

Encounter Marine Park Regional Impact Statement

A report prepared for
Department of Environment, Water and Natural Resources

Prepared by



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Contents

Contents	iii
List of Tables	iv
List of Appendix Tables.....	iv
List of Figures	v
List of Appendix Figures	v
Abbreviations	vi
Acknowledgements.....	vii
Document History and Status	vii
Executive Summary	viii
1. Introduction.....	1
1.1 Marine Park Planning Process.....	1
1.2 Policy Commitments	4
1.2.1 Displaced Commercial Fishing Policy Framework.....	4
2. Method of Assessment	5
2.1 Ecological.....	5
2.2 Economic.....	6
2.3 Social	7
3. Encounter Marine Park Description	10
3.1 Ecological Description	10
3.2 Socio-economic Profile	12
4. Summary of Impacts.....	17
4.1 Ecological.....	17
4.1.1 Habitats	17
4.1.2 Species.....	18
4.1.3 Ecosystems	28
4.1.4 Case studies	29
4.2 Economic.....	32
4.2.1 Commercial Fishing	32
4.2.2 Aquaculture.....	41
4.2.3 Property Prices	42
4.2.4 Tourism.....	42
4.2.5 Port, Harbour and Shipping Operations	43
4.2.6 Mining	43
4.2.7 Coastal Development.....	44
4.3 Social	44
4.3.1 Summary of method.....	44
4.3.2 Expected social impacts – at a glance	45
4.3.3 Education and Wellbeing	46
4.3.4 Culture and Heritage.....	47
4.3.5 Recreation and Fishing	47
4.3.6 Local Government, Population and Housing	50
4.3.7 Community.....	51
4.3.8 SEIFA based analysis of impacts.....	51

4.3.9	Next Steps in Social Impact Assessment	52
References	55
Appendix 1	Socio-economic Profile	60
Appendix 2	Activities and Uses Tables	86
Appendix 3	List of Parties Consulted	99
Appendix 4	MPSIAT feedback	102
Appendix 5	Map of Marine Park Showing Draft Zoning.....	107

List of Tables

Table 1-1	Public consultation process to date.....	3
Table 3-1	Summary of habitats.....	11
Table 3-2	Summary of key economic and social indicators for the Fleurieu & Coorong region.....	14
Table 3-3	Summary of key economic and social indicators for Kangaroo Island.....	16
Table 4-1	Predicted habitat responses to zoning	17
Table 4-2	Potential first-order responses of some indicator species ^a	24
Table 4-3	Other species which may respond to or benefit from protection	27
Table 4-4	Regional economic impact of marine park zoning based on SARDI estimates of displaced effort	33
Table 4-5	Regional economic impact of marine park zoning on pipi based on SARDI estimates of displaced effort.....	36
Table 4-6	Average annual Marine Scalefish effort in draft sanctuary zones by sector.....	37
Table 4-7	Average annual Marine Scalefish catch in draft sanctuary zones by main species	37
Table 4-8	Regional economic impact of marine park zoning on the Marine Scalefish fishery based on SARDI estimates of displaced effort	38
Table 4-9	Regional economic impact of marine park zoning on the Marine Scalefish fishery based on industry estimates of displaced effort.....	39
Table 4-10	Regional economic impact of marine park zoning on the Charter Boat fishery based on SARDI estimates of displaced effort	40
Table 4-11	Social impact for Fleurieu and Coorong Impact Region	52

List of Appendix Tables

Appendix Table 1-1	Summary of key economic and social indicators for the Fleurieu & Coorong region.....	61
Appendix Table 1-2	Age distribution of the population for the Fleurieu & Coorong region and SA, 2000/01 to 2009/10	62
Appendix Table 1-3	Highest level of qualifications for persons aged 15 and over in the Fleurieu & Coorong region and SA, 2001 and 2006 ^a	64
Appendix Table 1-4	School enrolment in the Fleurieu & Coorong region and SA, 2001, 2006 and 2011	65

Appendix Table 1-5	Employment, household income and household expenditure, Fleurieu & Coorong region, 2009/10 ^a	69
Appendix Table 1-6	Components of gross regional product in the Fleurieu & Coorong region by industry, 2009/10 ^a	70
Appendix Table 1-7	Value of imports and exports by industry, Fleurieu & Coorong region, 2009/10 ^a	71
Appendix Table 1-8	Summary of key economic and social indicators for Kangaroo Island	73
Appendix Table 1-9	Age distribution of the population for Kangaroo Island and SA, 2000/01 to 2009/10	74
Appendix Table 1-10	Highest level of qualifications for persons aged 15 and over on Kangaroo Island and SA, 2001 and 2006 ^a	76
Appendix Table 1-11	School enrolments in the Kangaroo Island region and SA, 2001, 2006 and 2011	77
Appendix Table 1-12	Employment, household income and household expenditure, Kangaroo Island region, 2009/10 ^a	81
Appendix Table 1-13	Components of gross regional product in the Kangaroo Island region by industry, 2009/10 ^a	82
Appendix Table 1-14	Value of imports and exports by industry, Kangaroo Island region, 2009/10 ^a	82
Appendix Table 4-1	General views about the Encounter Marine Park	102
Appendix Table 4-2	Tourism, education & wellbeing impacts for Encounter Marine Park	103
Appendix Table 4-3	Culture and heritage impacts for Encounter Marine Park	104
Appendix Table 4-4	Recreation & fishing impacts for Encounter Marine Park	104
Appendix Table 4-5	Population & housing impacts for Encounter Marine Park	105
Appendix Table 4-6	Community response impacts for Encounter Marine Park	106

List of Figures

Figure 1–1	Marine Park Zones	2
Figure 4–1	Simplified conceptual food web for subtidal high profile reef	29

List of Appendix Figures

Appendix Figure 1–1	Fleurieu & Coorong region	60
Appendix Figure 1–2	Kangaroo Island region	72
Appendix Figure 5–1	Map of Marine Park Showing Draft Zoning	107

Abbreviations

ABS	Australian Bureau of Statistics
C	Council
CBA	Cost Benefit Analysis
DC	District Council
DEH	Department for Environment and Heritage
DENR	Department of Environment and Natural Resources
DEWNR	Department of Environment, Water and Natural Resources
DMITRE	Department for Manufacturing, Innovation, Trade, Resources and Energy
fte	full-time equivalent
GABMPCC	Great Australian Bight Marine Park Consultative Committee
GMUZ	General Managed Use Zone
GRP	gross regional product
HPZ	Habitat Protection Zone
MPLAG	Marine Park Local Advisory Group
MPSIAT	Marine Parks Social Impact Assessment Tool
NL	natural level
PIRSA	Department of Primary Industries and Regions SA
RAZ	Restricted Access Zone
RIAS	Regional Impact Assessment Statement
RIS	Regional Impact Statement
RISE	Regional Industry Structure and Employment
SA	South Australia
SAMPIT	South Australian Marine Parks Information Tool
SARFAC	South Australian Recreational Fishing Advisory Council
SARDI	South Australian Research and Development Institute
SIA	social impact assessment
SEIFA	Socio-Economic indexes for Areas
SLA	Statistical Local Area
SPA	Special Purpose Area
SZ	Sanctuary Zone
TACC	total allowable commercial catch
UNHL	unnaturally high level
UNLL	unnaturally low level

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Executive Summary

The Encounter Marine Park straddles the transition between the Gulf St Vincent and Coorong Bioregions. It encompasses waters off southern metropolitan Adelaide and the Fleurieu Peninsula, extending past the Murray Mouth to the Coorong coast. The marine park includes all waters of Backstairs Passage and the eastern shores of Kangaroo Island.

Impacts of implementing the draft management plans were assessed against a base case scenario of no management plans. The base case is not static, and requires an understanding of the existing trends in natural resource, economic and social conditions. There are external factors which influence both the 'with management plan' and the base case scenarios that were taken into consideration.

Marine Park Profile

The park contains a range of ecosystems, including major estuaries, gulf waters, exposed coasts and sheltered bays, shaped by a wide variety of physical influences.

