	\$1,085	\$2,779	28%	40%	79%
<b>Total GBRCA</b>	<b>\$793</b>	<b>\$3,704</b>	<b>\$1,366</b>	<b>\$5,863</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Australia	\$13,897	\$43,115	\$14,733	\$71,745			
GBRCA/Aust	5.7%	8.6%	9.3%	8.2%			

Source: TRA unpublished results from the Regional Expenditure Model. Data provided by Tourism Queensland.

Notes: Expenditures include packages and domestic airfares, but exclude international airfares, purchases of motor vehicles and rents. Domestic values include local expenditures before and after domestic trips. Totals may differ from sums of components due to rounding.

The recorded reductions in numbers of visitors to the reef in the Cairns and Central management regions between 2004-05 and 2006-07 are not reflected in the overall increases in GBRCA tourism expenditure.

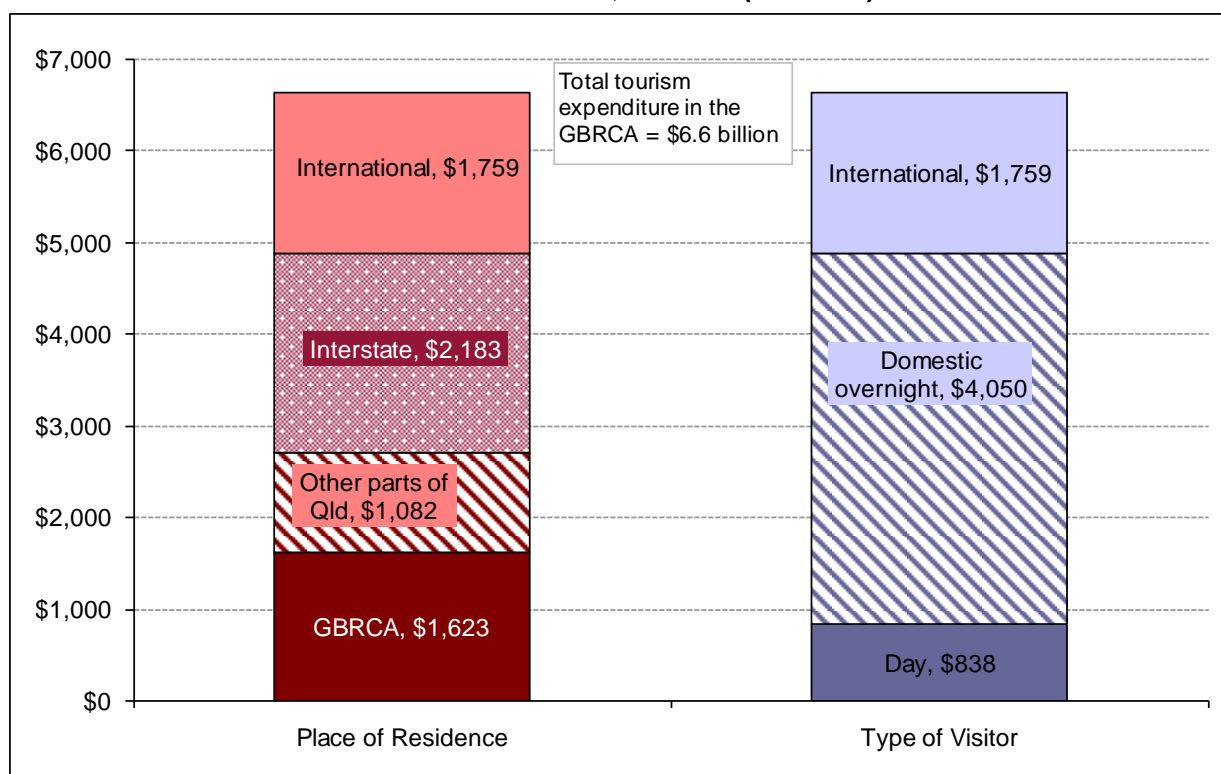
Figure 4.2 summarises total tourism expenditures within the GBRCA in 2006-07 for different places of residence of visitors, and for visitor type.<sup>6</sup> Domestic overnight visitors accounted for 61% of tourism expenditure in the GBRCA in 2006-07, with international visitors 26% and day visitors 13%. In terms of the usual residence of visitors, the largest proportions of GBRCA tourism expenditure in 2006-07 were by interstate visitors (33%), followed by

<sup>6</sup> TRA expenditures have been scaled to be consistent with TSA measures, thus the totals in Figure 4.2 differ from those in Table 4.1.

international visitors (26%), visitors from within the GBRCA (24%) and from other parts of Queensland (16%).

Of the domestic overnight expenditure, 58% was by interstate visitors, 22% by Queenslanders residing outside the GBRCA, and 20% by GBRCA residents (of which around 4% was expenditure by GBRCA residents for purposes of domestic tourism where they were leaving the GBRCA).

**FIGURE 4.2: TSA-CONSISTENT TOURISM EXPENDITURE IN THE GBRCA, BY PLACE OF RESIDENCE AND TYPE OF VISITOR, 2006-07 (\$MILLION)**



Source: Access Economics, derived using TRA REM, TRA CD-MOTA and online, and TSA.

## 4.2 ECONOMIC CONTRIBUTION OF TOURISM

The economic contributions of GBRCA tourism for 2006-07 are presented in Table 4.2 below. The contributions are estimated for three regions: the GBRCA, Queensland and Australia and are reported as direct, indirect and total (direct plus indirect) contributions. In addition to aggregate figures, estimates of the economic contribution of tourism have been isolated based upon the origin of the tourist. The origins presented are:

- ☐ travellers from within the GBRCA;
- ☐ travellers from the rest of Queensland;
- ☐ interstate travellers; and
- ☐ international travellers.

Results using three measurement methods are presented, these are value added, gross product, and the quantity of associated employment. As detailed earlier, value added is the most accurate and useful of these methods. All three measures, however, indicate that interstate travellers as a group contribute the most to the economy through tourism in the GBRCA in all means of contribution and for all regions of measurement.

The proportions of contributions accounted for by each type of visitor closely match the expenditure proportions in Figure 4.2, with interstate visitors accounting for around 34%, international visitors around 24%, GBRCA residents around 23% and visitors from the rest of Queensland around 17% of total economic contributions. These results are consistent across the value added and GAP/GSP/GDP measurements.

Strong consistency is exhibited between the results of the three measures of economic contribution as the region and nature of contribution change. Ratios of value added to gross product, in particular, are close, taking a value of 0.97 for each measure of indirect contribution, and varying only between 0.81 for the Australia-wide total contribution and 0.79 for the total GBRCA and Queensland contributions. The correlation with employment levels is not as strong, owing to differences in the relationship between labour and the amount of value added to the product across industries; however the consistency of these relationships is still strong enough to justify focussing attention on just the value added results.

One notable result is the change in the ratio of direct to indirect contributions to the economy as the region under consideration increases. For total tourism value added, the ratio of indirect contributions to direct contributions increases from 0.48 for the GBRCA through 0.61 for Queensland to 0.91 for Australia. This result follows the expectations about indirect contributions outlined in Section 3.5.

As is to be expected, at \$5,177 million the total economic contributions of tourism in the GBRCA to the Australian economy are in general greater than those for Queensland which, in turn, are greater than those for the GBRCA. Aside from the obvious increase due to the larger geographical region incorporated, this trend arises partly because Queensland and Australian estimates include larger proportions of airfares and other long distance travel expenses than have been assumed for the GBRCA. The vast majority of these increases, however, arise from indirect contributions through inputs into the production process.

The overall results suggest only a small increase in the economic contribution to Queensland relative to the GBRCA. Some of this is attributable to data quality; IO data for the GBRCA and Queensland are of a lower quality than for Australia as a whole, meaning some GBRCA and Queensland figures on interstate visitors have been held to be equal where this may not actually be the case. Further reliability questions arise for the larger regions due to assumptions made in adding extra airfares, while there remains uncertainty concerning the employment results for tourism due to the lack of precision of the method used to convert figures to Full Time Equivalents (FTEs).

Table 4.3 shows the distribution across IO industries of value added and employment contributions to tourism within the GBRCA for 2006-07. The direct contributions reflect the composition of tourism expenditures, the most significant being Accommodation, cafes and restaurants (26%), Retail trade (including takeaway meals) (15%) and Air passenger transport (14%). The value for Ownership of dwellings represents actual and imputed rent for holiday accommodation.

**TABLE 4.2: ECONOMIC CONTRIBUTIONS OF TOURISM TO THE GBRCA, QUEENSLAND AND AUSTRALIA, 2006-07**

<i>GBRCA/GBRMP activity</i>	<i>GBRCA Value Added (\$m)</i>	<i>Queensland Value Added (\$m)</i>	<i>Australia Value Added (\$m)</i>	<i>GBRCA GAP (\$m)</i>	<i>Queensland GSP (\$m)</i>	<i>Australia GDP (\$m)</i>	<i>GBRCA Employment (FTE 000)</i>	<i>Queensland Employment (FTE 000)</i>	<i>Australia Employment (FTE 000)</i>
<b><i>Direct contributions</i></b>									
Visitors from GBRCA	507	507	575	677	677	744	5.8	5.8	6.0
Visitors from rest of Queensland	375	420	461	478	533	573	4.0	4.4	4.5
Interstate visitors	787	787	966	976	976	1,173	8.1	8.2	9.2
International visitors	589	600	680	716	732	818	6.7	6.9	7.1
<b>GBRCA total tourism</b>	<b>2,257</b>	<b>2,314</b>	<b>2,682</b>	<b>2,847</b>	<b>2,918</b>	<b>3,306</b>	<b>24.6</b>	<b>25.3</b>	<b>26.7</b>
<b><i>Indirect contributions</i></b>									
Visitors from GBRCA	258	322	555	269	335	576	2.9	3.5	5.4
Visitors from rest of Queensland	178	254	414	185	265	431	2.0	2.8	4.0
Interstate visitors	371	471	859	382	487	891	4.2	5.1	8.3
International visitors	281	361	607	286	369	621	3.2	4.0	5.9
<b>GBRCA total tourism</b>	<b>1,087</b>	<b>1,408</b>	<b>2,435</b>	<b>1,122</b>	<b>1,455</b>	<b>2,519</b>	<b>12.3</b>	<b>15.4</b>	<b>23.6</b>
<b><i>Direct plus indirect contributions</i></b>									
Visitors from GBRCA	765	829	1,130	946	1,012	1,320	8.7	9.4	11.4
Visitors from rest of Queensland	552	675	875	663	797	1,003	6.0	7.2	8.5
Interstate visitors	1,158	1,258	1,825	1,358	1,463	2,063	12.2	13.3	17.5
International visitors	869	961	1,287	1,002	1,101	1,439	9.9	10.8	13.0
<b>GBRCA total tourism</b>	<b>3,344</b>	<b>3,722</b>	<b>5,117</b>	<b>3,970</b>	<b>4,373</b>	<b>5,825</b>	<b>36.9</b>	<b>40.7</b>	<b>50.3</b>

Source: Access Economics. All magnitudes are to the nearest \$million. Totals may not add due to rounding.

Note: For visitors from the GBRCA and interstate, the value added contributions to the GBRCA and Queensland are equal because the tourism demands were equal and the GBRCA IO table was constructed with the same cost shares in each industry as in the Queensland IO table.

**TABLE 4.3: ECONOMIC CONTRIBUTIONS OF TOURISM TO THE GBRCA, BY IO INDUSTRY, 2006-07**

<i>Input-output industry</i>	<i>Direct value added (\$m)</i>	<i>Indirect value added (\$m)</i>	<i>Direct employment FTE</i>	<i>Indirect employment FTE</i>	<i>Direct value added (%)</i>	<i>Indirect value added (%)</i>	<i>Direct employment (%)</i>	<i>Indirect employment (%)</i>
Agriculture, forestry and fishing	41	79	0.4	0.9	2%	7%	1%	8%
Mining	5	22	0.0	0.0	0%	2%	0%	0%
Food and beverages	82	55	0.6	0.5	4%	5%	2%	4%
Textiles, clothing and footwear	15	2	0.1	0.0	1%	0%	1%	0%
Wood and paper manufacturing	38	41	0.3	0.3	2%	4%	1%	3%
Petroleum products	20	8	0.1	0.1	1%	1%	1%	1%
Chemicals, rubber and plastic	21	12	0.1	0.1	1%	1%	1%	1%
Other non-metallic products	1	6	0.0	0.0	0%	1%	0%	0%
Metals, metal products	4	13	0.0	0.1	0%	1%	0%	1%
Transport equipment	7	24	0.1	0.2	0%	2%	0%	2%
Other equipment	8	8	0.1	0.1	0%	1%	0%	1%
Other manufacturing	10	2	0.1	0.0	0%	0%	0%	0%
Utilities	3	13	0.0	0.0	0%	1%	0%	0%
Construction	0	30	0.0	0.4	0%	3%	0%	4%
Wholesale trade	103	97	0.8	0.9	5%	9%	3%	8%
Retail trade	344	83	6.1	1.8	15%	8%	25%	16%
Mechanical repairs	16	34	0.3	0.8	1%	3%	1%	7%
Accommodation, cafes and restaurants	591	17	8.9	0.3	26%	2%	36%	3%
Land passenger transport	54	1	0.4	0.0	2%	0%	2%	0%
Air passenger transport	311	2	2.7	0.0	14%	0%	11%	0%
Freight	31	44	0.3	0.5	1%	4%	1%	4%
Transport services	42	58	0.3	0.5	2%	5%	1%	4%
Communication services	22	48	0.1	0.4	1%	4%	1%	3%
Finance services	6	47	0.0	0.2	0%	4%	0%	2%
Property and business services	57	278	0.4	2.5	3%	26%	2%	22%
Ownership of dwellings	188	0	0.0	0.0	8%	0%	0%	0%
Government administration	10	9	0.1	0.1	0%	1%	0%	1%
Education	40	13	0.4	0.2	2%	1%	2%	1%
Health	59	3	0.7	0.0	3%	0%	3%	0%
Other services	129	39	1.1	0.4	6%	4%	5%	4%
<b>Total GBRCA</b>	<b>2257</b>	<b>1087</b>	<b>24.6</b>	<b>11.5</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Access Economics. Values are rounded to the nearest \$m so that zero means less than \$0.5m. Totals may not add due to rounding.

The distribution of indirect contributions across industries differs markedly, with the largest contributions being from Property and business services (26%), Wholesale trade (9%), Retail trade (8%) and Agriculture, forestry and fishing (7%).

In 2005-06, the total direct value added to the Australian economy by tourism was \$31,293 million. In GDP measures, this contribution was \$37,592, while 464,500 Australians were employed in tourism (ABS 5259.0, 2007, Tables 1, 16 and 10)<sup>7</sup>. Many of these employees were employed on a part-time basis, and it is estimated that the full-time equivalent, as used throughout this report, is approximately 81% of this, or 376,000 FTEs.

<sup>7</sup> The TSA values for 2005-06 differ considerably from the 2004-05 TSA values used in the Access Economics report for 2005-06 (2007), because of revisions to the National Accounts data underlying the TSA analysis. The TSA 2005-06 values are larger than the revised TSA values for 2004-05 by 5.1% for value added and 1.3% for employment.

In order to calculate the GBRCA share of national tourism, corresponding values for 2006-07 are required. It is also necessary to exclude the contributions from overall tourism figures that are attributable to Australian residents on outbound trips. After removing these and scaling 2005-06 results using estimates of proportional changes in expenditures, Access Economics estimated that the contribution of tourism to the Australian economy in 2006-07 was around \$32,200 million using value added measures, or a \$38,600 million contribution to GDP. The corresponding employment was estimated at 364,000 FTEs.

Based upon the results presented in Table 4.2, we are able to express the contribution of tourism in the GBRCA as a proportion of the total estimated contribution of tourism to the Australian economy in 2006-07. The value added share of tourism to the GBRCA was 7.0%, and the contribution of GBRCA tourism to the Australian total was 8.3%. As measured in GDP contribution to the Australian tourism industry, GBRCA tourism accounted for 8.6%, and 8.6% for FTE tourism employment.

Further measures of the GBRMP/GBRCA contribution to Australian tourism and the economy, including net trade contributions, are reported in Attachment C.

## 5. ECONOMIC CONTRIBUTIONS FROM COMMERCIAL FISHING IN THE GBRMP

Table 5.1 shows the estimated gross value of production (GVP) for 'wild-harvest' commercial fishing within the GBRMP was \$114 million for 2006-07. This figure is an increase relative to the two previous financial years, but still lower than the \$148 million reported in 2003-04 (DPI&F Fisheries unpublished data). The largest contributions are from prawns and coral trout, but the values also include many other fish species.