The gulf-facing coast of the southern Fleurieu Peninsula is characterised by large, open beaches backed by cliff or dunes, generally shallow waters, with input from the Onkaparinga River and many small estuaries. Subtidal habitats include a variety of reef forms and extensive seagrass beds. The southern coast is diverse, with sheltered and exposed beaches, intertidal platform reef, offshore platform and granitic boulder reefs and extensive sandy seafloor habitats and seagrass beds and limestone reef in Encounter Bay, amongst granite islands.

Backstairs Passage includes a range of habitats extending from cliffs and headlands of Dudley Peninsula into a deep submarine trench, up to 80 metres deep, lined with large sponges and other invertebrates. The Pages is a group of granitic islands surrounded by fringing reef.

The Coorong coast contains part of one of Australia's longest continual sandy beaches, and is strongly influenced by the Murray Mouth and connectivity with the Coorong Lagoon which supports a diverse range of aquatic and terrestrial plants and animals.

On Kangaroo Island, there are extensive and dense seagrass meadows to the east (Antechamber Bay), and large areas of seagrass, sandy seafloor habitat and shallow reefs in sheltered bays to the west, and the semi-enclosed Pelican Lagoon which supports a range of reef, seagrass, sponge and sandy seafloor communities.

From a socio-economic viewpoint the communities relevant to the Encounter Marine Park are those of the Fleurieu and Coorong region and Kangaroo Island.

The six statistical local areas (SLAs) that comprise the Fleurieu and Coorong region are Yankalilla (DC), Victor Harbor (C), Alexandrina – Coastal (SLA), Onkaparinga – South Coast (SLA), Onkaparinga – North Coast (SLA) and The Coorong (DC). Some of the key socio-economic characteristics of the region include:

- a resident population of almost 90,000 persons in 2010/11.
- a similar concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and, consequently, a higher than average share of people aged 65 and over compared with the State.

- The total population is projected to increase by almost 56 per cent by 2026, whereas the SA population is expected to increase by around 23 per cent.
- The unemployment rate in the Fleurieu and Coorong region was 8.1 per cent in the June quarter of 2011, well above the state rate.
- Approximately 21 per cent of the businesses in the Fleurieu and Coorong region were in the agriculture, forestry and fishing sector
- Mean taxable income was \$47,000 in 2009/10, 13.0 cent below SA's average of \$54,000.
- Over the period 2000/01 to 2010/11, median dwelling (units and houses) prices increased by 209 per cent (\$326,250 in 2010/11) compared with a 197 per cent in SA as a whole (\$357,500).

In 2009/10, the top four contributors to GRP were the manufacturing (14 per cent), ownership of dwellings (13 per cent), agriculture, forestry and fishing and building and construction (8 per cent each) sectors.

The commercial fishing and tourism industries are important to the local economy in terms of contributing to jobs and GRP. Directly and indirectly commercial fishing and aquaculture contributed 0.3 per cent of GRP (\$7.3 million) and 0.3 per cent of employment (86 jobs) in 2009/10. By comparison, the tourism sector contributed 6 per cent of GRP (\$135.3 million) and 8 per cent of employment (2,160 fte jobs).

Kangaroo Island (DC) is comprised of a single statistical local area. Some of the key socio-economic characteristics of the region include:

- a resident population of almost 4,700 persons in 2010/11.
- a slightly higher than average concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and a similar share of people aged 65 and over compared with the State.
- Total population on is projected to increase by around 20 per cent by 2026, whereas the SA population is expected to increase by around 23 per cent.
- The unemployment rate on Kangaroo Island was almost 3.9 per cent in the June quarter of 2011, below the state rate of 5.3 per cent.
- Over 50 per cent of the businesses on Kangaroo Island were classified in the agriculture, forestry and fishing sector.
- Mean taxable income was \$44,000 in 2009/10, 19 per cent below SA's average of \$54,000.
- Over the period 2000/01 to 2010/11, median dwelling prices increased by 176 per cent (\$235,000 in 2010/11) compared with a 197 per cent in SA as a whole (\$357,500).
- In 2009/10, the top contributors to GRP were the agriculture, forestry and fishing (20 per cent), transport and storage (10 per cent), ownership of dwellings (9 per cent), and accommodation, cafes and restaurants (8 per cent) sectors.
- The commercial fishing and tourism industries are important to the local economy in terms of contributing to jobs and GRP. Directly and indirectly commercial fishing and aquaculture contributed 3 per cent of GRP (\$4.7 million) and 3 per cent of employment (74 fte jobs) in 2009/10. By

comparison, the tourism sector contributed 38 per cent of GRP (\$62.0 million) and 43 per cent of employment (960 fte jobs).

Ecological Impacts

Many habitats within the park can be considered to be at a level comparable to the time of European settlement, although some habitats have been significantly modified, particularly near population centres in the southern suburbs of Adelaide, and near Victor Harbor and Kingscote. Habitat changes have also been documented offshore in Gulf St Vincent and attributed to prawn trawling. A number of species within the park were assessed as having lower abundances compared with pre-European levels. The current state of the ecosystems in the park was generally considered to reflect the condition of their component habitats and species.

The proposed management arrangements are predicted to have a net positive long-term impact on South Australia's marine biodiversity. Without the proposed management arrangements there is potential for future activities to occur that could impact on marine habitats, species and ecosystems. The positive ecological impacts inside the Encounter Marine Park will include (1) maintenance of habitats and ecosystems in relatively good condition, and (2) changes in some ecosystems towards a more natural and resilient condition. Such changes include increases in the size and abundance of some fished species, which may potentially have socio-economic benefits, and the overall shift towards a more natural ecosystem is also expected to provide a number of management benefits, although these potential benefits have not been quantified.

Areas previously trawled within habitat protection zones (HPZ) and sanctuary zones (SZ) are expected to show an increase in cover of the benthic species that characterise subtidal sand habitat. Restrictions on motorized water sports in SZs on the western Fleurieu Peninsula and in Encounter Bay are expected to reduce noise pollution and other interactions with dolphins and/or whales. The proposed zoning is not predicted to change the current status of the degraded reefs off southern Adelaide nor the degraded seagrass meadows in Western Cove on Kangaroo Island, which require complementary management measures, but the various zone restrictions (with HPZ and SZ covering about 63 per cent and 10 per cent of the park, respectively) will assist with the future protection of habitats from a range of potentially damaging activities that may otherwise be possible under the existing management framework. Some habitats of particular conservation note include deep-sea sponge gardens, the only known bed in South Australia of *Heterozostera tasmanica*, *Posidonia coriacea* beds off Aldinga Beach and Wetlands of National Importance in the Onkaparinga Estuary and Pelican Lagoon. Maintenance of healthy habitats in general is essential for the functioning of ecosystems and the long-term sustainability of fisheries, aquaculture, and marine-based tourism.

There is some uncertainty about the extent to which zoning will provide future protection in areas near Kingscote, Penneshaw, and Victor Harbor and in part of Backstairs Passage due to the proposed establishment of special purpose areas for harbor activities and an underground cable. However, it is expected that the designation of areas worthy of zoning as SZs and HPZs would assist in directing future activities appropriately.

A number of species when considered in isolation (namely southern rock lobster, greenlip and blacklip abalone, snapper, razorfish, mud cockle, Goolwa cockle, Bight redfish, swallowtail, sea sweep, western blue groper, harlequin fish, and bluethroat wrasse) have potential for long-term increases in size and abundance inside some of

the sanctuary zones. Southern rock lobster, greenlip/blacklip abalone, southern calamary, razorfish, mud cockle, and Goolwa cockle all have potential for increased larval export to areas outside the sanctuary zones. Southern rock lobster, Goolwa cockle, snapper, Bight redfish, swallowtail, and sea sweep have potential for spill-over of adults to areas outside the sanctuary zones. These changes may potentially have socio-economic benefits, although not quantified in this report. However, some of the ecosystems in which these species interact are expected to shift towards a pre-European state, which may result in declines rather than increases of some species such as blacklip abalone.

Economic Impacts

In summary, the proposed draft zoning is expected to have the following economic impacts on the following sectors of the regional economy: potential positive impact in the tourism sector in the medium to long term, neutral impact in the aquaculture, property, marine infrastructure and operations, mining and coastal development sectors and short, medium and long term negative impacts in the commercial fishing sector.