**TABLE 5.1: COMMERCIAL FISHING IN THE GBRMP, GROSS VALUE OF PRODUCTION, COMPONENTS, 2004-05 TO 2006-07, \$ MILLION**

<i>GBRMP commercial fishing activity</i>	<i>2004-05 \$m</i>	<i>2005-06 \$m</i>	<i>2006-07 \$m</i>
GBRMP wild-harvest	112	104	114
GBRMP aquaculture	49	51	51
<b>Total GBRMP commercial fishing</b>	<b>161</b>	<b>155</b>	<b>165</b>

Source: DPI&F Fisheries, Access Economics estimate for aquaculture 2006-07.

It should be noted that these values for past years are considerably less than those provided previously by Fisheries due to revisions to prices:

*A new price series was implemented in July 2006 in conjunction with the Queensland Seafood Marketers Association. The organisation provides "typical" prices paid to commercial fishers at wharf for key species by grade for each quarter by region. As a result of this arrangement and due to changes in the market compared to previous years the prices used for crabs, tropical rock lobster and (live) coral trout have been increased substantially. (DPI&F Prospects, September 2007, p. 45)*

According to DPI&F Prospects, the harvest weight declined in 2006-07 by about 14% compared with the previous two years. However, due to differences in performance and demand across sectors, notably the high world demand for live coral trout, GVP still increased. In most other sectors, high fuel prices, shortages in skilled labour, restrictions on catches and fishing areas, and cheaper imported fish prices led to reduced fishing effort so that catches declined and quotas were not filled, reducing GVP.

Most GBRCA aquaculture is based on the coast and impacts directly on the GBRMP, so it is appropriate to use it as a measure for this report. Data on the farm gate value of aquaculture is available to 2005-06 (Lobegeiger & Wingfield, 2007). On the basis of the sums of values for the Far Northern, Northern, Mackay and Fitzroy SDs for the three financial years prior to 2006-07 we have assumed that the farm gate value of GBRMP aquaculture was \$51 million in 2006-07 (Table 5.1).

It is assumed that the same expenditures, equal to gross value of production, apply for Queensland and Australia however this is not strictly correct as we have not allowed for fishing licence fees and boat registration fees, omitted as they add to less than \$1 million.

The total gross value of production for commercial fishing, including aquaculture, was \$165 million in 2006-07. Our analysis is restricted to the gross value of production of commercial fishing through to the stage of selling the fish on the wharf or at the farm gate. It excludes

the contributions of processing, marketing and transport however these are believed to be relatively small.

The economic contributions of commercial fishing within the GBRMP are presented in Table 5.2. After deducting input costs, the direct contribution of commercial fishing to value added in the GBRCA was \$89 million in 2006-07. The direct contributions to the GBRCA, Queensland and Australia were nearly equal, as expected, because the industry outputs used were equal.

**TABLE 5.2: ECONOMIC CONTRIBUTIONS TO THE GBRCA, QUEENSLAND AND AUSTRALIA OF COMMERCIAL FISHING IN THE GBRMP, 2006-07**

	<i>Economic contribution to GBRMP</i>	<i>Economic contribution to Queensland</i>	<i>Economic contribution to Australia</i>
Value added (\$m)			
direct	89	89	87
indirect	28	34	52
combined	117	124	139
GAP/GSP/GDP (\$m)			
direct	90	90	90
indirect	28	35	53
combined	118	125	143
Employment (FTE, 000)			
direct	1.2	1.2	1.2
indirect	0.3	0.4	0.5
combined	1.5	1.6	1.7

Source: Access Economics. Totals may differ from sums of components due to rounding.

Table 5.3 shows the distribution across IO industries of value added and employment contributions to commercial fishing within the GBRCA for 2006-07. The direct contributions correspond to the fishing industry itself. The indirect contributions are dominated by intra-industry inputs of Agriculture, forestry and fishing (38%), with the next largest contributions from Property and business services (11%) and Wholesale trade (10%).

Additional measures associated with commercial fishing within the GBRMP are reported in Attachment C.

**TABLE 5.3: ECONOMIC CONTRIBUTIONS TO THE GBRCA OF COMMERCIAL FISHING IN THE GBRMP, BY IO INDUSTRY, 2006-07**

<i>Input-output industry</i>	<i>Direct value added (\$m)</i>	<i>Indirect value added (\$m)</i>	<i>Direct employment ent FTE</i>	<i>Indirect employment ent FTE</i>	<i>Direct value added (%)</i>	<i>Indirect value added (%)</i>	<i>Direct employment ent (%)</i>	<i>Indirect employment ent (%)</i>
Agriculture, forestry and fishing	89	10	1.2	0.1	100%	38%	100%	38%
Mining	0	0	0.0	0.0	0%	1%	0%	0%
Food and beverages	0	1	0.0	0.0	0%	3%	0%	3%
Textiles, clothing and footwear	0	0	0.0	0.0	0%	0%	0%	0%
Wood and paper manufacturing	0	0	0.0	0.0	0%	1%	0%	1%
Petroleum products	0	0	0.0	0.0	0%	1%	0%	1%
Chemicals, rubber and plastic	0	1	0.0	0.0	0%	4%	0%	3%
Other non-metallic products	0	0	0.0	0.0	0%	0%	0%	0%
Metals, metal products	0	0	0.0	0.0	0%	1%	0%	1%
Transport equipment	0	0	0.0	0.0	0%	1%	0%	1%
Other equipment	0	0	0.0	0.0	0%	1%	0%	1%
Other manufacturing	0	0	0.0	0.0	0%	0%	0%	0%
Utilities	0	0	0.0	0.0	0%	1%	0%	0%
Construction	0	1	0.0	0.0	0%	2%	0%	2%
Wholesale trade	0	3	0.0	0.0	0%	10%	0%	8%
Retail trade	0	1	0.0	0.0	0%	5%	0%	11%
Mechanical repairs	0	1	0.0	0.0	0%	3%	0%	7%
Accommodation, cafes and restaurants	0	0	0.0	0.0	0%	1%	0%	2%
Land passenger transport	0	0	0.0	0.0	0%	0%	0%	0%
Air passenger transport	0	0	0.0	0.0	0%	0%	0%	0%
Freight	0	1	0.0	0.0	0%	4%	0%	4%
Transport services	0	1	0.0	0.0	0%	2%	0%	2%
Communication services	0	1	0.0	0.0	0%	2%	0%	2%
Finance services	0	2	0.0	0.0	0%	6%	0%	3%
Property and business services	0	3	0.0	0.0	0%	11%	0%	9%
Ownership of dwellings	0	0	0.0	0.0	0%	0%	0%	0%
Government administration	0	0	0.0	0.0	0%	0%	0%	0%
Education	0	0	0.0	0.0	0%	1%	0%	1%
Health	0	0	0.0	0.0	0%	1%	0%	1%
Other services	0	0	0.0	0.0	0%	1%	0%	1%
<b>Total GBRCA</b>	<b>89</b>	<b>28</b>	<b>1.2</b>	<b>0.3</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

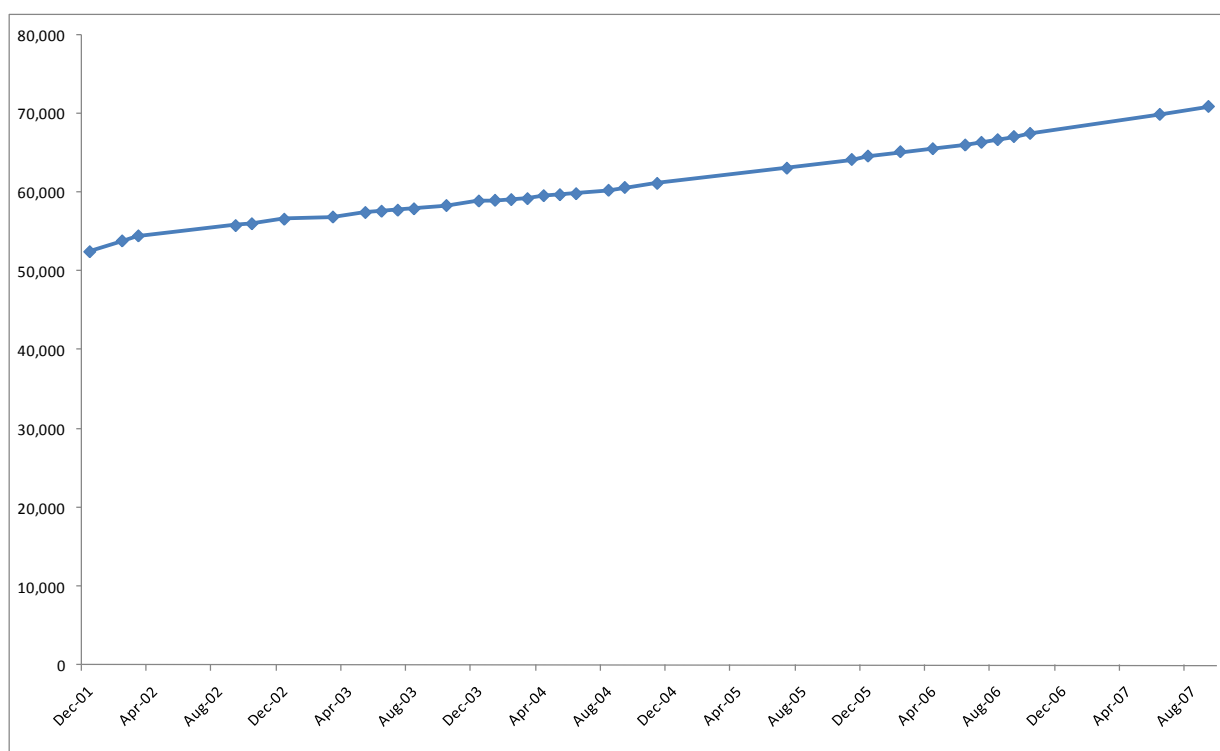
Source: Access Economics. Values are rounded to the nearest \$m so that zero means less than \$0.5m. Totals may not add due to rounding.

## 6. ECONOMIC CONTRIBUTIONS FROM RECREATIONAL USE OF THE GBRMP

Recreational use of the GBRMP comprises fishing, boating, diving and other water activities, and tours undertaken by non-tourists, meaning the activity is performed by local residents. The same activities performed by visitors would be classified as tourism.

Boats account for a large proportion of recreational expenditure in the GBRMP. The steady increase in the number of recreational vessels registered within the GBRCA is shown in Figure 6.1. Recreational vessels registered within the GBRCA account for approximately one third of vessel registrations in Queensland.

**FIGURE 6.1: RECREATIONAL VESSEL REGISTRATIONS FOR GBR COASTAL COMMUNITIES**



Source: Queensland Transport data provided to GBRMPA.

Note: Registered vessels include motorboats, sailboats, speedboats and jetskis.

The registrations at September 2007 were composed of motor boats (9%), speed boats (86%), sail boats (3%) and jetskis (2%) (Queensland Transport, Marine Safety). It is assumed that most motor boats (motor less than 6 horsepower) and speed boats (motor greater than 6 horsepower and/or capable of speeds above 10 knots) are used for fishing to some extent.

### 6.1 EXPENDITURES ON RECREATIONAL USE

The contribution of recreational activity within the GBRMP was calculated in two parts, “recreational fishing” and “other recreational activities”. Some recreational expenditure was already included in tourism estimates, and this was subtracted from total recreational expenditure in order to obtain an estimate for recreational use by local residents.

DPI&F Fisheries has provided unpublished recreational fishing information from its 2005 recreational fishing survey. Expenditure on boat purchases was by far the largest item, but it appeared to be abnormally high compared with 2002 data. The value for boat purchases was halved to provide a more conservative estimate (personal communication, Len Olyott). DPI&F provided estimates of the proportions of boat-related expenses that could be attributed to fishing, which were mapped into the IO industries used in our analysis.

The recreational fishing data are presented according to the place of residence rather than where the fish are caught. They thus exclude tourists visiting from outside the GBRCA, however do include those GBRCA residents who would be classified as tourists.

Access Economics estimates that total expenditure on recreational fishing in 2006-07 by GBRCA residents was around \$293 million. Adjusting for the 39.5% of fishing trips for those GBRCA residents classified as tourists (DPI&F survey data), expenditure on recreational fishing was approximately \$177 million.

For comparison, Henry and Lyle (2003) estimated total expenditure on recreational fishing in Queensland in 2000-01 to be \$320 million. Given that the GBRCA accounts for about one third of registered recreational boats in Queensland, this corresponds to expenditure on recreational fishing in the GBRCA of about \$110 million.

Table 6.1 summarises Access Economics' estimates of expenditure on recreational activities within the GBRMP, split into recreational fishing and other activities.

**TABLE 6.1: ESTIMATED EXPENDITURE ON RECREATIONAL USE OF THE GBRMP, COMPONENTS, 2004-05 TO 2006-07, \$MILLION**

<b><i>GBRMP recreational activity</i></b>	<b><i>2004-05</i></b>	<b><i>2005-06</i></b>	<b><i>2006-07</i></b>
GBRMP recreational fishing	155	166	177
GBRMP other recreational activity	91	98	105
<b>Total GBRMP recreational activity</b>	<b>246</b>	<b>264</b>	<b>281</b>

Source: Access Economics estimates, based partly on DPI&F Fisheries recreational fishing data.

There are no firm data for expenditure on other recreational activities within the GBRMP. Estimates for boats were based on those DPI&F Fisheries power boat expenditures that were not attributed to fishing, plus an estimate for sail boats and jetskis. In addition, Access Economics devised estimates for other items such as fuel, food, drink, clothing, diving gear and tours. Estimated expenditure in 2006-07 was \$105 million.

## 6.2 ECONOMIC CONTRIBUTIONS OF RECREATIONAL USE

The economic contributions for recreational use of the GBRMP are presented in Table 6.2. Fishing accounted for 63% of total expenditure on recreational activity, and for all measures of total economic contribution.

The direct contributions to the GBRCA, Queensland and Australia were approximately equal, as expected, because the industry outputs used in the analysis were equal. The estimated direct value added contributions of recreational activities within the GBRMP in 2006-07 totalled \$61 million for the region, and \$72 million for Australia. The small size of these values compared with the expenditures is due partly to relatively large proportions of imports in the costs of production. The larger values for Australia are due to the use of a different IO table.

**TABLE 6.2: ECONOMIC CONTRIBUTIONS TO THE GBRMP, QUEENSLAND AND AUSTRALIA OF RECREATIONAL USE OF THE GBRMP BY GBRCA RESIDENTS, 2006-07**

<i>Type of contribution</i> <i>activity</i>	<i>Economic contribution to GBRMP</i>	<i>Economic contribution to Queensland</i>	<i>Economic contribution to Australia</i>
<b>Direct contributions</b>			
Value added (\$m)			
recreational fishing	39	39	46
other recreational activities	23	23	26
total recreational activities	61	61	72
GAP/GSP/GDP (\$m)			
recreational fishing	52	52	59
other recreational activities	32	32	36
total recreational activities	84	84	95
Employment (FTE. 000)			
recreational fishing	0.6	0.6	0.6
other recreational activities	0.3	0.3	0.3
total recreational activities	0.9	0.9	0.9
<b>Indirect contributions</b>			
Value added (\$m)			
recreational fishing	22	28	51
other recreational activities	13	17	30
total recreational activities	36	45	81
GAP/GSP/GDP (\$m)			
recreational fishing	23	29	52
other recreational activities	14	18	32
total recreational activities	37	46	84
Employment (FTE. 000)			
recreational fishing	0.3	0.3	0.5
other recreational activities	0.2	0.2	0.3
total recreational activities	0.4	0.5	0.8
<b>Direct plus indirect contributions</b>			
Value added (\$m)			
recreational fishing	61	66	96
other recreational activities	36	39	57
total recreational activities	97	106	153
GAP/GSP/GDP (\$m)			
recreational fishing	75	80	111
other recreational activities	46	50	68
total recreational activities	121	130	179
Employment (FTE. 000)			
recreational fishing	0.8	0.9	1.1
other recreational activities	0.5	0.5	0.6
total recreational activities	1.3	1.4	1.7

Source: Access Economics. Totals may differ from sums of components due to rounding.

Table 6.3 shows the distribution across IO industries of value added and employment contributions for total recreational use of the GBRMP by local residents in 2006-07. The largest direct value added contributions are for Wholesale trade (23%), Retail trade (21%) and Transport equipment (14%). The indirect contributions are dominated by Property and business services (28%) and Wholesale trade (11%).

It is noted that the direct value added contribution for other recreational services calculated in the same way as in the previous reports was \$332 million. The new, smaller value of \$97 million, while subject to some uncertainty, is a far more realistic estimate of the contribution from the GBRMP.