Commercial fishing

Table ES1 shows the economic impact on the regional economy of marine park zoning on all affected fisheries. Impacts are based on SARDI's average annual displaced catches and corresponding average annual prices expressed in 2011 dollars. In aggregate, it was estimated that the impact of marine park zoning will generate the following loss of regional economic activity on an ongoing annual basis.

- Approximately \$1.98m in GRP which represents 0.08 per cent of the regional total (\$2.46b).
- Approximately 28 fte jobs which represent 0.1 per cent of the regional total (28,789 fte jobs).
- Approximately \$1.28m in household income which represents 0.1 per cent of that regional total (\$1.33b).

Because the reduced access to the fishery will be permanent, the impacts reported in Table ES1 are an estimate of the on-going, annual impact. The State Government has committed to buy out licences and quota entitlements to offset any unsustainable displaced effort and catch. Although details of the buyout are yet to be finalised, any such payments have the potential to at least partially offset the negative impacts outlined above.

The economic impacts could be greater as the estimated displaced catch may understate the actual catch in some sanctuary zones if they are located on important fishing grounds (hot spots). Impacts could also be over-estimated if sanctuary zones avoid hot spots (Ward and Burch 2012; Stevens et al. 2011a and 2011b). The zoning process attempted to avoid impacts on fishing by avoiding important fishing grounds. PIRSA has advised that statewide some draft sanctuary zones are located on important fishing grounds (hotspots), however advice specific to this park has not been provided. According to industry-derived estimates of displaced catch (which are yet to be reviewed by SARDI), the aggregate regional impacts could be as high as 36 fte jobs and \$2.48m in GRP.

Table ES1 Regional economic impact of marine park zoning based on SARDI estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Lakes & Coorong	-0.88	25%	-10	34%	-0.55	43%	-0.68	34%
Marine Scalefish	-0.10	3%	-1	5%	-0.05	4%	-0.08	4%
Charter Boat	-0.08	2%	-1	3%	-0.03	2%	-0.05	3%
Downstream ^b	-1.04	29%	-8	27%	-0.26	20%	-0.41	21%
<i>Total Direct ^c</i>	<i>-2.11</i>	<i>59%</i>	<i>-19</i>	<i>68%</i>	<i>-0.89</i>	<i>69%</i>	<i>-1.22</i>	<i>62%</i>
<i>Total Flow-on ^c</i>	<i>-1.47</i>	<i>41%</i>	<i>-9</i>	<i>32%</i>	<i>-0.40</i>	<i>31%</i>	<i>-0.76</i>	<i>38%</i>
Total ^c	-3.59	100%	-28	100%	-1.28	100%	-1.98	100%
Regional Total ^d	4,744.22		28,789		1,332.60		2,463.87	
Impact on Region	-0.08%		-0.10%		-0.10%		-0.08%	

^a Full-time equivalent jobs.

^b Downstream activities consist of seafood processing, transport, retail trade and food services.

^c Totals may not sum due to rounding.

^d Fleurieu and Coorong region (see Appendix 1).

Source: EconSearch analysis

The potential cumulative impact of the proposed extension to and revised zoning of the Commonwealth Great Australian Marine Park and the proposed Western Eyre Commonwealth Marine Reserve may place further pressure on fishing business viability.

The aggregate quantified impacts are not large for the economy of the Fleurieu and Coorong region, which is a relatively diverse and integrated one. Of the 5,735 businesses operating in the region, approximately 20 per cent were classified in the agriculture, forestry and fishing sector (in some regions the figure is over 50 per cent). To illustrate the diversity, in 2009/10 the top four contributors to fte jobs in the region were estimated to be in the manufacturing (18 per cent), retail trade (16 per cent), health and community services (11 per cent) and building and construction (9 per cent) sectors.

However, unemployment in the Fleurieu and Coorong region is relatively high (8.1 per cent at June 2011) when compared with the state average (5.2 per cent). This suggests that alternative regional opportunities for unemployed labour will be difficult to find and any job losses will be real and unlikely to be absorbed into the local workforce. Furthermore, most fishing operations, such as charter boats, are located in small fishing and tourism orientated settlements (e.g. Cape Jervis) where the relative impacts of reduced economic activity could be quite high.

On Kangaroo Island the dependency of the economy is far greater than the the Fleurieu and Coorong region. Of the 687 businesses operating in the Kangaroo Island region, approximately 52 per cent were classified in the agriculture, forestry and fishing sector. In contrast to the Fleurieu and Coorong region, however, the unemployment rate on Kangaroo Island region (3.9 per cent) is below the state average (5.2 per cent) at June 2011. Although the aggregate quantified impacts are not large for the Encounter Marine Park they will be compounded with the impacts of the Western Kangaroo Island and Southern Kangaroo Island Marine Parks.

Aquaculture

There are no known current or potential impacts expected from the draft zoning in this marine park on current or future aquaculture enterprises. This is consistent with Government policy commitments.

Tourism

The actual placement of sanctuary zones is unlikely to place real restriction on recreational fishing with sanctuary zones over highly fished areas limited. However, the perception that recreational fishing opportunities will be restricted by implementing 'no-take' zones is real. So there is potential for a downturn in fishing-based tourism in the short-term until visitors are informed and convinced of the actual situation on the water. In the long-term, managed marine parks will provide certainty that the marine environment within them is being protected and this may support the growth of the ecotourism industry, provided the necessary investment in tourism infrastructure and support services is undertaken. Other, non-extractive tourism, such as diving, is likely to benefit from the implementation of sanctuary zones.

Property prices

Given that the overall impact on the region is not expected to be large in absolute terms, the impact on property values is, similarly, not expected to be significant. States of Australia have introduced marine parks with sanctuary zones in the last decade without any known long-term effects on property values. External factors notwithstanding, the trend in Fleurieu and Coorong and Kangaroo Island residential property prices, illustrated in the regional socio-economic profiles, is unlikely to be affected by the proposed marine park zoning.

Port, harbour and shipping operations

There are numerous marine infrastructure and operations which are zoned special purpose areas, and their operation is not expected to change. In addition, the Murray Mouth has been zoned as a special purpose area to enable dredging to occur. GMUZ-5 off Kangaroo Island caters for growing cruise ship activity, the Cape Jervis to-Penneshaw ferry operations and potential export activities off Ballast Head. An expansion proposal by Adelaide Brighton Ltd at Rapid Bay has also been accommodated through zoning. No significant impacts on shipping activities arising from the zoning in this park are expected, which is consistent with Government policy commitments.

Mining

There is a petroleum exploration licence partially overlapping this marine park, extending offshore north of Christies Beach, across to Kangaroo Island and into parts of Gulf St Vincent. There are numerous private mines adjacent to the park for sand and limestone between Moana and Rapid Head, and one mineral exploration licence application immediately adjacent to the marine park. Conditions attached to existing licences will not change and the operations to which these licences refer to will not be affected by zoning. Licence applications will be required to go through a joint approval process administered by DMITRE and DEWNR, which may be a potentially lengthier and therefore more costly process to the applicant. Zoning limits the types of exploration activities permitted, and could potentially discourage certain types of applications and hence limit exploration and exploitation of resources. However no examples have been highlighted.

Coastal development

Transshipment of woodchips from Ballast Head off American River (proposed GMUZ-5) is planned from 2017. No foreseeable impacts are expected.

Social Impacts

The overall social impacts of the Encounter Marine Park on communities living in the Fleurieu and Coorong region and on Kangaroo Island are expected to be high for fishing families given the magnitude of the economic impacts that have been projected and low to moderate for the community as a whole. Commercial fishing is estimated to contribute 86 jobs to employment in the Fleurieu and Coorong region and a further 74 jobs on Kangaroo Island. Economic impact assessment identifies a loss of 28 commercial fishing-related jobs, in a region with high levels of unemployment and moderate levels of measured relative disadvantage. The State Government has committed to buy out licences and quota entitlements to offset any unsustainable displaced effort and catch. Although details of the buyout are yet to be finalised, any such payments have the potential to at least partially offset the negative impacts outlined above. The impact on recreational fishing is considered to be low to moderate with adjustments in zoning designed to minimise any potential negative impacts.

No impacts on local government operations, infrastructure and revenue or compliance related activities are expected as a result of the proposed draft zoning.

Experience elsewhere in Australia and internationally, suggests that a range of benefits from the establishment of marine parks become evident over time. These include increased opportunities for education about marine life and conservation, and increased tourism and ecotourism opportunities. This experience indicates that these benefits usually take approximately five years to be evident, and that in the earliest stages of marine protected areas being developed, local communities are more likely to identify possible negative impacts than potential benefits. It takes time to observe how the park's ecological and economic impacts evolve, with social impacts (positive or negative) flowing from these.

Marine parks have broad support in the South Australian community. Market research commissioned by the state government between 2006 and 2012 found strong support for the concept of marine parks among South Australians with approximately 85 per cent in favour of them in 2012 (87 per cent support in metropolitan Adelaide and 82 per cent support in regional areas). Those least likely to support marine parks have been fishing groups (in 2009 55 per cent of respondents who did not support marine parks identified restricted fishing as the reason, this dropped to 39 per cent in 2012). Between 2011 and 2012 the market research findings identify a decline in those who believe they will have limited access to marine parks and an increase in those who associate swimming, boating and snorkelling with marine parks.

A critical factor in determining the ultimate impact of marine parks is how well local communities are able to adapt to change and how cohesive they are in supporting each other through change. Feedback provided for the social impact assessment indicates that most communities living near the Encounter Marine Park will be sufficiently resilient to manage these changes, with the potential exception of Cape Jervis. The level of support provided by government to adjust to change is also crucial. One very important factor that affects community attitudes is how informed they are, and feedback from market research and marine park local advisory groups, as well as analysis of media reports indicates a gap in this information. In particular, increasing communities' understanding of the scientific rationale underpinning marine protected

areas, and the benefits that these can bring, needs to be enhanced. This is one of the functions of impact assessment which is best conceived of as a continuous process informing both the establishment and operation of marine parks.

1. Introduction

In 2009, the SA Government established 19 marine parks covering approximately 44 per cent of the State's waters. The Government has prepared a draft management plan for each of South Australia's marine parks. These draft management plans include a number of proposed zones where certain activities will be restricted for biodiversity conservation purposes. Global scientific research is demonstrating that marine parks have the potential to conserve coastal and marine biodiversity (PISCO 2007).

However, it is recognised that the zoning of marine parks will come with some costs such as restrictions on commercial and recreational activities. The *Marine Parks Act 2007* provides that when the Minister prepares a draft management plan, an impact statement of the expected environmental, economic and social impacts of the management plan must also be prepared. The impact statements are designed to assist the community to understand the projected impacts of the draft management plans¹ during public consultation.

The Department of Environment, Water and Natural Resources (DEWNR) contracted EconSearch Pty Ltd and its project partners to provide:

1. Impact statements for each of the 19 marine parks which describe both positive and negative impacts of implementing the draft management plans on the local marine ecosystems, economies and communities. These impact statements are to comply with the SA Government's Regional Impact Assessment Statement Policy (RIAS) and with Section 14(4)(c) of the Marine Parks Act 2007.
2. A state level Cost Benefit Analysis (CBA) of the proposed management of the 19 marine parks through zoning regulations. The CBA is to comply with the SA Governments Regulatory Impact Statement (RIS) Policy, but is not a RIS in its own right. The results of the CBA are presented in the Marine Park Impact Statements Main Report.

1.1 Marine Park Planning Process

Marine parks in South Australia will be zoned for multiple-uses, providing for varying levels of conservation, recreational and commercial use. Zoning provides the basis for the management of marine parks, in accordance with the objects of the *Marine Parks Act 2007*. Figure 1–1 describes the marine park zones.

The Government has developed a table of activities and uses that occur in the marine environment and summarises how these activities are expected to be managed in each marine park zone. The prohibitions and restrictions in the matrix will be included in regulations that will be finalised when marine park management plans are adopted (see Appendix 2).

¹ The impact statements were prepared before the draft management plans were finalised.

Figure 1–1 Marine Park Zones

<i>The management plans will contain the following management zones:</i>	
General managed use	A zone primarily established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing ecologically sustainable development and use.
Habitat protection	A zone primarily established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing activities and uses that do not harm habitats or the functioning of ecosystems.
Sanctuary	A zone primarily established so that an area may be managed to provide protection and conservation for habitats and biodiversity within a marine park, especially by prohibiting the removal or harm of plants, animals or marine products.
Restricted access	A zone primarily established so that an area may be managed by limiting access to the area.
<i>To accommodate site specific community needs, within a marine park there may be:</i>	
Special purpose area	An area within a marine park, identified as a special purpose area and with boundaries defined by the management plan for the marine park, in which specified activities, that would otherwise be prohibited or restricted as a consequence of the zoning of the area, will be permitted under the terms of the management plan.

Source: Adapted from sections 4 and 5, *Marine Parks Act 2007*.

The suite of protection provided by this framework will assist with the delivery of the objects of the *Marine Parks Act 2007*. Specifically:

- a) “to protect and conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive, adequate and representative system of marine parks; and
- b) to assist in—
 - i. the maintenance of ecological processes in the marine environment;
 - ii. the adaptation to the impacts of climate change in the marine environment;
 - iii. protecting and conserving features of natural or cultural heritage significance;
 - iv. allowing ecologically sustainable development and use of marine environments; and
 - v. providing opportunities for public appreciation, education, understanding and enjoyment of marine environments.”

The Government dedicated significant resources to gathering environmental, economic and social knowledge and working with community and key stakeholder interests to develop draft park zoning. Key elements of this process are described in Table 1-1

Table 1-1 Public consultation process to date

Initiative	Timeframe
Statewide consultation on Liberal Government draft policy document <i>Marine protected areas: a shared vision</i> . 23 public meetings/information sessions held involving some 1600 people.	2001/02
Labor Government policy <i>Blueprint for the SA representative system of marine protected areas</i> developed following the above consultation process, with further consultation undertaken with key stakeholders and across relevant government agencies.	2003/04
The Draft <i>Encounter Marine Park Zoning Plan</i> was released for 3 months' public consultation as a pilot process to test key concepts for statewide application. 427 submissions were received. Local consultation was undertaken targeting the Fleurieu Peninsula, Kangaroo Island and Adelaide. 15 public information days and 48 stakeholder group meetings were held.	2005
The Marine Parks Draft Bill (2006) was developed and 3 months' statewide consultation was undertaken on this, involving 16 regional public meetings/information sessions and 112 submissions.	2006-07
On 29 January 2009, the Minister for Environment and Conservation released the outer boundaries of 19 new marine parks, for a public consultation period of three months. During the comment period, approximately 15,000 copies of the consultation brochure with submission form were distributed through various means. By the end of the three month consultation 2,357 submissions had been received by the Department for Environment and Heritage (DEH) representing a total of 3, 295 individual respondents. In addition, 56 public information days were held and 4,800 people were estimated to have been directly engaged in the consultation process. Nearly 150 groups provided comment on either the marine parks network or one or more individual marine parks. These included key interest groups, organisations, businesses, associated bodies, local governments, not for profit organisations, community groups and recreational clubs. Three regional Pilot Working Groups with multi sectoral representation were established to advise on outer boundary design with minimum three meetings of each. Outer boundaries of seven Parks were amended as a result of the consultation process.	2009
Phase 1 - Management planning for South Australia's marine parks network. A Statewide community engagement process was undertaken involving:	Late 2009 onwards
<ul style="list-style-type: none"> 13 Marine Park Local Advisory Groups (MPLAGs) established across the state, and the Great Australian Bight Marine Park Consultative Committee (GABMPCC). 67 public MPLAG meetings were facilitated. Peak stakeholders were invited to provide early advice on their preferred zoning for marine parks. A key stakeholder forum was held where broad agreement was reached on the priority areas for conservation 	April 2012

Source: Adapted from SA Government Submission to the Marine Parks Select Committee, 2011.

The Scientific Working Group and Marine Parks Council of South Australia are independent advisory bodies providing advice to the Minister. In finalising draft management plans for public consultation, both the Scientific Working Group and Marine Parks Council assessed the merits of the draft zoning schemes and strategies for management against the objects of the *Marine Parks Act 2007* and provided the Minister with independent advice.