**TABLE 6.3: ECONOMIC CONTRIBUTIONS TO THE GBRCA OF RECREATIONAL USE OF THE GBRMP BY GBRCA RESIDENTS, BY IO INDUSTRY, 2006-07**

<i>Input-output industry</i>	<i>Direct value added (\$m)</i>	<i>Indirect value added (\$m)</i>	<i>Direct employment FTE</i>	<i>Indirect employment FTE</i>	<i>Direct value added (%)</i>	<i>Indirect value added (%)</i>	<i>Direct employment (%)</i>	<i>Indirect employment (%)</i>
Agriculture, forestry and fishing	1	1	0.0	0.0	1%	4%	1%	4%
Mining	0	1	0.0	0.0	0%	2%	0%	0%
Food and beverages	2	1	0.0	0.0	3%	2%	2%	2%
Textiles, clothing and footwear	0	0	0.0	0.0	1%	0%	0%	0%
Wood and paper manufacturing	0	1	0.0	0.0	0%	4%	0%	3%
Petroleum products	1	0	0.0	0.0	2%	0%	1%	0%
Chemicals, rubber and plastic	1	0	0.0	0.0	1%	1%	1%	1%
Other non-metallic products	0	0	0.0	0.0	0%	1%	0%	1%
Metals, metal products	1	1	0.0	0.0	1%	3%	1%	2%
Transport equipment	8	1	0.2	0.0	14%	2%	10%	2%
Other equipment	2	0	0.0	0.0	3%	1%	2%	1%
Other manufacturing	2	0	0.0	0.0	3%	0%	2%	0%
Utilities	0	0	0.0	0.0	0%	1%	0%	0%
Construction	0	1	0.0	0.0	0%	3%	0%	4%
Wholesale trade	14	4	0.2	0.0	23%	11%	16%	10%
Retail trade	13	2	0.5	0.1	21%	7%	33%	14%
Mechanical repairs	5	1	0.2	0.0	9%	3%	16%	7%
Accommodation, cafes and restaurants	2	0	0.1	0.0	3%	1%	4%	3%
Land passenger transport	0	0	0.0	0.0	0%	0%	0%	0%
Air passenger transport	0	0	0.0	0.0	0%	0%	0%	0%
Freight	2	1	0.0	0.0	3%	4%	2%	4%
Transport services	2	2	0.0	0.0	4%	6%	2%	4%
Communication services	0	2	0.0	0.0	0%	5%	0%	4%
Finance services	2	2	0.0	0.0	3%	5%	1%	2%
Property and business services	1	10	0.0	0.1	1%	28%	0%	24%
Ownership of dwellings	0	0	0.0	0.0	0%	0%	0%	0%
Government administration	4	0	0.1	0.0	6%	1%	5%	1%
Education	0	0	0.0	0.0	0%	1%	0%	1%
Health	0	0	0.0	0.0	0%	0%	0%	0%
Other services	0	1	0.0	0.0	0%	2%	0%	2%
<b>Total GBRCA</b>	<b>61</b>	<b>36</b>	<b>1.5</b>	<b>0.4</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Access Economics. Values are rounded to the nearest \$m so that zero means less than \$0.5m. Totals may not add due to rounding.

Additional measures associated with recreational activity are reported in Attachment C.

## 7. CONCLUSIONS, CAVEATS & FURTHER WORK NEEDED

Access Economics has calculated the economic contributions to the GBRCA, Queensland and Australia of GBRCA tourism, GBRMP commercial fishing and GBRMP recreational activity in 2006-07. Table 7.1 summarises the total (direct plus indirect) value added contributions for the various activities. The patterns of results for GAP/GSP/GDP and employment are similar.

**TABLE 7.1: DIRECT PLUS INDIRECT VALUE ADDED CONTRIBUTIONS OF SELECTED GBRCA ACTIVITIES TO THE GBRCA, QUEENSLAND AND AUSTRALIA, 2006-07, \$MILLION**

<i>GBRCA/GBRMP Activity</i>	<i>Total value added contribution to GBRCA</i>	<i>Total value added contribution to Queensland</i>	<i>Total value added contribution to Australia</i>	<i>Ratio GBRCA/ Australia</i>	<i>Ratio Queensland/ Australia</i>
<i>Total tourism within the GBRCA</i>					
Visitors from GBRCA	765	829	1,130	0.68	0.73
Visitors from rest of Queensland	552	675	875	0.63	0.77
Interstate visitors	1,158	1,258	1,825	0.63	0.69
International visitors	869	961	1,287	0.68	0.75
<b>GBRCA total tourism</b>	<b>3,344</b>	<b>3,722</b>	<b>5,117</b>	<b>0.65</b>	<b>0.73</b>
GBRMP commercial fishing	117	124	139	0.84	0.89
GBRMP recreational fishing	61	66	96	0.63	0.69
GBRMP other recreational use	36	39	57	0.63	0.69
<b>Total contribution to GBRCA</b>	<b>3,558</b>	<b>3,951</b>	<b>5,409</b>	<b>0.66</b>	<b>0.73</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

Table 7.1 shows that:

- ❑ For GBRCA tourism, total value added contributions in 2006-07 were around \$3.3 billion for the GBRCA, \$3.7 billion for Queensland and \$5.1 billion for Australia.
- ❑ For GBRMP commercial fishing plus GBRMP recreational activities, total value added contributions in 2006-07 were around \$0.2 billion for the GBRCA, \$0.2 billion for Queensland and \$0.3 billion for Australia.
- ❑ Summed across tourism, commercial fishing and recreational activities, total value added contributions in 2006-07 were around \$3.6 billion for the GBRCA, \$4.0 billion for Queensland and \$5.4 billion for Australia.
- ❑ The corresponding sums across tourism, fishing and recreation for GAP/GSP/GDP were \$4.2 billion for the GBRCA, \$4.6 billion for Queensland and \$6.1 billion for Australia.
- ❑ The corresponding sums across tourism, fishing and recreation for employment, measured in full-time equivalent persons, were 40,000 for the GBRCA, 44,000 for Queensland and 54,000 for Australia.

The relative contributions of direct and indirect value added are summarised in Table 7.2. Indirect tourism contributions accounted for 32% of total tourism contributions for the GBRCA, 38% for Queensland and 48% for Australia. The corresponding proportions were 28%, 33% and 43% for GAP/GSP/GDP and 32%, 36% and 45% for employment. Different proportions applied for commercial fishing and recreational use.

**TABLE 7.2: RATIO OF INDIRECT TO DIRECT VALUE ADDED CONTRIBUTIONS, BY ACTIVITY AND REGION, 2006-07**

<i>Activity</i>	<i>Value added contribution to GBRCA</i>	<i>Value added contribution to Queensland</i>	<i>Value added contribution to Australia</i>
GBRCA total tourism	0.48	0.61	0.91
GBRMP commercial fishing	0.31	0.38	0.59
GBRMP recreational use	0.58	0.73	1.12

Source: Access Economics.

## **7.1 COMPARISON WITH OTHER INDUSTRIES WITHIN THE GBRCA**

The economic contribution of the GBRMP in relation to total economic activity within the GBRCA is illustrated in Table 7.3 which summarises the direct contributions (value added and employment) of all economic activities in the GBRCA together with those for the GBRMP.

The contributions of tourism to the GBRCA and of commercial fishing, recreational fishing and other recreational activity to the GBRMP are shown at the bottom of the table for comparison.

These last four industries should not be simply added to those standard ANZSIC industries shown in the table as adding to 'total GBRCA'. That would result in double counting in the table. For example, commercial fishing is part of the 'agriculture, forestry and fishing' industry. Tourism is spread over many industries, with major contributions to 'Air passenger transport', 'Accommodation, cafes and restaurants' and, 'Retail Trade'.

The importance of tourism as a proportion of the GBRCA economy is greater than it is as a proportion of the Australian economy. In terms of direct value added, tourism accounted for 5.0% of the GBRCA economy in 2006-07 (Table 7.3) but only 3.5% of the national economy in 2005-06 (ABS 5249.0, 2007, Table 1).

**TABLE 7.3: DIRECT VALUE ADDED AND EMPLOYMENT BY INDUSTRY, GBRCA, 2006-07**

<i>Industry</i>	<i>Value added</i>	<i>Employment</i>	<i>Value added</i>	<i>Employment</i>
<i>Direct Economic Contribution</i>			<i>Share of total</i>	<i>Share of total</i>
	<i>(\$m)</i>	<i>FTE 000</i>	<i>(%)</i>	<i>(%)</i>
Agriculture, forestry and fishing	2,124	17.4	4.7%	3.5%
Mining	11,664	56.0	26.1%	11.3%
Food and beverages	1,340	16.5	3.0%	3.3%
Textiles, clothing and footwear	37	0.5	0.1%	0.1%
Wood and paper manufacturing	354	4.2	0.8%	0.8%
Petroleum products	86	1.0	0.2%	0.2%
Chemicals, rubber and plastic	235	2.8	0.5%	0.6%
Other non-metallic products	164	1.8	0.4%	0.4%
Metals, metal products	1,147	12.2	2.6%	2.5%
Transport equipment	230	3.1	0.5%	0.6%
Other equipment	219	3.2	0.5%	0.7%
Other manufacturing	92	1.3	0.2%	0.3%
Utilities	1,826	8.5	4.1%	1.7%
Construction	2,768	54.6	6.2%	11.0%
Wholesale trade	1,409	17.2	3.1%	3.5%
Retail trade	1,597	27.9	3.6%	5.6%
Mechanical repairs	538	10.6	1.2%	2.2%
Accommodation, cafes and restaurants	994	13.6	2.2%	2.8%
Land passenger transport	257	3.6	0.6%	0.7%
Air passenger transport	96	1.5	0.2%	0.3%
Freight	1,469	22.3	3.3%	4.5%
Transport services	694	8.2	1.6%	1.7%
Communication services	460	4.3	1.0%	0.9%
Finance services	1,109	13.5	2.5%	2.7%
Property and business services	3,355	48.2	7.5%	9.7%
Ownership of dwellings	2,865	0.0	6.4%	0.0%
Government administration	2,202	43.6	4.9%	8.8%
Education	1,825	33.4	4.1%	6.7%
Health	2,304	45.0	5.2%	9.1%
Other services	1,274	18.8	2.8%	3.8%
<b>Total GBRCA</b>	<b>44,735</b>	<b>494.6</b>	<b>100.0%</b>	<b>100.0%</b>
GBRCA tourism	2,257	24.6	5.0%	5.0%
GBRMP commercial fishing	89	1.2	0.2%	0.2%
GBRMP recreational fishing	39	0.6	0.1%	0.1%
GBRMP other recreation	23	0.3	0.1%	0.1%

Source: Access Economics. Totals may differ from sums of components due to rounding.

## 7.2 COMPARISONS WITH THE ACCESS ECONOMICS REPORT FOR 2004-05 AND 2005-06

Table 7.4 contains a summary of the direct and indirect contributions of the GBRMP estimates over the last three-year reports (2004-05, 2005-06 and 2006-07). In some cases, the differences between results are significant. For example, the estimated contribution of commercial fishing has dropped significantly from 2005-06 to 2006-07. The estimates differ across years for two reasons. First, changes in expenditure estimates driven by growth, or decline, in key activities. Second, changes in the methodology employed that represent improvements over time in the estimation technique developed by Access Economics.

The following is a list of the key methodological changes for this report:<sup>8</sup>

- ❑ The 2004-05 and 2005-06 data included contributions arising from expenditure by GBRCA residents before and after travel abroad. These have been omitted from the 2006-07 analysis.
- ❑ The total direct value added tourism contributions to the GBRCA, after subtracting out the effects of GBRCA residents travelling abroad, were \$1,908 billion, \$2,071 billion and \$2,257 billion for the three financial years. Contributions for international visitors in 2006-07 have changed little, whereas those for domestic visitors have increased.
- ❑ The decline in direct value added for commercial fishing from \$133 million in 2004-05 to \$116 million in 2005-06 was driven by the reduction in the catch measured in tonnes, but the further fall to \$89 million in 2006-07 was due mainly to large downward revisions of prices for 'wild water' fishing.
- ❑ The large reduction in direct value added for recreational use from \$301 million in 2005-06 to \$61 million in 2006-07 is due to the revised definition of recreational activity, which for 2006-07 related to the GBRMP rather than the GBRCA. Culture activity, which is considered in 2004-05 and 2005-06 report, is not included in 2006-07 report.
- ❑ Total employment measures for direct tourism decreased from 27,000 FTEs in 2005-06 to 24,600 FTEs, due mainly to revisions in the conversion of persons to FTEs.
- ❑ For contributions to the GBRCA, indirect results for tourism employment have increased while the direct results have decreased. This is due to use of different ratios of FTE to persons for direct and indirect contributions, together with a greater increase in indirect than direct results generally as shown for tourism value added.
- ❑ Tourism results for Australia are larger than those for the GBRCA because of the additional expenditures for airfares. The revised methodology for 2006-07 allocates international airfares differently.

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<sup>8</sup> Please refer to Table D.1 in Attachment D for details.

**TABLE 7.4: COMPARISON OF DIRECT/INDIRECT ECONOMIC CONTRIBUTION OF GBRMP/GBRCA ACTIVITIES TO THE GBRCA, QUEENSLAND AND AUSTRALIA ACROSS REPORTS, 2004-05, 2005-06 AND 2006-07**

<i>Value Added</i>	<i>GBRCA 2004-05<sup>1</sup> (\$m)</i>	<i>GBRCA 2005-06<sup>1</sup> (\$m)</i>	<i>GBRCA 2006-07 (\$m)</i>	<i>Queensland 2004-05<sup>1</sup> (\$m)</i>	<i>Queensland 2005-06<sup>1</sup> (\$m)</i>	<i>Queensland 2006-07 (\$m)</i>	<i>Australia 2004-05<sup>1</sup> (\$m)</i>	<i>Australia 2005-06<sup>1</sup> (\$m)</i>	<i>Australia 2006-07 (\$m)</i>
<b><i>Direct contribution</i></b>									
Visitors from GBRCA	420	392	507	410	383	507	416	387	575
Visitors from rest of Queensland	324	311	375	386	347	420	396	356	461
Inter-state visitors	575	740	787	573	736	787	708	922	966
International visitors	589	628	589	672	677	600	55	926	680
GBRCA total tourism**	1,908	2,071	2,257	2,041	2,143	2,314	862	2,591	2,682
GBRMP commercial fishing	133	116	89	145	126	89	131	114	87
GBRMP recreational use	301*	301*	61	275*	274*	61	315*	314*	72
<b>Total contribution</b>	<b>2,342</b>	<b>2,488</b>	<b>2,408</b>	<b>2,461</b>	<b>2,543</b>	<b>2,465</b>	<b>1,308</b>	<b>3,019</b>	<b>2,841</b>
<b><i>Indirect contributions</i></b>									
Visitors from GBRCA	166	169	258	272	276	322	357	362	555
Visitors from rest of Queensland	136	131	178	256	236	254	328	303	414
Inter-state visitors	237	303	371	383	491	471	573	739	859
International visitors	238	251	281	422	424	361	666	707	607
GBRCA total tourism**	777	854	1,087	1,333	1,427	1,408	1,924	2,111	2,435
GBRMP commercial fishing	54	47	28	91	79	34	143	124	52
GBRMP recreational use	105*	105*	36	198*	198*	45	229*	229*	81
<b>Total contribution</b>	<b>936</b>	<b>1,006</b>	<b>1,150</b>	<b>1,622</b>	<b>1,704</b>	<b>1,487</b>	<b>2,296</b>	<b>2,464</b>	<b>2,567</b>

Source: Access Economics; Note: \* Culture activity is included in recreational use; \*\* Tourism contribution of GBRCA residents for travel outside GBRCA is not included; <sup>1</sup> Tourism economic contributions from the GBRCA residents from travel outside GBRCA are not included. Results for 2004-05 and 2005-06 are based on the previous methodology.

## EXPENDITURES

The changes in the estimated economic contribution of the GBRMP do not follow the trends exhibited by the underlying expenditure data. The most striking example of this is commercial fishing. Table 7.5 shows that the estimated expenditure on commercial fishing *rose* by \$10 million from 2005-06 to 2006-07. The economic contribution of commercial fishing to the GBRCA, however, actually fell by \$27 million as shown in Table 7.4.

This is a result of the methodological changes made between the 2005-06 and 2006-07, and implies that comparison of the figures produced in previous reports is problematic.