In finalising draft management plans, discussions were held with members of the Marine Parks Steering Committee as representatives of relevant Government agencies. The Steering Committee considered whether draft management plans took appropriate consideration of all relevant statutory requirements and effectively implemented the Government's policy commitments for marine parks.

Based on the collective advice from MPLAGs, other community members, peak stakeholders and discussions across relevant agencies, the Government developed a

draft management plan with zoning for each of the 19 marine parks for formal public consultation. The draft management plans are currently out for public consultation.

1.2 Policy Commitments

The Government has made a range of policy commitments² to help ensure South Australian lifestyles and livelihoods are maintained, and to provide more certainty for the industries that use the marine environment. The commitments informed the design of zoning for each marine park, and include:

- access to specific key recreational and commercial fishing sites through appropriate zoning
- access for existing and future aquaculture development through appropriate zoning
- certainty that marine parks will not affect access to, or use of, jetties, break walls or boat ramps
- accommodation of approved coastal development as well as future development and infrastructure needs
- accommodation of approved mining, petroleum and geothermal development activities
- accommodation of shipping and harbor activities
- certainty that marine parks will not create an extra approval process as government agencies will work together to streamline administration.

1.2.1 Displaced Commercial Fishing Policy Framework

The adoption of marine park management plans with zoning will displace some commercial fishing activities. This Policy Framework³ describes the steps that support this process:

1. Avoid displacement by pragmatic zoning;
2. Redistribute effort only where possible without impacting ecological or economic sustainability of the fishery;
3. Market-based buy back of sufficient effort to avoid impact on the fishery;
4. Compulsory acquisition as a last resort option.

The Government expects that market based buy back of effort and any necessary compulsory acquisition will be undertaken under the authority of the Minister for Agriculture, Food and Fisheries. The Minister for Sustainability, Environment and Conservation will consider any fair and reasonable compensation in accordance with section 21 of the *Marine Parks Act 2007*, and it is envisaged that regulations will be drafted to support this process.

² A complete list of the commitments is available at Appendix 2 of the *South Australia's Marine Parks Network Explanatory Document* which accompanies the draft management plans.

³ The Displaced Commercial Fishing Policy Framework is provided at Appendix 5 of the *South Australia's Marine Parks Network Explanatory Document*.

2. Method of Assessment

This study undertook both an impact analysis and an economic evaluation, in the form of a cost benefit analysis (CBA), of implementing the marine park draft management plans. The method and results of the CBA are presented in the Main Report.

Impacts of implementing the draft management plans were assessed against a base case scenario of no management plans. This also applies to the CBA. The base case is not static, and requires an understanding of the existing trends in natural resource, economic and social conditions. There are external factors which influence both the 'with management plan' and the base case scenarios that need to be taken into consideration.

2.1 Ecological

The ecological impact assessment was required to:

1. describe the current status of the marine habitats, plants and animals in each marine park;
2. discuss (in qualitative terms) the services that the protected ecosystems provide to South Australians (where not possible to measure their economic value);
3. identify the range of activities that impact on the environment and quantify how the draft management plans will influence the marine environment, against a base case of no management plans;
4. assess the implications of the management plans in 5, 10 and 20 years on species diversity and abundance, marine habitats, and ecosystem function;
5. include case studies that highlight the potential impacts of the draft management plans on iconic and threatened species and contribute to case studies that effectively communicate the trade-offs between the different environmental, social and economic factors.

The outcomes for Items 1, 4 and 5 listed above are included in each individual park statement and can be found in Section 4 of this impact statement. The outcomes for Item 2 are generic across the park network and are briefly introduced in Section 3.1 of this impact statement and detailed in Appendix 4 of the Main Report (see Ecosystem services). The outcomes for Item 3 inform the outcomes for Items 4 and 5, and are discussed in a generic sense in Appendix 1.1.4 of the Main Report. It should be noted that despite the broad spectrum of activities that can potentially be influenced by zoning under the *Marine Parks Act 2007*, the proposed zones have been located in such a manner that very few current activities will be affected. The most widespread of these is fishing, with the cessation of all forms of fishing inside most SZs and RAZs (with exceptions relating to existing restrictions), and benthic trawling inside HPZs of six parks. Furthermore, predicting species and ecosystem responses to the cessation of fishing is highly complex (see Appendix 1.3 of the Main Report) and, compared to other activities, there are generally more data available to inform the assessment. Consequently, the extent and depth of discussion on fishing-related responses may appear to be disproportionate in comparison to other activities, but this is not intended to place any particular emphasis on fishing as a threatening process.

The process of ecological impact assessment undertaken for the current report can essentially be summarised by three main steps:

1. Activities and uses: determining the range of activities and uses that potentially impact on the marine environment under current management regimes, and then determining how the marine park zoning and management arrangements will influence them.
2. Baseline: determining the current status of the marine species, habitats, and ecosystems in the marine parks; what are we comparing future changes against?
3. Predictions: assessing the implications of the marine park zoning and management arrangements in 5, 10 and 20 years on species, habitats, and ecosystems against the case of no marine park zoning and management arrangements.

A total of 205 species or species groups, 11 habitat types, and 11 habitat-based ecosystem types were selected for the impact assessment (see Appendices 2, 4 and 6 of the Main Report).

Further details of the methodology can be found in Appendix 1 of the Main Report.

2.2 Economic

At a regional level, the economic impact analysis was based on the input-output method. This method provides a standard approach for the estimation of the economic impact of a particular activity. The input-output model is used to calculate industry multipliers that can then be applied to various change scenarios, as has been done in this study.

For this impact assessment an input-output model was constructed specifically for the Fleurieu and Coorong region (see Map in Appendix 1). The model is known as a Regional Industry Structure and Employment (RISE) model which is an extension of the standard input-output model that is used within the SA Government for various types of impact assessment.

At a micro level individual businesses could be impacted by marine parks. To assess the impact on commercial fishing operations representative financial models of fishing businesses were constructed for each of the relevant fishing sectors. These models were based on financial information collected and reported by EconSearch (2010) over the past 13 years. The results of the financial modelling provided input into the regional RISE model to estimate impacts on the regional economy.

The principal driver for change in fishing industry operations and profitability is lost access to the resource. Estimates of displaced catch were provided by the South Australian Research and Development Institute (SARDI). PIRSA Fisheries and Aquaculture provided detailed information on the recreational and commercial fisheries relating to the:

- current condition of the fishery;
- outlook for the fishery without marine parks management plans;
- marine parks impacts on the fishery; and
- measures to mitigate anticipated impacts.

Discussions were also held with representatives of each of the commercial fishing sectors, recreational fishing, mining, various State Government departments and Local

Government (see Appendix 3). These discussions provided insights to the likely responses of businesses and organisations associated with or members of the interviewee's organisation. Because of time and resource constraints it was not possible to undertake discussions with or collect data from all potentially impacted parties.

Because some of the activities that could potentially be impacted by marine parks are related to the tourism sector, the Fleurieu and Coorong RISE model includes explicit specification of the regional tourism industry. This was done by following the standard ABS method of constructing tourism satellite accounts.

The following indicators of economic impact were generated using the economic modelling framework described above:

- value of output,
- gross regional product (GRP),
- household income and
- employment.

(Value of) Output is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. the value of processed seafood products) and gross expenditure by government agencies. Total output needs to be used with care as it can include elements of double counting when the output of integrated industries is added together (e.g. the value of processed seafood includes the beach value of the fish).

Gross regional product (GRP) is a measure of the net contribution of an activity to the regional economy. GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, 'gross operating surplus and gross mixed income net of payments to owner managers' and 'taxes less subsidies on products and production'. It represents payments to the primary inputs of production (labour, capital and land). Using GRP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.

Household income is a component of GRP and is a measure of wages and salaries paid in cash and in-kind, drawings by owner operators and other payments to labour including overtime payments, employer's superannuation contributions and income tax, but excluding payroll tax.

Employment is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalent (fte) jobs. Employment is measured by place of remuneration rather than place of residence.

Further details of the economic method can be found in Section 3.2 of the Main Report.