**TABLE 7.5: EXPENDITURES ON SELECTED GBRCA/GBRMP ACTIVITIES, 2004-05 TO 2006-07, \$MILLION (CURRENT VALUES)**

<i>GBRCA/GBRMP Activity</i>	<i>Expenditure 2004-05 \$m</i>	<i>Expenditure 2005-06 \$m</i>	<i>Expenditure 2006-07 \$m</i>	<i>% increase 2004-05 to 2005-06</i>	<i>% increase 2005-06 to 2006-07</i>
<i>Total tourism within the GBRCA</i>					
Domestic day visitors	512	677	793	32.2%	17.1%
Domestic overnight visitors	3,208	3,464	3,704	8.0%	6.9%
International visitors (excluding intrnl airfares)	1,281	1,353	1,366	5.6%	1.0%
<b>GBRCA total tourism</b>	<b>5,001</b>	<b>5,494</b>	<b>5,863</b>	<b>9.9%</b>	<b>6.7%</b>
GBRMP commercial fishing (gross value of prdn)	161	155	165	-3.7%	6.5%
GBRMP recreational fishing	155	166	177	7.2%	6.6%
GBRMP other recreational activity	91	98	105	7.2%	6.6%
<b>Total expenditure in GBRCA</b>	<b>5,408</b>	<b>5,913</b>	<b>6,309</b>	<b>9.3%</b>	<b>6.7%</b>
Queensland household consumption	95,246	102,150	108,904	7.2%	6.6%
Australian household consumption	521,028	547,458	581,873	5.1%	6.3%

Source: Access Economics (2008) using data from TRA and Queensland Fisheries. Totals may differ from sums of components due to rounding.

## RECONCILED ESTIMATES IN TIME SERIES

To overcome the difficulties of comparing results over time, a set of estimates are presented in Table 7.6 that are based, to the extent possible, on the methodology employed in this report. These estimates assume that the economic contribution is proportional to expenditures as given in Table 7.5.

The results show an overall increase in the estimated contribution of GBRMP to the GBRCA, Queensland and Australian economies over the three years as a result of mainly an increased contribution of tourism and recreational use.

The contribution of commercial fishing is relatively unchanged over the period.

**TABLE 7.6: COMPARISON OF DIRECT/INDIRECT VALUE ADDED CONTRIBUTIONS OF GBRMP/GBRCA ACTIVITIES TO THE GBRCA, QUEENSLAND AND AUSTRALIA, 2004-05, 2005-06 AND 2006-07**

<i>Value Added</i>	<i>GBRCA 2004-05 (\$m)</i>	<i>GBRCA 2005-06 (\$m)</i>	<i>GBRCA 2006-07 (\$m)</i>	<i>Queensland 2004-05 (\$m)</i>	<i>Queensland 2005-06 (\$m)</i>	<i>Queensland 2006-07 (\$m)</i>	<i>Australia 2004-05 (\$m)</i>	<i>Australia 2005-06 (\$m)</i>	<i>Australia 2006-07 (\$m)</i>
<b><i>Direct contribution</i></b>									
Visitors from GBRCA	327	433	507	327	433	507	371	491	575
Visitors from rest of Queensland	324	350	375	364	393	420	399	431	461
Interstate visitors	682	736	787	682	736	787	837	903	966
International visitors	552	583	589	563	594	600	638	674	680
GBRCA total tourism	1,885	2,102	2,257	1,936	2,156	2,314	2,245	2,499	2,682
GBRMP commercial fishing	87	84	89	87	84	89	85	82	87
GBRMP recreational use	53	57	61	53	57	61	63	67	72
<b>Total contribution</b>	<b>2,026</b>	<b>2,243</b>	<b>2,408</b>	<b>2,076</b>	<b>2,297</b>	<b>2,465</b>	<b>2,393</b>	<b>2,649</b>	<b>2,841</b>
<b><i>Indirect contributions</i></b>									
Visitors from GBRCA	166	220	258	208	275	322	358	474	555
Visitors from rest of Queensland	154	166	178	220	238	254	359	387	414
Interstate visitors	321	347	371	408	440	471	744	803	859
International visitors	263	278	281	338	358	361	569	601	607
GBRCA total tourism	905	1,011	1,087	1,174	1,310	1,408	2,030	2,265	2,435
GBRMP commercial fishing	27	26	28	33	32	34	50	48	52
GBRMP recreational use	31	33	36	39	42	45	71	76	81
<b>Total contribution</b>	<b>963</b>	<b>1,070</b>	<b>1,150</b>	<b>1,247</b>	<b>1,384</b>	<b>1,487</b>	<b>2,151</b>	<b>2,390</b>	<b>2,567</b>

Source: Access Economics; Note: Results for 2004-05 and 2005-06 reports use new methodology as applied in 2006-07 report.

## **7.3 QUALIFICATIONS TO RESULTS**

It must be emphasised that the economic contributions of tourism presented in this report are for the whole of the GBRCA, and not for the GBRMP alone. The commercial fishing and recreational activity contributions are essentially for the GBRMP, but the GBRMP contributions for tourism are expected to be much smaller than the GBRCA tourism contributions used in this report.

The TRA tourism data for the GBRCA comprise visits for a range of purposes. Some visits are for a mix of purposes. Visitors whose primary purpose is holiday/leisure visit various combinations of the GBRMP and many other GBRCA locations that are outside the GBRMP. Many visitors to the GBRCA do not visit the GBRMP. On the other hand, some visitors whose primary purpose for the visit is other than holiday/leisure may visit the GBRMP. Most day visits for shopping, which is classified by the TRA as holiday/leisure, are unlikely to include visits to the GBRMP.

The GBRMP must nevertheless be a significant factor in many decisions to visit the GBRCA. In the absence of better data on tourism to the GBRMP, it is convenient to use the GBRCA as indicators of contributions to the GBRMP. Percentage changes in GBRMP contributions are likely to approximate percentage changes in GBRCA contributions.

## **7.4 CAVEATS**

These estimates are subject to a variety of caveats, as noted throughout this report:

- ☐ They cover market-related transactions only: non-market activities, including cultural and indigenous activities, are not covered.
- ☐ The analysis relates to annual flows estimated for 2006-07 only.
- ☐ The quantification is based on a variety of data sources compiled by different Commonwealth and State agencies: there will inevitably be some inconsistencies.
- ☐ Some of the actual data, especially IO data, are relatively old and need to be 'scaled up' to obtain estimates for the reference year (2006-07). The scaling up process undertaken by Access Economics inevitably involves scope for additional errors.
- ☐ Externality effects have not been taken into account.
- ☐ On externality effects, the economic contributions of the three selected industries also do not cover adverse effects over time.

## **7.5 FUTURE WORK IMPLICATIONS**

### **7.5.1 TOURISM RESULTS FOR THE GBRMP RATHER THAN THE GBRCA**

The best way to enhance the accuracy of future reports is to establish, using firm data, which proportions of expenditures on visits to the GBRCA can be attributed to the GBRMP.

The GBRMPA EMC counts are a starting point, but measure only visitor days on vessels registered with the GBRMPA. They do not include trips on privately owned boats, non-boat use of the GBRMP, or additional days spent on islands, and provide no information about expenditure. Although time-consuming and potentially expensive, regular surveys of visitors to the GBRMP itself would be the best way to establish the proportion of GBRCA tourism expenditure that can be attributed to the Marine Park itself.

### 7.5.2 ADDITIONAL AREAS OF IMPROVEMENT

To more completely analyse the economic contribution of the GBRMP, the list of included activities could be extended beyond tourism, commercial fishing and recreational activities. There are several potential inclusions:

- ☐ GBRMPA management and DPI&F Fisheries monitoring of the GBRMP.
- ☐ Scientific research, which overlaps to some extent with Park management. A comprehensive summation of the annual gross costs involved, based on the Hand report (GBRMPA 2003), might be between \$100 and \$200 million per annum.
- ☐ Processing of the commercial fishing catch.

Improved recreational fishing data are expected in coming months, through DPI&F Fisheries' analysis of its recreational fishing survey data, and through some research on recreational fishing by Steve Sutton at James Cook University that is nearing publication. These data would be useful for future reports.

The analysis has been hampered by delays in the release of the three relevant IO tables. National IO data for 2001-02 are about as up to date as can be expected and are unlikely to be a major source of error. The Queensland IO table derived for the Productivity Commission is considered to be of lesser quality, especially because of difficulties in measuring interstate trade. The GBRCA IO table was derived from the Queensland IO table and regional GAP data for 2001-02, and is of lesser quality than the other IO tables, due to difficulties in estimating trade. More recent versions of these tables, as they become available, would enhance the accuracy of the report.

In the tourism analysis, there is scope to improve the mapping of TRA/TSA data into IO industries.

Any information in these areas would help to make the analysis in this report more comprehensive. Any or all of these improvements could be addressed as soon as data became available.

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## ATTACHMENT A: METHODOLOGY

The economic analysis in this report relies heavily on the Tourism Satellite Account (TSA) methodology, which is applied to tourism and recreational use. Results for commercial fishing are based on the conventional supply-side analysis typical of industry studies.

Tourism is not an identifiable supply industry in the national accounts. It is defined instead on the demand side as a combination of products that are purchased by tourists. The TSA methodology is a means for relating these demands, as measured by expenditure incurred by travellers, to proportions of outputs of conventionally defined supply industries, and in that way calculating economic contributions of tourism in terms of gross value added, gross product and employment.

### OVERVIEW OF THE TSA METHODOLOGY

Access Economics has had a long involvement in various panels and forums promoting the development of a TSA since 1992. Based on our long experience with the concept of a TSA, we judge that the approach adopted by the ABS is the most consistent and elegant approach of those currently proposed by various international agencies (WTO, OECD, WTTC).

The ABS Tourism Satellite Account 2005-06 (ABS 5249.0, 2007) calculates the direct effects of tourism in Australia using Tourism Research Australia (TRA) tourism survey data, but adjusted to be consistent with ABS national accounts and balance of payments data. The Bureau of Tourism Research calculated the indirect effects of tourism in Australia for 2001-02 (BTR 2004) and the TRA has produced corresponding results for years up to 2005-06 (TRA 2007d).

Direct contributions of tourism to value added, Gross Area Product (GAP), employment and exports for the GBRCA can be calculated using tourism shares of expenditure, and hence economic activity, in each industry in the GBRCA. In order to determine the indirect contributions, as well as the direct contributions for imports, it is necessary to create an input-output (IO) table for the GBRCA. Once created, the IO table can then be used to compute *both* the direct and indirect contributions. An important aspect of the IO table is that it takes account of inter-regional and interstate imports as well as international imports.

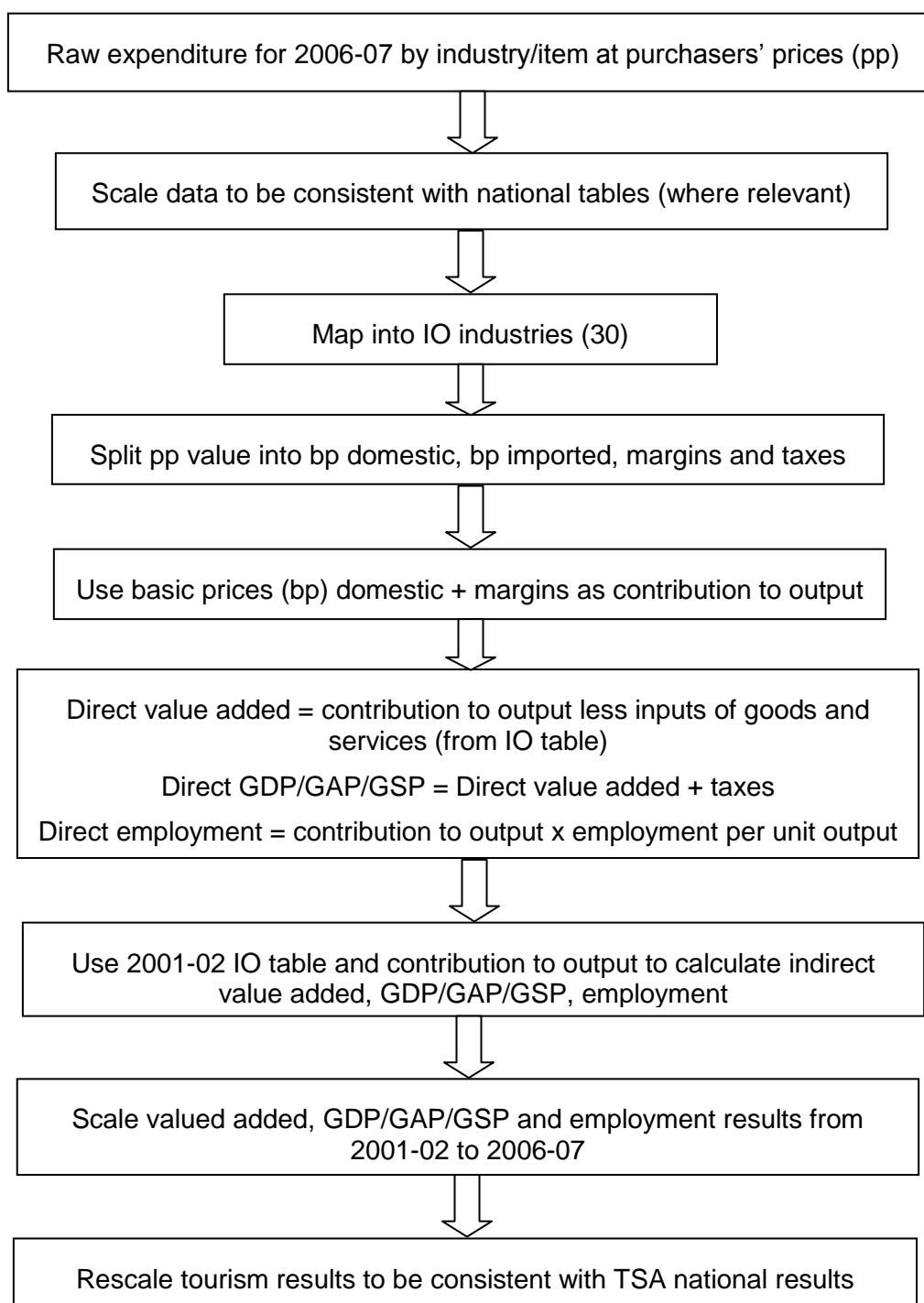
The process is summarised in the flow chart in Figure A.1. It can be repeated to calculate the contributions of tourism expenditures in the GBRCA to the Queensland and Australian economies by using IO tables for Queensland and Australia. The analysis depends on the distinction between values at purchasers' prices<sup>9</sup> (pp) and basic prices<sup>10</sup> (bp).

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<sup>9</sup> The purchasers' price (also known as market price) is the amount paid by the purchaser in order to take delivery of goods or services. It includes any taxes payable (less subsidies receivable) on production and imports, and any transport charges paid separately by the purchaser to take delivery of goods.

<sup>10</sup> The basic price is the amount receivable by the producer for the sale of a unit of a good or service. It excludes any taxes or subsidies associated with the sale, any transport charges invoiced separately by the producer, and any (wholesale and retail) trade margins on the resale of goods.

**FIGURE A.1: FLOW CHART FOR THE METHODOLOGY USED TO ESTIMATE ECONOMIC CONTRIBUTIONS**



# TOURISM DATA

## OVERVIEW OF TOURISM DATA

The initial step in the analysis is to determine results for visitors to the GBRCA for four visitor residence classifications – within GBRCA, the rest of Queensland, interstate, and international. This separation is important for calculating regional trade.

TRA tourism data for visitor nights (to June 2007), visitor numbers (to June 2007), and total expenditure (to June 2006) are available for regions as small as Local Government Areas, but we have used only more broadly-defined tourism regions.

In assembling the data, this report uses the TSA data wherever possible for Australia-wide tourism contributions, and the TRA data to estimate GBRCA shares thereof. Within the TRA data, the emphasis is on REM data for total expenditures by region. We then use CD-MOTA (2005-06) and TRA online database (2006-07) results to estimate the splits of total REM expenditures into total expenditures for residents of the GBRCA, residents of the rest of Queensland and residents of other states. Finally, total expenditures are allocated across expenditure items in proportion to CD-MOTA data.

## TSA DATA

The TSA presents tourism outputs, expenditures and employment nationally for 2005-06, classified to products according to ABS concepts of 'tourism characteristic' products and 'tourism connected' products, and similarly for industries. The TSA makes use of TRA data, but maps the data into supply-use classifications and scales the data to conform to national accounts totals and balance of payments aggregates. In particular, it adjusts the TRA survey data for airline fares paid by non-residents to foreign airlines, which are by definition not part of the Australian national accounts. The TSA allocates pre-paid package expenditure to accommodation, airfares and tours. The TSA contains an imputed value of rent for holiday houses, and includes expenditure on motor vehicles and other capital items.

TSA values for 2006-07 were not available when this report was written. The estimated scaling factors from TRA to TSA dollar values for Australia in 2005-06 are those given in Table A.1. TSA expenditures by item for 2006-07 were estimated by applying the 2005-06 scaling factors to detailed TRA data for 2006-07.