2.3 Social

The identification of potential social impacts of different marine park zoning options has been informed by a review of relevant research, analysis of the Environmental, Economic and Social Values Statements developed for each park, a review of the minutes and available correspondence of Marine Parks Local Advisory Groups (MPLAG), an overview of local media reports on the parks, an examination of market research on community perspectives on the establishment of marine parks, an

assessment of MPLAG member perspectives on zoning options and targeted impact assessment interviews. An analysis of SAMPIT⁴ data was also undertaken to identify the potential impact of the zoning proposal on recreational fishing. An examination of the impacts of the establishment of marine parks in relevant jurisdictions was undertaken to inform the design of the social impact assessment tool.

A 'Marine Parks Social Impact Assessment Tool' (MPSIAT) was developed by the Australian Institute for Social Research to identify and compare potential social impacts from the preliminary DEWNR marine park sanctuary zones (DEWNR zones) and zones resulting from Marine Park Local Advisory Groups advice (MPLAG zones). MPSIAT respondents provided perspectives on impacts of zoning proposals based on their experience and expertise. Final MPLAG zone advice was normally based on a majority view. While this approach to decision making delivers a decision it does tend to obscure differences in views and opposing views on potential impacts from the perspectives of different stakeholders. The MPSIAT has been designed to shed light on these differences in order to identify a range of potential social impacts identified by key stakeholders. In the context of the impact assessment process these perspectives can inform our understanding of what the social impacts of the draft zoning proposal are likely to be. This impact assessment statement helps to identify what the likely social impacts will be.

This social impact assessment provides baseline perspectives on potential positive and negative impacts across five domains:

- Education and wellbeing;
- Culture and heritage;
- Recreation and fishing;
- Population and housing; and
- Community.

Social vulnerability of the Impact Region associated with each Marine Park has been determined through a combination of Socio-Economic Indexes for Areas (SEIFA) indexes, population (health, family, education, Indigenous status) and economic characteristics (unemployment, job losses).

The SEIFA Indexes presented here provide a measure of the socio-economic disadvantage for the Impact Regions associated with Marine Parks at the time of the 2006 Census⁵. We have included figures from the *Index of Relative Socio-economic Disadvantage*, the *Index of Economic Resources* and the *Index of Education and Occupation*. Each of these provides a slightly different view of the socio-economic profile and potential vulnerability of each region.

⁴ The South Australian Marine Parks Information Tool (SAMPIT) is a computer tool designed to gather information from community members about their favourite fishing spots and areas they believe need protection. Data is collected and reported by 'grid cell'. SAMPIT data for 1,739 people is available including 1311 recreational fishers. Quality control by the Department of Environment and Natural Resources included cross-verification of legitimate naming and activities from the data provided (DENR 2010b).

⁵ Australian Bureau of Statistics. 2008. *Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia - Data only 2006 (cat. no. 2033.0.55.001)* and *Information Paper: An Introduction to Socio-Economic Indexes for Areas (SEIFA), 2006 (cat. no. 2039.0)*. Note SEIFA Indexes for the 2011 Census are not yet available.

SEIFA values have been standardised with Australia (as a whole) having a value of 1000 and a standard deviation of 100, low scores indicate greater disadvantage. South Australia sits below the Australian average with a relative disadvantage level of 979. At the SLA level, South Australian SEIFA relative disadvantage scores range from a low of 527 through to 1107.

A range of SEIFA values at the statistical local areas (SLA) level are associated with the Impact Regions, noting between one and seven SLAs are associated with each Impact Region. These capture information about average socio-economic conditions for the SLA and Impact Region but do not account for variation of individuals within the areas. Areas identified with relative disadvantage may well have individuals and sub-regions that are relatively advantaged. We have also presented individual variables to provide additional information about the potential social vulnerability of SLAs associated with the Impact Regions.

Where an Impact Region has an SLA falling within the top decile in South Australia (i.e. most disadvantaged) a ranking of *High* is provided. A ranking in the second highest decile is ranked as *Moderate*. Where there are moderate to high ranking SLAs they are rated to as *Moderate-High*.

It is important to acknowledge that the impact of marine parks on employment and wellbeing is likely to vary significantly across regions and will be mediated by a range of social and economic factors including:

- the age and retirement intentions of fishers;
- the ability of fishers to adapt to changes within the region in which they fish;
- the opportunities available to fishers and those dependent on fishers to work in other industry sectors;
- the impact of compensation packages provided to fishers on their financial circumstances and the local economy;
- the influence of lifestyle attachment and importance of place in the lives of fishers
- the extent to which the existence of marine parks might generate employment in tourism, research, education and other sectors.

3. Encounter Marine Park Description

Covering approximately 3,119 km², the Encounter Marine Park straddles the transition between the Gulf St Vincent and Coorong Bioregions. It encompasses waters off southern metropolitan Adelaide and the Fleurieu Peninsula, extending past the Murray Mouth to the Coorong coast. At its western boundary, the marine park includes all waters of Backstairs Passage and the eastern shores of Kangaroo Island. This marine park partially or completely overlays a number of other protected areas, including the Coorong National Park; Beatrice Islet, Busby Islet, Cape Willoughby, Deep Creek, Baudin, Lashmar, Newland Head, Pelican Lagoon, Pullen Island, West Island and the Pages Islands Conservation Parks; and Granite Island Recreation Park. The marine park also borders Nepean Bay Conservation Park, Moana Sands Conservation Park and Onkaparinga River Recreation Park. The Aldinga Reef and Port Noarlunga Aquatic Reserves are overlaid by the marine park (DENR, 2010a).

A map of the Encounter Marine Park and the proposed draft zoning is provided at the end of this statement at Appendix 5.

3.1 Ecological Description

The park contains a range of ecosystems, including major estuaries, gulf waters, exposed coasts and sheltered bays, shaped by a wide variety of physical influences (DENR, 2010a).

The gulf-facing coast of the southern Fleurieu Peninsula is characterised by large, open beaches backed by cliff or dunes, generally shallow waters, with input from the Onkaparinga River and many small estuaries. Subtidal habitats include a variety of reef forms and extensive seagrass beds. The southern coast is diverse, with sheltered and exposed beaches, intertidal platform reef, offshore platform and granitic boulder reefs and extensive sandy seafloor habitats and seagrass beds and limestone reef in Encounter Bay, amongst granite islands (DENR, 2010a).

Backstairs Passage includes a range of habitats extending from cliffs and headlands of Dudley Peninsula into a deep submarine trench, up to 80 metres deep, lined with large sponges and other invertebrates. The Pages is a group of granitic islands surrounded by fringing reef (DENR, 2010a).

The Coorong coast contains part of one of Australia's longest continual sandy beaches, and is strongly influenced by the Murray Mouth and connectivity with the Coorong Lagoon which supports a diverse range of aquatic and terrestrial plants and animals (DENR, 2010a).

On Kangaroo Island, there are extensive and dense seagrass meadows to the east (Antechamber Bay), and large areas of seagrass, sandy seafloor habitat and shallow reefs in sheltered bays to the west, and the semi-enclosed Pelican Lagoon which supports a range of reef, seagrass, sponge and sandy seafloor communities (DENR, 2010a, Kinloch et al., 2007).

For the current impact assessment, coastal and marine habitats/ecosystems were divided into the following types: saltmarsh, mangrove, intertidal sand flat, subtidal sand, intertidal seagrass flat, subtidal seagrass, intertidal reef, subtidal high profile reef, subtidal low profile reef, beach, and pelagic. The extent of these habitats (except pelagic) mapped for this park are shown in Table 3-1.

Table 3-1 Summary of habitats

Zone	Shoreline habitats (km of coastline)						Benthic habitats (km ²)				
	Beach	Intertidal sand	Intertidal seagrass	Intertidal reef	Mangrove	Saltmarsh	Subtidal high profile reef	Subtidal low profile reef	Subtidal sand	Subtidal seagrass	Unmapped
RAZ-1									0.1	0	
RAZ-4							0		0	0	
SZ-2	2.9 (2.9)						0.5	0	1.6	2.4	2.8
SZ-3	2.6						3.2		0.9	0.2	18.1
SZ-4	0			5.3			1.3		5.5	0.2	1.3
SZ-5				4.5			1.1	0.6	6.2	4.4	43.1
SZ-6	2.9 (2.1)			1.2			11.6		4.4	0.1	12.6
SZ-7	4										22.6
SZ-8	13.8					0.3			4.7	20.8	0.2
SZ-9			30.1				0		0.6	14.1	0.5
SZ-10				8.9			2		24.3		33.6
SZ-11											42
HPZ-1	12.6			0.6			6.7	0.4	11.1	4.8	70.4
HPZ-2							0	0	0		
HPZ-3									0		
HPZ-5	64.1	7.1		71.6		3.3	28.4	18.6	220.6	208	966.1
HPZ-6	44.4			6			22.2		23.4	5.6	343.5
GMUZ-1											21.1
GMUZ-2											403.3
GMUZ-3	0.3			0.2			0		0.1	0.3	
GMUZ-4	2.1			0.1			0		0.2	2.3	
GMUZ-5	27.6		1.8	19.5		2.4	2.6	8.1	120.7	58.8	15.7
GMUZ-6	5.1			13.2			5.3	3	13.2		111.6
GMUZ-7	18.3										88.7
Total	200.7	7.1	31.9	131.1		5.9	84.9	30.5	437.5	321.9	2197

Source: based on GIS data provided by DEWNR.

Zones are labelled as shown in Appendix Figure 5–1. Land-based RAZs have been omitted from this table.

Shoreline habitats are not available for islands. Intertidal habitats are expressed as shoreline lengths to be consistent with DENR (2010a), and/or because of limitations of the available GIS data, and therefore do not provide a complete indication of the extent of these habitats within the park. Brackets indicate the length of shoreline habitat within an SZ along which shore-based line fishing is allowed.

Zero values indicate presence but <0.05 km/km². Totals may differ slightly from column sums due to rounding.

These eleven habitats/ecosystems, and others not considered in the current impact assessment, support thousands of species (Edyvane, 1999; Baker, 2004). They also offer goods and services that are of economic, social and environmental value to SA. The economic value of these services can be difficult to determine but to illustrate the importance of valuing coastal marine habitats in SA a description of the necessary goods and services that need to be taken into account is provided. The goods and services provided by coastal, marine and estuarine habitats were classified under four headings by McLeod and Leslie (2009). These headings were:

- Life supporting services,

- Resources and products,
- Maintaining Earth's living space and
- Recreational and cultural services.

Each one of these headings was divided into categories that could be more easily valued, either directly or as a service. A more detailed discussion of these goods and services is provided in Appendices 4 (habitat specific information) and 5 (consolidated discussion) of the Main Report.

3.2 Socio-economic Profile

From a socio-economic viewpoint the communities relevant to the Encounter Marine Park are those of the Fleurieu and Coorong region and Kangaroo Island. The socio-economic profile provided in Appendix 1 presents a statistical summary of key economic and social information for the Fleurieu and Coorong region and, where possible, South Australia (SA). The profile brings together a wide range of existing Australian Bureau of Statistics (ABS) data and some non-ABS data. It has been designed, at a broad level, to aid understanding of the economic and social structure of the region, to indicate how the Fleurieu and Coorong region contributes to the State economy and to illustrate trends in economic growth or decline. A similar profile is also provided for Kangaroo Island.

The Fleurieu and Coorong region is located south of Adelaide (Figure 1, Appendix 1). The six statistical local areas (SLAs) that comprise the region are Onkaparinga (C) – North Coast, Onkaparinga (C) – South Coast, Alexandrina (DC) – Coastal, Yankalilla (DC), Victor Harbor (C) and The Coorong (DC). The Fleurieu and Coorong regional economy is relevant to the Encounter Marine Park (MP15). Table 3-2 presents a summary of the key economic and social information detailed further in Appendix 1.

Some key points from the detailed socio-economic profile in Appendix 1 are as follows:

- The estimated resident population of the Fleurieu & Coorong was almost 90,000 persons in 2010/11.
- Compared with the age distribution of the state as a whole, the Fleurieu & Coorong region has a similar concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and, consequently, a higher than average share of people aged 65 and over.
- The total population in the Fleurieu & Coorong region is projected to increase by almost 56 per cent by 2026, whereas the SA population is expected to increase by less than half of that, around 23 per cent.
- The unemployment rate in the Fleurieu & Coorong region was 8.1 per cent in the June quarter of 2011, well above the state rate.
- Over 60 per cent of the businesses operating in the Fleurieu & Coorong region did not employ anyone and 20 per cent employed between 1 and 4 people.
- Over the period 2000/01 to 2009/10, the mean taxable income (in nominal terms) increased by 59 per cent in the Fleurieu & Coorong region (\$47,400 in 2009/10) and 54 per cent in SA as a whole (\$54,350 in 2009/10).

- Median dwelling (units and houses) prices increased by 209 per cent in the Fleurieu & Coorong region (\$326,250 in 2010/11) and 197 per cent in SA as a whole (\$357,500 in 2010/11) over the period 2000/01 to 2010/11.
- In 2009/10, the top four contributors to total jobs in the region were the retail trade (19 per cent each), manufacturing (16 per cent), health and community services (13 per cent) and building and construction (8 per cent) sectors.
- In 2009/10, the top four contributors to GRP were the manufacturing (14 per cent), ownership of dwellings (13 per cent), agriculture, forestry and fishing and building and construction (8 per cent each) sectors.
- The commercial fishing and tourism industries are important to the local economy in terms of contributing to jobs and GRP. Directly and indirectly commercial fishing and aquaculture contributed 0.3 per cent of GRP (\$7.3 million) and 0.3 per cent of employment (86 jobs) in 2009/10. By comparison, the tourism sector contributed 6 per cent of GRP (\$135.3 million) and 8 per cent of employment (2,160 fte jobs).

Table 3-2 Summary of key economic and social indicators for the Fleurieu & Coorong region

Indicator	Fleurieu & Coorong	SA	Fleurieu & Coorong as a proportion of SA
Population, 2010/11 (no.)	89,980	1,656,299	5.4%
Birth Rate, 2009/10 (births/1000 residents)	12.3	12.2	-
Death Rate, 2009/10 (deaths/1000 residents)	8.6	7.9	-
Age Distribution, 2009/10:			
Proportion of Population aged 0-14	18%	18%	-
Proportion of Population aged 15-64	62%	67%	-
Proportion of Population aged 65+	20%	16%	-
Dependency Rate, 2009/10:			
Child	28%	27%	-
Aged	32%	23%	-
Total	60%	50%	-
Population Projection, Increase from 2006 to 2026	56%	23%	-
Employment, June qtr 2011:			
Labour Force (no.)	38,783	867,500	4.5%
Unemployed (no.)	3,140	45,300	6.9%
Unemployment Rate	8%	5%	-
Participation Rate, 2009/10	53%	63%	-
Businesses, June 2009 (no.)	5,735	141,625	4.0%
School Enrollments, 2011	13,196	247,356	5.3%
Tertiary Enrollments, 2011	9,612	208,706	4.6%
Non-school Qualifications, 2006	26,225	595,379	4.4%
Mean Taxable Income, 2009/10 (\$)	47,368	54,349	-
Proportion of Taxable Individuals, 2009/10	67%	74%	-
Value per Building Approval, 2010/11 (\$)	210,136	236,269	-
Median Dwelling Price, 2010/11 (\$)	326,250	357,500	-
Commercial Fishing, Ave/yr 2000/01 to 2009/10:			
Catch (t)	2,459	47,581	5.2%
Value of Catch (\$m)	10	202	4.8%
Charter Boats, Ave/yr 2007/08 to 2009/10 (no. of fish)	26,066	146,341	17.8%
Recreational Fishing, 2007/08:			
Fishers (no.)	47,777	236,463	20.2%
Days Fished (no.)	130,146	1,054,200	12.3%
Gross Regional Product, 2009/10 (\$m)	2,464	80,356	3.1%
Employment, 2009/10 (fte)	28,789	774,953	3.7%
Tourism, 2009/10 (\$m)	260	4,524	5.7%
Other Regional Exports, 2009/10 (\$m)	1,060	26,757	4.0%
Regional Imports, 2009/10 (\$m)	2,300	40,573	5.7%

Source: Appendix 1.