In the calculation of ratios for international visitors, expenditures on domestic goods and services were approximated by giving a weight of 0.5 to TRA prepaid airfares (as used by TRA, because TSA values tend to be around half of TRA values) and a weight of 0.3 to total pre-paid non-airfare package expenditure (as used by TRA in its REM calculations).

**TABLE A.1: TRA TO TSA TOURISM DATA SCALING FACTORS,  
BASED ON 2005-06 AUSTRALIAN EXPENDITURE ESTIMATES**

TRA Expenditure Item	Domestic		TRA Expenditure Item	International
	Day	Overnight		
Package	0.769	1.193	Package tour	1.000
Taxis	0.996	0.933	Organised tours	0.436
Airline fares	0.769	0.863	Domestic airfares	1.046
Organised tours	0.769	1.193	International airfares	1.046
Car hire costs	1.010	1.056	Rental vehicles	1.041
Fuel (petrol, diesel)	0.700	0.725	Petrol and oil costs	1.378
Vehicle maintenance or repairs	1.003	1.048	Taxi and local public transport	1.082
Other long distance transport costs	0.769	0.863	Long distance public transport	1.046
Other local transport costs	1.017	1.069	Food, drink & accom	1.259
Accommodation services	0.000	0.651	Accommodation	1.013
Takeaways and restaurant meals	1.004	1.302	Food and drink	1.259
Groceries etc for self-catering	1.666	1.647	Shopping to use in Aust	1.219
Alcohol, drinks (not already reported)	1.000	1.056	Shopping to take home	1.219
Shopping, gifts, souvenirs	1.000	1.159	Gambling	1.036
Entertainment, museums, movies	1.005	1.555	Entertainment	1.355
Horse racing, gambling, casinos	3.554	2.141	Motor vehicles	0.741
Conference fees	1.544	1.039	Education (trip_purpose = education)	1.263
Education, course fees	1.544	1.013	Education (trip_purpose not = education)	1.263
Purchase of motor vehicles	1.000	1.000	Phone, fax & postage	2.372
Other	1.033	1.039	Other expenditure	2.372
21 or more destinations	0.000	0.000	Actual and imputed rent on holiday houses	1.000
Actual and imputed rent on holiday houses	0.000	1.000		

Source: Access Economics.

Exceptions to this scaling methodology include;

- ❑ Purchases of motor vehicles by domestic overnight, domestic day and international visitors – expenditure estimates were calculated by applying the 2005-06 TSA purchases of motor vehicle expenses as a proportion of total 2005-06 TRA expenditure by tourists to Australia (excluding purchases of motor vehicles) to the equivalent 2006-07 TRA expenditure by tourists to GBRCA. The applied factors are:
  - 4.0% of total expenditure (excluding motor vehicle purchases) for day visitors;
  - 1.1% of total expenditure (excluding motor vehicle purchases) for overnight visitors; and
  - 1.7% of total expenditure (excluding motor vehicle purchases) for international visitors.
- ❑ Actual and imputed rent on holiday houses for domestic overnight and international visitors. The applied factors are:
  - 4.8% of total expenditure (excluding motor vehicle purchases) for domestic overnight visitors; and
  - 2.2% of total expenditure (excluding motor vehicle purchases) for international visitors.

TSA employment is measured in terms of persons employed, regardless of the hours worked. Tourism includes much part time employment. In this report Access Economics has used full time equivalents (FTE), calculated as the number of full time persons employed plus half the number of part time persons employed. The labour force data (ABS 6290.0, 2007) contain full time and part time employment by industry, which were used to calculate the ratio of FTEs to persons by industry. The weighted sum of the ratio of FTEs to persons was 0.808. This ratio was used to convert aggregate TSA employment in persons to aggregate FTEs for the purposes of comparing GBRCA direct tourism employment with national direct tourism employment.

## **TRA REGIONAL EXPENDITURE MODEL**

The expenditures provided in TRA's CD-MOTA are for entire trips and are thus unsuitable by themselves for allocating expenditures to regions, except for trips with a single destination. That is, a tourist may visit multiple destinations over a range of tourism regions; CD-MOTA includes the total trip expenditure in every region visited and thus significantly overestimates total expenditure by region.

The TRA's Regional Expenditure Model (REM) allocates total trip expenditures to regions visited using an iterative process that takes account of (single destination) information about daily and nightly expenditures in towns and cities visited and according to the purpose of the visit. Results for the most visited tourist destinations, together with corresponding values for numbers of visitors and visitor nights, are incorporated into TRA quarterly publications for domestic and international visitors (e.g., TRA 2007b, TRA 2007c).

TRA has used REM to calculate total expenditure in each region for day, domestic overnight and international visitors separately. Table A.2 summarises these expenditures in 2005-06 and 2006-07 for GBRCA regions together with numbers of visitors, visitor nights, expenditure per night, and nights per visit. REM identifies package expenditures by international visitors on domestic items (excluding international airfares). REM also provides separately the total expenditures by domestic visitors on airfares and other public long distance travel (LDT), including apportionment of the airfare component of package expenditure.

The TRA data underlying the REM analysis is based on annual TRA interviews of around 120,000 Australian residents and around 20,000 international visitors aged 15 years and over. These samples are then used to estimate entire population annual trips and expenditures to Australia and its regions. Table A.2 results represent these sample based population estimates.

Although the regional results for 2005-06 and 2006-07 are based on relatively small samples, there is a reasonable amount of consistency in the REM, CD-MOTA and TRA online figures across financial years.

The REM totals are provided as sums across all visitors, but without any separation of expenditures according to the region or state of residence. Our analysis requires separation of expenditures by domestic visitors according to place of residence (GBRCA, rest of Queensland, interstate) in order to estimate regional trade and also because they may have different expenditure profiles. Mapping of expenditures by day and domestic overnight visitors into expenditures by tourists from the GBRCA, rest of Queensland and interstate visitors depends on examination of expenditure item data contained in TRA online and CD-MOTA.

## **TRA ONLINE AND CD-MOTA**

Detailed tourism data for the GBRCA were assembled from TRA online and electronic CD-MOTA data separately for (domestic) day visitors, (domestic) overnight visitors and international visitors. We have used data for the June 2007 quarter, together with data from earlier quarters, to construct values for the year ending June 2007. From the wealth of sample information provided in TRA online, we make use of numbers of visitors, number of nights, expenditure across about 20 items, destinations visited, and state/region of residence. We also distinguish between visitors to a single destination and those who visit multiple destinations.

**TABLE A.2: TRA TOURISM DATA, BY TYPE OF VISITOR AND GBRCA TOURISM REGION, 2005-06 AND 2006-07**

	Bundaberg	Fitzroy	Mackay	Whitsundays	Northern	Tropical Far North	Total GBRCA
<b>Domestic Day Visitors</b>							
Number of visits ('000)							
2005-06	700	1,173	587	195	1,147	1,568	5,368
2006-07	670	1,650	839	425	1,107	1,650	6,340
REM expenditure (\$m)							
2005-06	\$85	\$182	\$79	\$32	\$121	\$178	\$677
2006-07	\$61	\$215	\$103	\$69	\$125	\$220	\$793
Expenditure per day (\$)							
2005-06	\$122	\$155	\$135	\$164	\$105	\$114	\$126
2006-07	\$91	\$130	\$123	\$162	\$113	\$133	\$125
<b>Domestic Overnight Visitors</b>							
Number of visits ('000)							
2005-06	535	1,036	630	537	857	1,471	4,518
2006-07	558	1,128	702	605	1,051	1,452	5,018
Visitor nights ('000)							
2005-06	1,952	3,532	2,506	3,623	3,217	7,304	22,134
2006-07	2,104	4,266	2,521	2,631	4,318	7,735	23,576
REM excl. Long distance travel (\$m)							
2005-06	\$182	\$446	\$220	\$573	\$358	\$1,128	\$2,907
2006-07	\$168	\$433	\$230	\$624	\$437	\$1,237	\$3,129
REM long distance travel (\$m)							
2005-06	\$18	\$56	\$60	\$103	\$102	\$218	\$557
2006-07	\$17	\$84	\$54	\$90	\$93	\$237	\$575
Nights per visit							
2005-06	3.6	3.4	4.0	6.7	3.8	5.0	4.9
2006-07	3.8	3.8	3.6	4.4	4.1	5.3	4.7
Expenditure per night (ex LDT) (\$)							
2005-06	\$93	\$126	\$88	\$158	\$111	\$154	\$131
2006-07	\$80	\$101	\$91	\$237	\$101	\$160	\$133
Expenditure per visit on LDT (\$)							
2005-06	\$34	\$54	\$95	\$192	\$119	\$148	\$123
2006-07	\$30	\$74	\$77	\$149	\$89	\$163	\$115
<b>International Visitors</b>							
Number of visits ('000)							
2005-06	51	94	46	218	140	868	986
2006-07	65	101	50	209	138	841	974
Visitor nights ('000)							
2005-06	381	735	201	1,216	1,077	6,511	10,122
2006-07	685	540	263	1,292	1,456	6,951	11,186
REM incl. package, excl. intl airfares (\$m)							
2005-06	\$11	\$32	\$14	\$121	\$64	\$1,111	\$1,353
2006-07	\$20	\$39	\$19	\$119	\$83	\$1,085	\$1,366
Nights per visit							
2005-06	7.5	7.8	4.4	5.6	7.7	7.5	10.3
2006-07	10.5	5.3	5.3	6.2	10.5	8.3	11.5
Expenditure per night (\$)							
2005-06	\$29	\$44	\$70	\$99	\$59	\$171	\$134
2006-07	\$30	\$73	\$73	\$92	\$57	\$156	\$122

Source: Unpublished TRA REM data, supplied by Tourism Queensland, and CD-MOTA online database.

Note: The shaded cells relate to total visits to the GBRCA that include some visits to multiple regions. Totals may differ from sums of components due to rounding. LDT refers to 'Long Distance Transport including airfares'.

Our analysis of the TRA data excludes expenditures on capital items and the purchase of motor vehicles. The TRA online and CD-MOTA data show that these expenditures fluctuate

greatly from year to year. We have doubts about the allocation of these costs between tourism and other purposes, and there is no allowance for sales of items after the trip.

A major difficulty with TRA online data is that expenditures are provided for complete trips only, without any separation into values for the various stopovers. This makes it impossible to determine expenditures – without estimation - in individual regions, except where there are single stopovers. We use CD-MOTA data for 2005-06 to overcome this problem.

We derive the required expenditures in two steps. Firstly, aggregate expenditures for day and domestic overnight visitors are mapped into aggregate expenditures for the GBRCA day, GBRCA overnight, rest of Queensland day, rest of Queensland overnight, interstate day and interstate overnight. Secondly, the aggregate expenditure for each visitor category, including international, is split into expenditures on individual items.

It cannot be assumed that overnight visitors from different parts of Australia, for example, have the same expenditure per item per night. Furthermore, visitors with single and multiple stopovers have different expenditure patterns. We make use of expenditure by item for single stopovers and multiple stopovers, and estimate GBRCA shares of multiple stopover expenditures.

## **AGGREGATE GBRCA EXPENDITURE BY PLACE OF RESIDENCE**

**Day visits** consist predominantly of single stopovers. The TRA-REM totals are allocated to visitors from GBRCA, the rest of Queensland and interstate in proportion to TRA online database visitor numbers (2006-07). This method assumes that every visitor, regardless of their origin, has an identical total spend.

For **domestic overnight visitors**, REM provides expenditure for airfares plus other long distance travel (LDT) separately from other items. Airfares and long distance travel account for around 16% of total overnight expenditure. While expenditures on most items can be expected to be proportional to the number of nights, travel expenditures directly relate to the number of trips. We treat travel separately from other items in making use of the REM data.

The separation of TRA-REM totals for domestic overnight visitors into total expenditures by visitors from GBRCA, the rest of Queensland and interstate is necessarily based primarily on single stopover CD-MOTA data, which was last available for 2005-06 (TRA 2006). Single stopover data are used to calculate costs per trip for airfares and other LDT<sup>11</sup>, and costs per night for all other expenditure items. These results are then scaled up to all visits by multiplying by the numbers of visits in the case of LDT (meaning airfares and other LDT), and by number of nights for all other items. The LDT results for GBRCA, rest of Queensland and interstate are then pro-rated so that their sum equals the TRA-REM value for LDT. The sums for the other items are pro-rated similarly to agree with the TRA-REM values for other items. Totals for these results are presented in Table A.3 below.

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<sup>11</sup> Only half of the airfare and long distance costs are allocated to the GBRCA for visits by non-GBRCA residents. The remaining half is allocated to the region of origin. This essentially assumes that all overnight visits are single stopover visits. For rest of Queensland (interstate) residents, single stopover visits account for 82% (66%) of visits from the rest of Queensland (interstate).

**TABLE A.3: ESTIMATION OF TOTAL TRA EXPENDITURES FOR DAY AND DOMESTIC OVERNIGHT VISITORS TO THE GBRCA BY PLACE OF ORIGIN, 2006-07**

2006-07	GBRCA	Rest of Qld	Interstate	Total
<b>Day visitors to GBRCA</b>				
Number of visitors ('000)	5,521	724	95	6,340
CD-MOTA expenditure (\$m)	<i>Not available by destination region</i>			
Estimated expenditure (\$m)	\$647	\$126	\$20	\$793
<b>Domestic overnight visitors to GBRCA</b>				
Number of visitors ('000)	2,279	1,506	1,233	5,018
Number of nights ('000)	6,776	6,462	10,338	23,576
Share of 1 stopover nights (%)	80%	77%	52%	67%
CD-MOTA \$/visit airfares & LDT, 1 stop	\$16	\$95	\$379	\$111
CD-MOTA \$/night other, 1 stop	\$123	\$121	\$211	\$152
Estimated airfares& LDT (\$m) total	\$35	\$133	\$407	\$575
Estimated other expend (\$m) total	\$794	\$740	\$1,595	\$3,129
Estimated total expend (\$m)	\$829	\$874	\$2,001	\$3,704

Source: Access Economics, based on TRA REM and TRA CD-MOTA and online database. Totals may differ from sums of components due to rounding. Results are raw estimates, not yet adjusted for TSA consistency.

Given the total of the single stopover expenditures and the REM total expenditure for visitors to GBRCA, by subtraction the remaining expenditure is that of multiple stopover visitors. For expenditure items excluding airfares, a constant spend per night is then assumed across all places of origin and applied to their respective numbers of multiple stopover visitors. The total for these expenditure items by place of origin is then the sum of the single stopover and multiple stopover results.

This process is not suitable for estimating multiple stopovers airfares and other LDT by region of origin, as it is reasonable to expect that these costs would be significantly more for interstate visitors than for visitors from within the GBRCA. A similar approach (to that for other expenditure items) was taken in terms of extracting the total airfare and other LDT spend for all visitors to the GBRCA from our single stopover estimate and the REM total expenditure. However, for airfares and other LDT, the calculations use expenditure per visit rather than expenditure per night. Using this amount we then applied a factor to the expenditure per visit by single stopover visitors by place of origin such that the sum of the individual regions expenditure on airfares and other LDT reconciles with the total expenditure for all visitors. Again, the total expenditure on airfares and other LDT by region of origin is the sum of single stopover and multiple stopover estimates.

The use of single stopover results to estimate expenditures for all visits is obviously an approximation and a likely source of error. However, given the relatively large proportion of single stopover nights (see Table A.3), the error may not be large. Because the proportion of single stopover visits is lowest for interstate visitors and highest for GBRCA residents, and multiple stopover visitors are likely to have lower costs per night (especially for those camping or in caravans), it is recognised that applying single stopover results to all stopovers may overestimate expenditure shares for interstate visitors.

## EXPENDITURE BY ITEM

For **day visitors**, we simply apply weightings to the total expenditure amounts for each of the visitors from the GBRCA, rest of Queensland and interstate.

For **domestic overnight visitors**, our methodology item is to first determine expenditures by item for single stopovers and multiple stopovers for visitors from the CGRCA, the rest of Queensland and interstate, knowing that the multiple stopover results are unreliable because of multiple counting. For all other items, expenditure equals the CD-MOTA single stopover result plus a fixed proportion of the CD-MOTA multiple stopover result. The fixed proportions

are derived by assuming that total multiple stopover expenditure, equal to REM expenditure less single stopover expenditure, is spread across visitors from GBRCA, rest of Queensland and interstate in proportion to visitor nights.

Since expenditure by item is provided only up to the quarter ending June 2006, the estimation process for all other expenditure items is as follows:

- ❑ Estimation for itemised expenditure for single stopovers by origin, 2006-07;
  - Extract 2005-06 itemised expenditure per night for residents of each region of origin, and for Australia as a whole from raw CD-MOTA data.
  - Extract 2006-07 itemised expenditure per night for all domestic visitors from TRA online database.
  - Scale the 2005-06 region of origin data by the growth factor (1.026) in total expenditure per night for all domestic visitors between 2005-06 and 2006-07. This provides an estimate of the 2006-07 itemised expenditure by place of origin.
- ❑ Estimation for itemised expenditure for multiple stopovers by origin, 2006-07;
  - Start with the single stopover itemised expenditure for rest of Queensland visitors *for all* regions of origin. Adjustments are then made to accommodation and meal costs, shopping, and package tours expenditure.
- ❑ Sum the 2006-07 single stopover and multiple stopover itemised expenditures by origin.

**International visitors** tend to have far more stopovers than Australians on domestic overnight trips. Indeed, only 19% of international visitor nights within the GBRCA are accounted for by single stopovers. However, the most up-to-date and reliable itemised expenditure array by region available is the single stopover cash flows for 2005-06. Thus, the approach adopted for calculating international visitor expenditure is as follows;

- ❑ Determine the difference in itemised expenditure per night between single stopover visitors to Australia in 2005-06 and single stopover visitors to the GBRCA in 2005-06.
  - The vectors were observed to vary significantly, particularly in terms of organised tour (GBRCA 15.1% *more* weighting), shopping to take home (GBRCA 17.0% *more* weighting), and education (GBRCA 18.1% *less* weighting).
- ❑ Assume that the difference in itemised expenditure shares between *single* stopover visitors to the GBRCA in 2005-06 and *single* stopover visitors to Australia in 2005-06 accounts for 75% of the differences in expenditure shares between expenditure in the GBRCA for *all stopovers* 2006-07 and itemised expenditure shares for Australia for *all stopover* itemised expenditure shares for 2006-07.
- ❑ Therefore, the estimated itemised expenditure weightings for the GBRCA for all stopovers in 2006-07 is equal to the Australian itemised expenditure weightings for all stopovers in 2006-07 plus 75% of the single stopover difference vector.
- ❑ The expenditure weightings are then applied to the REM total (excluding packages).
- ❑ Add single stopover and multiple stopover expenditures.

On top of these expenditures, the domestic components of pre-paid package tour costs borne by international visitors are extracted from REM data (i.e. it is the difference between regional expenditure including package expenditure and excluding package expenditure, where both exclude international airfares) and allocated to accommodation and meals.

## PURPOSE OF VISIT

It is to be expected that tourism visits to the GBRMP, as opposed to the GBRCA, are almost exclusively for the purposes of holiday and leisure, although there will be some for scientific

research, monitoring of conditions and investigation of business possibilities. Within the GBRCA, visits for holiday and leisure account for 67% of international visitor nights, compared with 37% for all international visits to Australia. The proportions are even higher for Tropical North Queensland (74%) and the Whitsundays (74%). For day visitors, the GBRCA proportion of holiday/leisure visits, which includes shopping, is 53% which is similar to 51% for Australia as a whole. For domestic overnight visitors, the GBRCA share of visitor nights is 52%, although the proportions for Tropical North Queensland (68%) and the Whitsundays (74%) are significantly higher.

## **DOMESTIC AIRFARES AND LONG DISTANCE TRAVEL COSTS**

The allocation of domestic airfares and other LDT costs between the GBRCA and other regions is more complicated than for other expenditure. The general principle is that domestic airfares are shared equally between the GBRCA and the region of residence for single destination trips, but a smaller proportion is allocated to the GBRCA for multiple destination trips. However, some of these travel costs are put back into the calculations when estimating the contributions of GBRCA tourism to Queensland and Australia.

For single destination trips by Australians, contributions for Australia include all airfares associated with visits from interstate, the rest of Queensland and the GBRCA. Contributions for Queensland include all airfares associated with visits from the GBRCA and the rest of Queensland, and 50% of those associated with visits from interstate. Contributions for the GBRCA include all airfares associated with visits within the GBRCA and 50% of airfares associated with visits from the rest of Australia. The equal allocation of air fares to origin and destination regions follows TRA REM procedures.

For multiple destination visits by Australians is a matter of deciding which proportion of the airfares outside the GBRCA should be attributed to the GBRCA visit. Inspection of the stopover data indicates that many of the additional stopovers associated with visits to the GBRCA are within the GBRCA, and that the visit to the GBRCA is often the main event.

However, these considerations were bypassed by using an alternative approach. Total expenditure on airfares and other LDT by multiple stopover visitors is equal to REM expenditure on airfares and other LDT less the estimated expenditure on airfares and other LDT by single stopover visitors. This was then allocated across visitors from the GBRCA, the rest of Queensland and interstate in proportion to the TRA online number of visits for multiple stopover visitors and \$/visit on airfares and other long distance costs for single stopover visitors.

## **INTERNATIONAL AIRFARES**

Most international visits involve visits to multiple destinations which should all be given weightings in the attribution of airfare expenditure, unless it can be demonstrated that one stopover was of much greater importance than all the others. Of course, in the case of single stopover visits, all expenditure is allocated to the GBRCA, except for some leakage to transits. In all other cases, only a proportion of international airfares should be attributed to GBRCA visits, even if arrival or departure is through a GBRCA airport.

In the absence of information about the importance/priority of visits to the GBRCA compared with visits to other parts of Australia, we have made the following simplifying assumptions, based on city of arrival and departure:

- ❑ All airfares are attributed to the GBRCA for visitors who include the GBRCA in their itinerary and arrive and depart from airports within the GBRCA;

- ❑ One half of airfares are attributed to the GBRCA for visitors who include the GBRCA in their itinerary and arrive or depart from an airport within the GBRCA, while the other leg (either arrival or departure) is from an airport outside the GBRCA; and
- ❑ One third of airfares are attributed to the GBRCA for visitors who include the GBRCA in their itinerary and arrive and depart from airports outside the GBRCA.

Proportions of the total value allocated to visits to the GBRCA that contribute to Queensland and the GBRCA are calculated in a similar manner, that is, on the basis of the cities of arrival and departure.

CD-MOTA data show that in 2005-06 (2006-07 data are unavailable) single stopovers accounted for 8% of international airfares for those who visited the GBRCA. Based on numbers of visits and only counting visitors who stopped over at least once in the GBRCA, international arrivals and departures through GBRCA airports accounted for 30% of international movements for all visits, while the corresponding figure for Queensland airports (including GBRCA airports) was 49%.

**7.6 APPLYING THESE PROPORTIONS TO THE AUSTRALIAN AIRFARES FIGURE (FROM REM RESULTS) FOR ALL VISITORS (REGARDLESS OF STOPOVER REGION) AND ASSUMING EQUAL AIRFARES PER VISIT, THIS CORRESPONDS TO MULTIPLICATION FACTORS OF 0.0572 FOR THE GBRCA, 0.0708 FOR QUEENSLAND, AND 0.0937 FOR AUSTRALIA.**

## **8. OTHER DATA ISSUES WITH STATE AND REGIONAL RESULTS**

There are some difficulties in moving from national results to regional and State results – for example, the head office and maintenance base of Qantas is in Sydney, while Virgin Blue is based in Brisbane. Hence NSW and Queensland would be expected to have more-than-proportional employment in the aviation industry.

In most cases tourism-related jobs tend to be where the tourists are, particularly for very localised activities like hotels, restaurants and taxis. For these jobs the economic contribution and jobs effects closely follow the data on expenditure. However, some of the larger tourism enterprises will tend to have employment and economic impacts that diverge more from the point where the expenditure is made.

### **TSA-CONSISTENT TOURISM EXPENDITURE BY INDUSTRY**

While the TRA online and CD-MOTA data contain great detail, the expenditure data are not consistent with national accounts. The ABS publishes national expenditure on tourism in the TSA. The latest data are for 2005-06 (ABS 5249.0, 2007). The major difference between TRA and TSA is that TRA measures of total airfares are approximately twice the TSA measures which are restricted to airfares with Australian-owned companies. Another difference is that TSA includes actual and imputed rent on holiday houses. Ratios of 2005-06 TSA expenditures to 2005-06 CD-MOTA expenditures, for individual expenditure items, (see Table A.1) were applied to TRA data for the year ending June 2007. It was assumed that the same ratios applied throughout Australia.

This required establishing mappings between TSA, NVS and IVS expenditure items, because they use different expenditure classifications to some extent.

The scaling of CD-MOTA expenditures by item to be consistent with the TSA data was done separately for day, domestic overnight and international visitors. This process generated tourism expenditures expressed in TRA expenditure categories at purchasers' prices. Corresponding day and domestic overnight expenditures, such as for tourism expenditures by GBRCA residents within the GBRCA, were added together.

The data were then mapped into the 30 industries used in the IO tables (see below). The mapping from TRA/TSA categories into IO industries was based partly on a similar exercise by the Bureau of Tourism Research for 1997-98 (Table 3 of Salma, 2001).

In order to analyse the economic effects on industries within GBRCA, Queensland and Australia, it is necessary to split values of tourism consumption at purchasers' prices into domestic supplies at basic prices, imports at basic prices, commodity taxes and margins for components of wholesale & retail trade and transport. The TSA for 2005-06 contains the corresponding 2003-04 splits (ABS 5249.0, 2007, Table 8). There is no corresponding table for 2005-06. We use the data for 2003-04 together with additional information from national IO tables to split the margins into their components. The margins are added back into the appropriate domestic trade and transport industries.

### **RECREATIONAL USE OF THE GBRMP**

TRA defines overnight travel as involving a stay away from home for at least one night, at a place at least 40 kilometres from home. Day visitor travel requires a round trip distance of at least 50 kilometres and being away from home for at least four hours. It excludes travel as

parts of an overnight trip and commuting between work/school and home. For activities such as recreational fishing that could be either a tourist activity or a recreational activity, it was assumed that the tourism components were already included in the TRA tourism data. Then, in analysing the recreational data, the share of expenditure attributable to tourism (on the basis of distance travelled from home) was subtracted from the recreational data so as to avoid double counting.

The approach adopted in this report is to use the expenditure by local residents on recreational activities. Thus recreational fishing is measured by the expenditure on items such as boats (including hire and charter), petrol, and fishing gear. Similarly, other recreation is measured by expenditure on tours, boats (including hire and charter), petrol, swimwear, and snorkelling and diving equipment. There are no recreational fishing licence fees for ocean fishing in Queensland. Power boat registration fees (of the order of \$100 per annum, depending on boat length) and boat trailer fees are paid to the Department of Transport. For about 70,000 registered vessels (see Figure 6.1), registration fees amount to around \$7 million, but these have not been allowed for in the analysis.

The contribution of recreational activity within the GRBMP was calculated in two parts, for recreational fishing and for all other recreational activities. DPI&F Fisheries provided Access Economics with some preliminary recreational fishing data for 2005 prior to processing. These were scaled to 2006-07 using Queensland total household expenditure.

## SUMMARY OF EXPENDITURES

Table A.4 summarises total expenditures in 2006-07, measured at purchasers' prices, which are associated with tourism, commercial fishing and recreational activities in the GBRCA. The expenditures have been scaled to be consistent with TSA data, and are presented for the GBRCA, Queensland and Australia. Results for tourism are split into separate contributions by international visitors, domestic visitors from the GBRCA, rest of Queensland, and interstate.

Results for each item are converted from the CD-MOTA estimated values to TSA values by multiplication by the ratio of the total TSA value for Australia to the total CD-MOTA value for Australia (as per the factors in Table A.4). The methodology provides approximate results only for 2006-07, because of the use of scaling factors for 2005-06 and the extensive use of 2005-06 single stopover data to derive expenditure by item for all stopovers.

**TABLE A.4: TSA-CONSISTENT TOTAL EXPENDITURES (PURCHASERS' PRICES) FOR GBRCA, QUEENSLAND AND AUSTRALIA THAT ARE ASSOCIATED WITH TOURISM, COMMERCIAL FISHING AND RECREATIONAL USE IN THE GBRCA**

	<i>2006-07</i>	<i>2006-07</i>	<i>2006-07</i>
	<i>GBRCA</i>	<i>Queensland</i>	<i>Australia</i>
Visitors from GBRCA	1,623	1,623	1,623
Visitors from rest of Qld	1,082	1,213	1,213
Interstate visitors	2,183	2,183	2,478
International visitors	1,759	1,824	1,935
<b>GBRCA total tourism</b>	<b>6,646</b>	<b>6,843</b>	<b>7,250</b>
GBRMP commercial fishing	165	165	165
GBRMP recreational fishing	178	178	178
GBRMP other recreational activity	105	105	105

Source: Access Economics. Totals may differ from sums of components due to rounding.

Table A.4 shows estimated expenditures in 2006-07 for the GBRCA, measured at basic prices and classified by input-output industry, for the same activities. The expenditures have been scaled to be consistent with TSA data.

## INPUT-OUTPUT TABLES

The economic analysis is driven by access to input-output (IO) tables that describe the economies of the GBRCA, Queensland and Australia.

We have used industry by industry IO tables for Australia and Queensland for 2001-02, and generated regional IO tables from associated gross regional product data by industry. The data were supplied by the Productivity Commission (2006) as part of the MMRF-NRA (Monash Multi-Regional Forecasting – National Reform Agenda) model and are based on Australia-wide ABS IO tables (ABS 5209.0, 2006). Our IO tables are aggregations from 58 industries to 30 industries where the selection of industries is guided by the level of industry detail in the Productivity Commission data, the level of detail in the TRA and TSA data, and the desired level of industry data for the GBRCA analysis. Tourism expenditure is dominated by passenger transport (especially air and road), accommodation, meals, food and drink, petrol and shopping, and we use separate industries for each of these as far as possible.

**TABLE A.5: GBRCA EXPENDITURES BY INDUSTRY (BASIC PRICES) THAT ARE ASSOCIATED WITH TOURISM, COMMERCIAL FISHING AND RECREATIONAL USE IN THE GBRCA, \$ MILLION, 2006-07**

Industry \$ million	Visitors from GBRCA to GBRCA	Visitors from Rest of Qld to GBRCA	Visitors from Interstate to GBRCA	International Visitors to GBRCA	Total Visitors to GBRCA	Commercial fishing in GBRMP	Recreational fishing in GBRMP	Other recreation in GBRMP
Agriculture, forestry and fishing	\$20	\$9	\$16	\$16	\$60	\$165	\$1	\$0
Mining	\$1	\$0	\$0	\$7	\$8	\$0	\$0	\$0
Food and beverages	\$87	\$46	\$81	\$58	\$272	\$0	\$3	\$3
Textiles, clothing and footwear	\$17	\$6	\$7	\$14	\$44	\$0	\$0	\$1
Wood and paper manufacturing	\$31	\$11	\$14	\$27	\$82	\$0	\$1	\$0
Petroleum products	\$50	\$23	\$26	\$7	\$105	\$0	\$3	\$3
Chemicals, rubber and plastic	\$21	\$8	\$10	\$19	\$57	\$0	\$1	\$1
Other non-metallic products	\$1	\$0	\$0	\$0	\$1	\$0	\$0	\$0
Metals, metal products	\$5	\$2	\$2	\$4	\$13	\$0	\$1	\$1
Transport equipment	\$8	\$3	\$5	\$4	\$20	\$0	\$18	\$9
Other equipment	\$7	\$3	\$3	\$6	\$19	\$0	\$3	\$2
Other manufacturing	\$11	\$4	\$5	\$10	\$30	\$0	\$5	\$0
Utilities	\$0	\$0	\$0	\$6	\$6	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Wholesale trade	\$83	\$34	\$47	\$58	\$220	\$0	\$22	\$12
Retail trade	\$178	\$82	\$133	\$234	\$627	\$0	\$17	\$9
Mechanical repairs	\$16	\$6	\$7	\$1	\$30	\$0	\$8	\$4
Accommodation, cafes and restaurants	\$266	\$202	\$466	\$277	\$1,211	\$0	\$2	\$2
Land passenger transport	\$28	\$13	\$33	\$25	\$99	\$0	\$0	\$0
Air passenger transport	\$54	\$157	\$460	\$137	\$809	\$0	\$0	\$0
Freight	\$24	\$11	\$16	\$15	\$66	\$0	\$3	\$2
Transport services	\$3	\$5	\$18	\$65	\$91	\$0	\$2	\$5
Communication services	\$13	\$7	\$7	\$11	\$37	\$0	\$0	\$0
Finance services	\$4	\$2	\$2	\$0	\$9	\$0	\$2	\$1
Property and business services	\$10	\$21	\$55	\$26	\$112	\$0	\$0	\$1
Ownership of dwellings	\$36	\$38	\$88	\$34	\$197	\$0	\$0	\$0
Government administration	\$2	\$1	\$1	\$12	\$17	\$0	\$4	\$3
Education	\$3	\$6	\$6	\$31	\$46	\$0	\$0	\$0
Health	\$20	\$10	\$12	\$22	\$64	\$0	\$0	\$0
Other services	\$37	\$54	\$102	\$32	\$226	\$0	\$0	\$0
<b>Total GBRCA</b>	<b>\$1,038</b>	<b>\$763</b>	<b>\$1,621</b>	<b>\$1,159</b>	<b>\$4,580</b>	<b>\$165</b>	<b>\$97</b>	<b>\$58</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

The Queensland IO tables are less reliable than the IO table for Australia because they are not based on Queensland survey data but are constructed using state totals for production and consumption (by industry) together with the national IO tables. In addition, perhaps the largest uncertainties are in the interstate trade flows (interstate exports and imports). The corresponding inter-regional trade flows are an even greater problem for the regional IO tables where it was necessary to estimate for each industry the proportion of inputs from Queensland that were supplied from within the region itself.

We have not used the employment data supplied with the Productivity Commission's Queensland and Australian IO tables because employment in each industry was calculated

as total wages divided by the average wage, where the average was over all industries. This generated spurious employment in industries where average wages were above or below the average. We used instead ABS Labour Force data for Queensland and Australia for the 17 major ANZSIC industries (ABS 6290.0, 2007) and mapped these into the 30 Access Economics industries.

We create industry-by-industry IO tables with direct allocation of imports. The use of an industry-by-industry table means that there is a 1-to-1 correspondence between industry production (or supply) and industry sales or demand. This generates a table that is square, which is essential for the matrix inversion used in the calculation of indirect contributions.

Only GBRCA-produced supplies of goods and services should be included in the GBRCA calculation, only Queensland produced supplies should be used in the Queensland calculation, and only Australian-produced supplies should be included in the national calculation. Consider the sale of an imported toy koala made in China. The production of this toy koala does not contribute to Australia's GDP, although the margins associated with its distribution and sale within Australia do contribute to Australia's GDP. For this reason it is appropriate to use an IO table with 'direct allocation of imports', i.e., in which imports are directly allocated to the sectors in which they are used, *but as a separate line item*. Each column of the intermediate usage part of the IO table represents an industry and describes the economic inputs into that industry. In the 'direct allocation of imports' treatment, each cell in a column contains only the domestically-produced inputs into the industry, while total imported inputs into that industry are contained in a single cell at the bottom of the column, just above the line for GBRCA, Queensland or Australian production. In the more usual 'indirect allocation of imports' IO table, each cell is the sum of the corresponding domestic and imported inputs. Value added, taxes and Australian production have the same values in both tables, but the industry inputs are presented differently. This results in different IO coefficient matrices ( $A$ ) and thus different inverse matrices  $(I-A)^{-1}$  that are used to form the derived coefficients for calculating the indirect effects.

## **USING A 2001-02 INPUT-OUTPUT TABLE FOR A 2006-07 APPLICATION**

The use of 2001-02 IO tables does not take account of changes in the patterns of consumption of products or output by industries from 2001-02 to 2006-07, as measured by State Accounts (ABS 5220.0, 2007). The activities of tourism industries are represented adequately by the 2006-07 tourism demands generated from TSA and TRA data. It is changes over time in the ratios of value added and employment to output, and in the interactions between sectors, that are the largest sources of uncertainty.

The cost structures of IO tables do not change appreciably over five or ten years, so that the coefficients derived from 2001-02 IO tables, such as value added per \$1 million of output, for each industry, can be assumed to be approximately constant over such time scales.

## **CALCULATION OF DIRECT ECONOMIC CONTRIBUTIONS OF TOURISM**

Demands for (tourism) goods and services are satisfied by a combination of domestic and imported supplies of the corresponding goods and services, where the domestic trade and transport margins associated with imports are domestic supplies.

Each industry column of the IO table provides the direct value added and direct employment per unit output (i.e., gross value of production) for that industry. Application of the tourism vector of domestic production to these coefficients thus gives tourism direct value added and tourism direct employment. This process is applied to the GBRCA, Queensland and Australian IO tables. The vectors of production used in the three cases are much the same

except that expenditure on airfares is larger for Queensland than for the GBRCA, and larger again for Australia.

The value added coefficients, which are ratios of value added to value of production, are calculated for 2001-02, and we assume that they are the same in 2006-07.

The ratio of employment to production tends to decline over time because (i) employment is a real quantity whereas production is a value that generally increases as prices increase over time, and (ii) labour productivity tends to increase over time. For the employment contributions we have scaled the ratios of employment to production (by industry) from 2001-02 to 2006-07, using employment by industry for Australia and Queensland (ABS 6290.0, 2007), and using (ratios of) factor income (that is, wages plus GOS) as proxies for (ratios of) production (ABS State Accounts 2006-07). For each industry, the employment coefficient, or ratio of employment (FTE) to production, for 2006-07 is calculated according to

$$\text{employment coefficient '06-07} = \text{employment coefficient '01-02} \times \\ (\text{FTE '06-07/FTE '01-02}) / (\text{output '06-07/output '01-02})$$

where it is assumed that output is proportional to factor income. The increases in FTE were derived from the average annual increases in employment by industry in Australia, Queensland and Queensland regions over the period August 2001 to May 2007 (ABS 6291.0, 2007). The increases in value added were derived from average annual increases in factor income by industry for Australian and Queensland over the period 2001-02 to 2006-07 (ABS 5204.0, November 2007).

Direct tourism value added for each industry was calculated as the sum of the direct tourism contributions associated with wages, gross operating surplus (GOS) and net taxes on production. Direct tourism GDP/GSP/GAP was then calculated as tourism value added plus taxes on products sold directly to tourists, but not including the net product taxes on inputs into production. Taxes for Australia, by product, were allocated across regions and types of visitor in proportion to expenditures.

## **CALCULATION OF INDIRECT ECONOMIC CONTRIBUTIONS OF TOURISM**

When a tourist buys (say) a meal in a restaurant, the direct economic impact is only the value added *directly* at the restaurant. This would include the wages of staff and the gross operating surplus of the restaurant. For example, if the meal purchased by the tourist cost \$40 and the raw inputs purchased by the restaurant were \$16, only the \$24 value added by the restaurant is included.

If the restaurant used raw ingredients that mostly came from GBRCA abattoirs, fisheries and wholesalers, then much of the \$16 cost of the raw materials in the above example is a further, albeit indirect, contribution made via expenditure by the tourist to the GBRCA economy.

However, if some of the inputs were imported from another region, state, or from overseas, the indirect impact on GBRCA region output and employment would be less.

To measure indirect value added requires the tourism expenditure on each item to be traced to each input used in its production, and the inputs used to create these inputs, and so on. The mathematical technique used to sum this chain of inputs requires the inversion of a matrix of coefficients derived from the GBRCA IO table that summarises the relationships between different GBRCA industries.

Indirect contributions for Queensland and Australia, for visitors to the GBRCA, are calculated in a similar way using IO tables for Queensland and Australia, respectively. The economic contributions are finally scaled by factors which make the Access Economics total indirect results for Australia consistent with the TRA total indirect results for Australia, adjusted from 2005-06 to 2006-07.

## TECHNICAL DESCRIPTION OF INDIRECT CALCULATIONS

It can be shown (ABS 5246.0, 1996) that the total value added, including both first round and flow-on effects, that is generated by a column vector of domestic demands at basic prices  $d$  is  $v.(I-A)^{-1}.d$ , where  $v$  is a row vector of value added shares in production. The same result applies for a vector  $d$  of domestic production.

The corresponding employment result is  $e.(I-A)^{-1}.d$  where  $e$  is a row vector of employment per unit production.  $A$  is a square matrix where the values in each column are the shares of intermediate inputs in total production for that industry. In this case,  $d$  is the vector of domestically-supplied intermediate inputs used in tourism production. The formulae describe the total effects of the demands including both the first round (or direct) contributions from the supplying industries and the flow-on (or indirect) contributions from industries further along the supply chain.

The industry composition of the value added indirect contributions is given by the sum over columns  $j$  of  $v_i.(I-A)^{-1}_{ij}.d_j$  where  $i$  denotes the row industry and  $j$  the column industry. The corresponding result for employment is obtained by using  $e$  in place of  $v$ .

The value added shares ( $v$ ) and employment shares ( $e$ ) are the same as for the direct contributions calculations.

We calculate indirect GDP, GSP and GAP as indirect value added plus both the direct and indirect net product taxes (commodity taxes less subsidies) on production. The direct net product taxes have been included because they were not included in direct tourism GDP, GSP and GAP. The ABS includes total indirect taxes on production when calculating GDP, but omits them when calculating contributions from individual industries. We believe that direct net product taxes should be included in direct tourism GDP, GSP and GAP. However, we have followed the TSA in omitting them from the direct results; hence we include them in the indirect results.

## INDIRECT TOURISM ECONOMIC CONTRIBUTION IS UNDERSTATED

There is another *indirect* contribution of tourism to the GBRCA. This is the demand for GBRCA production of goods and services that are used as inputs into non-GBRCA businesses directly supplying goods and services to tourism *outside* the GBRCA.

GBRCA tourism value added will be underestimated by the amount associated with production in the GBRCA of goods and services sold directly to tourists outside the GBRCA in Queensland, in other States, or overseas, or used directly or indirectly in the production of tourism goods outside the GBRCA in Queensland, in other States, or overseas.

All State- and region-specific studies undertaken along the lines of this report would underestimate region and state tourism value added, and the sum across all Australian regions or states would be less than Australian tourism value added as a result.

## **SCALING RESULTS TO BE CONSISTENT WITH TSA AND NATIONAL ACCOUNTS**

The analysis has used TRA data for 2006-07 but the most recent TSA data, which are consistent with National Accounts, are for 2005-06. Tourism expenditures were scaled, by industry and visitor origin, by the ratios of TSA expenditure in 2005-06 to TRA expenditure for Australia in 2005-06. It was assumed that the same scaling factors were appropriate for 2006-07. Even with such scaling, we found that total direct value added, taxes (used to derive GDP from value added) and employment for 2005-06 had to be scaled again to be consistent with corresponding TSA totals for 2005-06 (ABS 5249.0, 2007). The differences are attributed to our mapping of TSA expenditure categories into IO commodities and our use of 2001-02 IO tables for ratios such as value added to production, whereas TSA used supply-use tables for 2003-04. It was assumed that the same scaling factors were appropriate for 2006-07, and that they applied equally to all subsets of Australian tourism.

Besides, primary agriculture is used as a proxy for commercial fishing. Based on the value added share of Australian production in both commercial fishing and primary agriculture sector at ABS IO tables for 2001-02, the results from commercial fishing simulation are scaled.

## ATTACHMENT B: DATA SOURCES

### TOURISM

The sources of tourism data are:

- ❑ Tourism Research Australia (TRA) online database for international visitors and domestic visitors, for Australia, Queensland and Queensland tourism regions. The data include numbers of visitors, visitor nights, and expenditure details, although expenditures are for whole trips and splits between stopovers in different regions have to be estimated. The latest quarterly data used are up to and including the June quarter 2007.
- ❑ TRA has estimated total expenditures within tourism regions using its Regional Expenditure Model (REM) separately for international, day and domestic overnight visitors. The latest results used are for the year ending June 2007. REM (TRA 2007b, 2007c) excludes any expenditure by local residents before or after trips outside Australia.
- ❑ TRA CD-MOTA data up to June 2005-06 which are similar to the online data, but include some additional detailed expenditure data for single destination visits to regions.
- ❑ The TSA adjusts the TRA data to be consistent with the ABS National Accounts, and has published national totals and industry details for international, day and overnight visitors in 2005-06, together with tourism direct value added, GDP and employment (measured in persons) (ABS 5249.0, 2007).
- ❑ TRA has published tourism indirect value added, GDP and employment (persons) for 2005-06 (TRA 2007d).
- ❑ An additional source of tourism data is the number of visitors to the different regions of the GBRMP as recorded by registered tourism operators in collection of the Environmental Management Charge (EMC). The counts also include those exempted from the charge, such as ferry transfers to and from islands. However, these counts are restricted to visits associated with registered operators, and do not include visits to the park by individuals on private boats.

### COMMERCIAL FISHING

The sources of commercial fishing data are:

- ❑ Queensland Department of Primary Industries & Fisheries (DPI&F) commercial fishing logbook data for 'wild-water' or open water fishing. These include detailed records of tonnes, number of boats, fishing days, and estimated gross value of product for grid sizes that vary between 6 and 30 nautical miles on a side. Data are available for the GBR World Heritage Area (WHA)<sup>12</sup> and other areas.
- ❑ The WHA is slightly larger than the GBRMP but provides a sufficient approximation to the Park for the commercial fishing aspects of this report. The data refer to fish that are caught within the WHA, even though some of the relevant fishing boats come from ports such as Bundaberg that are within the GBRCA but just outside the GBRMP.

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<sup>12</sup> The GBR World Heritage Area differs from the GBRMP by including waters above the mean low water mark (the Marine Park boundary) and into the creeks and inter-tidal areas.

- ❑ DPI&F Fisheries farmgate values of aquaculture are available by Statistical Division to 2005-06 (Lobegeiger & Wingfield, 2007).
- ❑ Data for payments for commercial fishing licences and boat registration associated with use of the GBRMP, even though these payments are made to state authorities rather than to GBRMPA. They are contributions to the Queensland economy even if not directly to the GBRCA or GBRMP. Nevertheless, given that they are associated with use of the GBRMP, they could be argued to constitute contributions sourced both to the GBRCA and GBRMP. Neither commercial fishing licence fees (\$250 per annum) nor boat registration fees (\$250 per annum) have been included in the analysis. Unpublished data received from DPI&F indicate that 791 boats were used for commercial fishing in the GBRMP in 2005-06. Even allowing \$1,000 per boat, to allow for additional commercial fishing fees, total fees would be less than \$1 million.
- ❑ ABARE measures of tonnes, export tonnes, value of production, and value of exports for fishing and aquaculture in Queensland for 2005-06 (ABARE 2007).

## RECREATIONAL USE OF THE GBRMP

Because recreational expenditure is dominated by fishing, boats and other water activities, a useful indication of recreational activity within the GBRMP is the number of recreational vessel registrations within GBR communities (available from Queensland Transport, Marine Safety), as reported in Figure 6.1.

Some data are available for recreational fishing:

- ❑ DPI&F Fisheries conducted surveys of expenditure on recreational fishing in 2002 and 2005, but is yet to release reports on the results of these surveys; and
- ❑ Henry and Lyle (2003) estimated total expenditure on recreational fishing in Queensland in 2000-01 to be \$320 million.

DPI&F Fisheries provided Access Economics with some preliminary recreational fishing data for 2005. These were scaled to 2006-07 using Queensland total household expenditure.

Access Economics is not aware of any data for other recreational activities within the GBRMP, although the recreational fishing data contain total expenditure on boats and the proportion of this attributable to fishing – the remaining share can be attributed to other recreational activities. Access Economics devised what it considers to be plausible estimates of expenditure on recreational activities within the GBRMP.

## INPUT-OUTPUT TABLES

IO tables for 1996-97 are available electronically for Queensland and for all regions of Queensland, where the regions correspond to the Statistical Divisions in Queensland for 1996-97 (Queensland Office of the Government Statistician, 2002 & 2004). ABS has published national IO tables with 106 industries for 1996-97 (ABS 5209.0, 2001). However, the 1996-97 IO tables are now somewhat dated and we have made use of more recent data.

We have used industry by industry IO tables for Australia and Queensland for 2001-02, and generated Queensland regional IO tables from associated gross regional product data by industry. The data were supplied by the Productivity Commission (2006) as part of the MMRF-NRA (Monash Multi-Regional Forecasting – National Reform Agenda) model and are based on Australia-wide ABS IO tables (ABS 5209.0, 2006).

The broad structures of IO tables tend to be fairly steady over periods of five to ten years. In the absence of more recent data, the compositions (that is, proportions, but not the absolute levels) of industry costs and sales for 2001-02 are assumed by Access Economics to be

reasonable overall approximations for 2006-07. Value added, gross product and other sales-based estimates are scaled up from 2001-02 to 2006-07 using the estimated changes in Queensland and Australia gross value added by industry over that period (ABS 5220.0, 2007).

## **EMPLOYMENT**

The employment data are based on ABS labour force data by industry (17 ANZSIC industries) and region (SD-based) for the years ending May 2002 and May 2007 (ABS 6291.0.55.003, August 2007). These were then mapped into the 30 industries used for this analysis. In all cases employment was expressed in full time equivalents (FTE), calculated as the number of full time persons plus half the number of part time persons. The distribution of employment across industries is similar to that for value added but with differences that depend on the labour intensities of industries.

## **DATA LIMITATIONS**

The data available are subject to a number of limitations:

- ☐ IO tables and recreational fishing data are dated, necessitating a 'scaling up' process to generate 2006-07 estimates.
- ☐ The recreational fishing data are preliminary and the other recreational data are estimates.
- ☐ The data come from a wide variety of sources, and so the underlying methodologies used for their compilation may not be fully consistent.

## **ATTACHMENT C: INTER-REGIONAL, INTERSTATE AND INTERNATIONAL TRADE**

Sections 4, 5 and 6 have described the economic contributions of GBRMP activities in terms of contributions to value added, GDP/GSP/GAP and employment. An additional important measure of GBRMP activities is the net trade contribution to the region measured in terms of exports less imports.

Exports consist mainly of expenditures by outside visitors but there are also direct exports of fish from the region. These exports are offset by expenditures on imported goods and services into the region that are used as inputs into the GBRMP activities. Measures of net trade differ according to whether the region is the GBRMP/GBRCA, Queensland or Australia. While international exports and imports are the same in all cases, interstate exports and imports have to be taken into account when considering GBRMP/GBRCA or Queensland, but are ignored when assessing net trade for Australia as a whole.

Trade is measured entirely in terms of expenditures and direct exports, and is not connected directly to value added, GDP or employment.

In 2005-06 TSA tourism exports for Australia totalled \$20,526 million and TSA tourism imports totalled \$20,584 million (ABS 5249.0, 2007, Tables 15 and 14).

For Queensland, in addition to its shares of international tourism exports and imports, there are interstate imports corresponding to imports of goods and services used in the supply of tourism services and spending by Queenslanders visiting other States/Territories, and interstate exports corresponding to spending by persons from other States/Territories visiting Queensland. The Office of the Government Statistician (2002 & 2004) has provided estimates of Queensland's interstate exports and imports by industry in its Queensland and Queensland Regional IO Tables for 1996-97, and these can be used as a starting point for scaled-up estimates for 2006-07. The imports data can then be used to estimate the proportions of industry supplies in each of the industries that constitute tourism, commercial fishing and recreational activity.

For the GBRCA, in addition to international and interstate trade, there are also imports into the GBRCA from the rest of Queensland and spending by GBRCA residents on visits to the rest of Queensland and exports from GBRCA to the rest of Queensland. The individual regional IO tables contain estimates of inter-regional flows. The GBRCA IO table is constructed as the sum of four regional tables, although it does not have the inter-regional trade flows between these four regions netted out. As for Queensland, data by industry can be used to estimate the proportions of industry supplies associated with tourism, commercial fishing and recreational activity.

In the current analysis, all these measures are restricted to the set of visitors who visit the GBRCA. Imports associated with spending by GBRCA residents on trips outside the GBRCA are ignored, because decisions to make such trips have no connection with the GBRMP. Spending on outside trips would be included if the objective was to measure tourism net trade for the GBRCA. Furthermore, the estimates reported in this sub-section are restricted to the direct tourism imports and exports.

For Australia as a whole, exports and imports of the ANZSIC industry 'commercial fishing' are available in detailed national IO tables for 2001-02 (ABS 5209.0, 2006).

## EXPORTS

Exports of tourism are given by the expenditures that lie behind the value added results presented in Tables 4.2, 5.2 and 6.2. The procedure for splitting total expenditures across residents of the GBRCA, the rest of Queensland and other states contains approximations which introduce uncertainties into the estimates of exports.

We have no direct measure of commercial fishing exports from the GBRCA in 2006-07.

The value of seafood international exports for Queensland in 2005-06 (\$193 million) is 75% of the value of fisheries production caught in Queensland in 2005-06 (\$257 million) where both measures include both fish and aquaculture (ABARE 2007). However, the values of exports and production are not directly comparable because production value is measured at the point of landing the catch and exports are measured free on board for export. The export values include additional costs of processing, packaging and transport. However, these additional costs are small for Queensland.

We have assumed that international seafood exports account for 75% of the value of production for Queensland. Applying the same proportion to the GBRCA value of production (\$165 million in 2006-07, see Table 5.1) means that international exports from the GBRCA are \$124 million. For the purposes of this exercise, and in the absence of any data, we assume that the remaining \$41 million of commercial fishing in the GBRCA is shared equally between consumption within the GBRCA, exports to the rest of Queensland and exports to other states.

Exports of recreational fishing and other recreational activity, which correspond to activities of local residents within the GBRMP, are necessarily zero.

Access Economics' estimates of exports and imports associated with tourism in the GBRCA and commercial fishing and recreational activity in the GBRMP are presented in Table C.1 (GBRCA), Table C.2 (Queensland) and Table C.3 (Australia) below.

## IMPORTS

A trade assessment of tourism for the GBRCA would allow for imports arising from expenditure by GBRCA residents on trips outside the GBRCA. However, the focus of this report is on the GBRMP and such expenditures by GBRCA residents are not relevant and have been ignored, although external trips by GBRMPA and GBRMP researchers would be taken into account, in principle, if such data were available.

Imports consist of goods and services 'imported' into the GBRCA that are used as inputs into the tourism, commercial fishing and recreational activity industries. These inputs can be imported from either overseas, interstate, or other parts of Queensland.

For example, there is relatively little wine produced in Queensland and even less in the GBRCA, so that most wine is imported from other states and countries. Similarly, some food products are supplied from outside the region. Much machinery and many tourist souvenirs are imported into the GBRCA.

The calculations are much less simple in the cases of interstate and inter-regional imports than for international imports. The Queensland IO table contains the total value of interstate imports used by each industry, but not the industry composition of these imported inputs. Access Economics therefore uses an alternative approach.

**TABLE C.1: GBRCA EXPORTS AND IMPORTS FOR SELECTED GBRCA ACTIVITIES, 2006-07**

<i>Component of trade</i>	<i>Exports: visitors to GBRCA</i>	<i>Imports: inputs of goods and services</i>	<i>Net exports</i>
<i>Tourism</i>			
Visitors from GBRCA		\$340	-\$340
Visitors from rest of Queensland	\$1,082	\$170	\$912
Visitors from interstate	\$2,183	\$288	\$1,895
Visitors international	\$1,759	\$416	\$1,343
<b>GBRCA total tourism</b>	<b>\$5,023</b>	<b>\$1,214</b>	<b>\$3,810</b>
GBRMP commercial fishing	\$151	\$49	\$102
GBRMP recreational fishing		\$62	-\$62
GBRMP other recreational activity		\$33	-\$33
<b>Total trade contribution to GBRCA</b>	<b>\$5,174</b>	<b>\$1,325</b>	<b>\$3,850</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

**TABLE C.2: QUEENSLAND EXPORTS AND IMPORTS FOR SELECTED GBRCA ACTIVITIES, 2006-07**

<i>Component of trade</i>	<i>Exports: visitors to GBRCA</i>	<i>Imports: inputs of goods and services</i>	<i>Net exports</i>
<i>Tourism</i>			
Visitors from GBRCA		\$340	-\$340
Visitors from rest of Queensland		\$170	-\$170
Visitors from interstate	\$2,183	\$288	\$1,895
Visitors international	\$1,824	\$446	\$1,378
<b>GBRCA total tourism</b>	<b>\$4,007</b>	<b>\$1,244</b>	<b>\$2,763</b>
GBRMP commercial fishing	\$138	\$49	\$89
GBRMP recreational fishing		\$62	-\$62
GBRMP other recreational activity		\$33	-\$33
<b>Total trade contribution to Queensland</b>	<b>\$4,144</b>	<b>\$1,355</b>	<b>\$2,790</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

**TABLE C.3: AUSTRALIAN EXPORTS AND IMPORTS FOR SELECTED GBRCA ACTIVITIES, 2006-07**

<i>Component of trade</i>	<i>Exports: visitors to GBRCA</i>	<i>Imports: inputs of goods and services</i>	<i>Net exports</i>
<i>Tourism</i>			
Visitors from GBRCA		\$176	-\$176
Visitors from rest of Queensland		\$81	-\$81
Visitors from interstate		\$134	-\$134
Visitors international	\$1,935	\$369	\$1,566
<b>GBRCA total tourism</b>	<b>\$1,935</b>	<b>\$761</b>	<b>\$1,174</b>
GBRMP commercial fishing	\$124	\$2	\$122
GBRMP recreational fishing		\$37	-\$37
GBRMP other recreational activity		\$19	-\$19
<b>Total trade contribution to Australia</b>	<b>\$2,059</b>	<b>\$800</b>	<b>\$1,259</b>

Source: Access Economics. Totals may differ from sums of components due to rounding.

For each industry, the import share of production is multiplied by the tourism demand for that industry, and then summed across industries. The same procedure can be used for commercial fishing and recreational fishing. In the cases of recreational fishing and other recreational activity, adjustment must be made for the overlap with tourism. The results presented in Tables C.1, C.2 and C.3 are indicative because they rely on 2001-02 import shares for Queensland and Australia.

## **GBRCA EXPORT AND IMPORT ESTIMATES: SOME COMMENTS**

The above trade figures show that the sum of the contributions from the selected GBRCA activities results in a net trade surplus of the order of \$3.9 billion for the GBRCA (Table C.1), \$2.8 billion for Queensland (Table C.2), and \$1.3 billion for Australia (Table C.3).

In contrast with the relationships for value added and employment, exports of tourism increase moving down from Australia as a whole to GBRCA, because expenditures by visitors from interstate and the rest of Queensland count as exports for GBRCA but not for Australia. Similarly, imports of goods and services are larger for GBRCA than for Australia because imports for Australia are international imports only, whereas imports for GBRCA also include imports from interstate and other Queensland regions.

Many of the entries in these three tables depend on key assumptions and approximations, necessitated by lack of available data, and the numerical results are sensitive to these.

Imports of goods and services have been calculated by assuming that imports into each industry, for the activities of interest, are in the same proportions as for those industries as represented in the three 1996-97 IO tables. This leads to two possible sources of error. Firstly, the import shares may have changed since 1996-97. Secondly, the import share for the tourism part of an industry may not be the same as the import share for the industry as a whole.

The TSA for 2005-06 (ABS 5249.0, 2007) provides a partial check on imports of tourism goods and services for Australia. Table 8 in that publication shows that total imports

purchased in Australia by tourists in 2003-04 were \$4,259 million. The GBRCa accounted for about 8.2% of total expenditure on tourism in Australia in 2006-07.

If we assume that the same share applies to imports, then GBRCa would have accounted for \$349 million of imports into tourism in 2003-04. The corresponding value in 2006-07 is \$472 million if it is assumed that it increased by a factor of 1.351 representing cumulative growth in the nominal value of Australian imports over the period from 2003-04 to 2006-07 (ABS 5204.0, 2007, Table 5).

The value of \$800 million in Table C.3 is larger. This suggests that the imports of goods and services presented in Table C.3, and also presumably Table C.1 and Table C.2, may be moderate overestimates.

## ATTACHMENT D: SUMMARY OF REPORT COMPARISON

Table D.1 summaries the results of Access Economics reports for 2004-05, 2005-06 and 2006-07. Differences between results are mostly driven by the expenditure change over time. Methodology is also different based on different input output table. Besides, industry definition on recreational activities is different – culture activity which is not considered in 2006-07 report is included in 2004-05 and 2005-06 report.

The differences in data and methodology between the 2006-07 analysis presented in this report and the earlier analyses are as follows.

- ❑ The 2006-07 analysis uses IO tables for 2001-02 derived by the Productivity Commission, whereas the 2005-06 analysis used IO tables for 1996-97 (ABS and Office of the Government Statistician, Queensland 2002 and 2004).
- ❑ A revised set of industries underlying the IO analysis.
- ❑ Access to TRA CD-MOTA on line, as used for 2006-07, provides fewer details of tourism expenditure data than previously.
- ❑ Revised computer programs for extracting expenditures from TRA and TSA data, mapping these into IO industries, and computing direct and indirect contributions.
- ❑ TSA 2005-06 generated direct contributions consistent with the revised national accounts introduced in November 2005. Consequently, contributions for earlier years were revised.
- ❑ TRA has calculated indirect tourism contributions for Australia in 2005-06. Corresponding up to date results were not available for the earlier Access Economics reports.
- ❑ Values of production for commercial 'wild water' fishing provided by DPI&F Fisheries are approximately two thirds of values for the same years that were supplied for the 2005-06 report.

These differences mean that is not yet possible to examine time series for economic contributions. The best option for analysing changes over time remains the raw data and updated IO table underlying the analysis.

**TABLE D.1: COMPARISON OF REPORTED CONTRIBUTIONS OF GBRMP/GBRCA ACTIVITIES TO THE GBRCA AND AUSTRALIA, 2004-05, 2005-06 AND 2006-07, VALUE ADDED AND EMPLOYMENT**

<i>GBRCA/GBRMP activity</i>	<i>GBRCA 2004-05</i>	<i>GBRCA 2005-06</i>	<i>GBRCA 2006-07</i>	<i>Australia 2004-05</i>	<i>Australia 2005-06</i>	<i>Australia 2006-07</i>
<b>Value added (\$m)</b>						
<i><b>Direct contributions</b></i>						
Visitors from GBRCA	420	392	507	416	387	575
Visitors from rest of Queensland	324	311	375	396	356	461
Interstate visitors	575	740	787	708	922	966
GBRCA residents for travel outside GBRCA	122	126		125	129	
International visitors	589	628	589	862	926	680
<b>GBRCA total tourism</b>	<b>2,030</b>	<b>2,197</b>	<b>2,257</b>	<b>2,507</b>	<b>2,720</b>	<b>2,682</b>
GBRMP commercial fishing	133	116	89	131	114	87
GBRMP recreational use	301	301	61	315	314	72
<b>Total direct contribution</b>	<b>2,465</b>	<b>2,614</b>	<b>2,408</b>	<b>2,952</b>	<b>3,148</b>	<b>2,841</b>
<i><b>Indirect contributions</b></i>						
Visitors from GBRCA	166	169	258	357	362	555
Visitors from rest of Queensland	136	131	178	328	303	414
Interstate visitors	237	303	371	573	739	859
GBRCA residents for travel outside GBRCA	43	49		86	99	
International visitors	238	251	281	666	707	607
<b>GBRCA total tourism</b>	<b>819</b>	<b>903</b>	<b>1,087</b>	<b>2,011</b>	<b>2,211</b>	<b>2,435</b>
GBRMP commercial fishing	54	47	28	143	124	52
GBRMP recreational use	105	105	36	229	229	81
<b>Total indirect contribution</b>	<b>979</b>	<b>1,055</b>	<b>1,150</b>	<b>2,383</b>	<b>2,564</b>	<b>2,567</b>
<b>Employment (FTE, 000)</b>						
<i><b>Direct contributions</b></i>						
Visitors from GBRCA	6.0	5.2	5.8	6.2	5.5	6.0
Visitors from rest of Queensland	3.9	3.8	4.0	4.7	4.4	4.5
Interstate visitors	7.1	8.6	8.1	8.3	10.1	9.2
GBRCA residents for travel outside GBRCA	1.3	1.2		1.4	1.3	
International visitors	7.8	8.2	6.7	10.0	10.3	7.1
<b>GBRCA total tourism</b>	<b>26.1</b>	<b>27.0</b>	<b>24.6</b>	<b>30.6</b>	<b>31.6</b>	<b>26.7</b>
GBRMP commercial fishing	1.0	1.0	1.2	1.0	0.8	1.2
GBRMP recreational use	6.4	4.8	0.9	5.6	5.5	0.9
<b>Total direct contribution</b>	<b>33.5</b>	<b>32.8</b>	<b>26.7</b>	<b>37.2</b>	<b>37.9</b>	<b>28.8</b>
<i><b>Indirect contributions</b></i>						
Visitors from GBRCA	2.0	1.8	2.9	3.9	3.9	5.4
Visitors from rest of Queensland	1.6	1.4	2.0	3.5	3.2	4.0
Interstate visitors	2.8	3.2	4.2	6.2	7.8	8.3
GBRCA residents for travel outside GBRCA	0.5	0.5		0.9	1.0	
International visitors	2.8	2.6	3.2	7.1	7.4	5.9
<b>GBRCA total tourism</b>	<b>9.6</b>	<b>9.4</b>	<b>12.3</b>	<b>21.7</b>	<b>23.3</b>	<b>23.6</b>
GBRMP commercial fishing	0.5	0.4	0.3	1.1	0.9	0.5
GBRMP recreational use	1.8	1.6	0.4	3.5	3.5	0.8
<b>Total indirect contribution</b>	<b>11.9</b>	<b>11.4</b>	<b>13.1</b>	<b>26.3</b>	<b>27.7</b>	<b>25.0</b>

Source: Table 4.2, Table 5.2, Table 6.2, Access Economics (2007). Totals may differ from sums of components due to rounding.