Kangaroo Island is located south-west of Adelaide (Figure 1, Appendix 1). The one statistical local area (SLA) that comprises the region is Kangaroo Island (DC). The Kangaroo Island regional economy is relevant to the Encounter Marine Park (MP15) as well as the Southern Spencer Gulf (MP12), Western Kangaroo Island (MP16), and Southern Kangaroo Island (MP17) marine parks. Table 3-3 presents a summary of the key economic and social information detailed further in Appendix 1.

Some key points from the detailed socio-economic profile in Appendix 1 are as follows:

- The estimated resident population of Kangaroo Island was almost 4,700 persons in 2010/11.
- Compared with the age distribution of the state as a whole, Kangaroo Island has a slightly higher than average concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and a similar share of people aged 65 and over.
- The total population on Kangaroo Island is projected to increase by around 20 per cent by 2026 and the SA population is expected to increase by a similar amount, approximately 23 per cent.
- The unemployment rate on Kangaroo Island was almost 3.9 per cent in the June quarter of 2011, below the state rate.
- Of the 687 businesses operating on Kangaroo Island, over 50 per cent were classified in the agriculture, forestry and fishing sector and 10 per cent were in the construction sector.
- Over the period 2000/01 to 2009/10, the mean taxable income (in nominal terms) increased by 48 per cent on Kangaroo Island (\$43,900 in 2009/10) and 54 per cent in SA as a whole (\$54,350 in 2009/10).
- Median dwelling (units and houses) prices increased by 176 per cent on Kangaroo Island (\$235,000 in 2010/11) and 197 per cent in SA as a whole (\$357,500 in 2010/11) over the period 2000/01 to 2010/11.
- In 2009/10, the top four contributors to total jobs in the region were the agriculture forestry and fishing (22 per cent), retail trade and accommodation, restaurants and cafes (both 14 per cent) and health and community services (8 per cent) sectors.
- In 2009/10, the top contributors to GRP were the agriculture, forestry and fishing (20 per cent), transport and storage (10 per cent), ownership of dwellings (9 per cent), and accommodation, cafes and restaurants (8 per cent) sectors.
- The commercial fishing and tourism industries are important to the local economy in terms of contributing to jobs and GRP. Directly and indirectly commercial fishing and aquaculture contributed 3 per cent of GRP (\$4.7 million) and 3 per cent of employment (74 fte jobs) in 2009/10. By comparison, the tourism sector contributed 38 per cent of GRP (\$62.0 million) and 43 per cent of employment (960 fte jobs).

Table 3-3 Summary of key economic and social indicators for Kangaroo Island

Indicator	Kangaroo Island	SA	Kangaroo Island as a proportion of SA
Population, 2010/11 (no.)	4,666	1,656,299	0.3%
Birth Rate, 2009/10 (births/1000 residents)	11.8	12.2	-
Death Rate, 2009/10 (deaths/1000 residents)	6.9	7.9	-
Age Distribution, 2009/10:			
Proportion of Population aged 0-14	19%	18%	-
Proportion of Population aged 15-64	65%	67%	-
Proportion of Population aged 65+	16%	16%	-
Dependency Rate, 2009/10:			
Child	29%	27%	-
Aged	24%	23%	-
Total	54%	50%	-
Population Projection, Increase from 2006 to 2026	20%	23%	-
Employment, June qtr 2011:			
Labour Force (no.)	2,678	867,500	0.3%
Unemployed (no.)	105	45,300	0.2%
Unemployment Rate	4%	5%	-
Participation Rate, 2009/10	69%	63%	-
Businesses, June 2009 (no.)	687	141,625	0.5%
School Enrollments, 2011	620	247,356	0.3%
Tertiary Enrollments, 2011	411	208,706	0.2%
Non-school Qualifications, 2006	838	595,379	0.1%
Mean Taxable Income, 2009/10 (\$)	43,766	54,349	-
Proportion of Taxable Individuals, 2009/10	64%	74%	-
Value per Building Approval, 2010/11 (\$)	255,153	236,269	-
Median Dwelling Price, 2010/11 (\$)	235,000	357,500	-
Commercial Fishing, Ave/yr 2000/01 to 2009/10:			
Catch (t)	1,407	47,581	3.0%
Value of Catch (\$m)	10	202	5.0%
Charter Boats, Ave/yr 2007/08 to 2009/10 (no. of fish)	20,333	146,341	13.9%
Recreational Fishing, 2007/08:			
Fishers (no.)	11,190	236,463	4.7%
Days Fished (no.)	32,743	1,054,200	3.1%
Gross Regional Product, 2009/10 (\$m)	161	80,356	0.2%
Employment, 2009/10 (fte)	2,262	774,953	0.3%
Tourism, 2009/10 (\$m)	121	4,524	2.7%
Other Regional Exports, 2009/10 (\$m)	93	26,757	0.3%
Regional Imports, 2009/10 (\$m)	235	40,573	0.6%

Source: Appendix 1.

4. Summary of Impacts

4.1 Ecological

This section presents the summarised results of the ecological impact assessment for this particular park. As such, output tables and other information presented that are not otherwise referenced, represent the professional judgement of the authors. Full details behind the assessments can be found in the Main Report and accompanying appendices (see cross-references below).

4.1.1 Habitats

In general the habitats within the park can be considered to be in a condition comparable to the time of European settlement. However, habitat impacts, mainly adjacent to the southern suburbs of Adelaide and regional centres such as Victor Harbor and Kingscote e.g. seagrass loss, reef degradation or potentially damaging practices e.g. effluent discharge, agricultural run-off, have been documented in some cases (e.g. Bryars, 2003; Bryars et al., 2003; Connell et al., 2008; Shepherd et al., 2008). Potential water quality issues have been identified with discharges from the Hindmarsh and Inman River estuaries into Encounter Bay (Sinclair Knight Merz, 2010a, b).

Habitat changes attributed to prawn trawling have been documented in Gulf St Vincent (Tanner, 2005; see Appendix 1.1.5 of the Main Report) and habitat response to cessation of prawn trawling is likely to occur in areas within zones (SZ-5, HPZ-1 and HPZ-5) that have been trawled previously (Ward and Burch, 2012). These areas are likely to experience an increase in cover of the benthic species that characterise the subtidal sand habitat (see Table 4–1). However, there is also potential for degradation of subtidal sand habitat outside these zones through redistribution of prawn fishing effort previously undertaken within them.

Other documented cases of anthropogenic habitat change that are known to be inside SZs or HPZs are also shown in Table 4–1.

Table 4–1 Predicted habitat responses to zoning

Habitat	Zones	Current status	Potential response after 5, 10 and 20 years					Notes
			Measure	Scenario	5	10	20	
Reef	SZ-2, SZ-3, HPZ-1	NL	Area	With Zoning	0	0	0	Previous degradation of some reefs and ongoing land-based human activities in the region may not be positively influenced by the management plan
		UNLL	Cover	With Zoning	0	0	0	
		NL	Area	Without Zoning	0	0	0	
		UNLL	Cover	Without Zoning	0	0	0	
		NL	Area	Net effect of Zoning	0	0	0	
		UNLL	Cover	Net effect of Zoning	0	0	0	
Seagrass	HPZ-5 (within Western Cove)	UNLL	Area	With Zoning	0	0	0	Previous seagrass loss in Western Cove and ongoing land-based human activities may not be positively influenced by the management plan
		UNLL	Cover	With Zoning	0	0	0	
		UNLL	Area	Without Zoning	0	0	0	
		UNLL	Cover	Without Zoning	0	0	0	
		UNLL	Area	Net effect of Zoning	0	0	0	
		UNLL	Cover	Net effect of Zoning	0	0	0	
Sand	SZ-5, HPZ-1, HPZ-5 (within Gulf St Vincent & Investigator Strait)	UNLL	Area	With Zoning	0	0	0	Probable loss of sessile benthic invertebrates due to prawn trawling in the area may recover following protection
		UNLL	Cover	With Zoning	+	++	+++	
		UNLL	Area	Without Zoning	0	0	0	
		UNLL	Cover	Without Zoning	-	-	-	
		UNLL	Area	Net effect of Zoning	0	0	0	
		UNLL	Cover	Net effect of Zoning	++	+++	++++	

The proposed zoning is not predicted to change the current status of the degraded reefs off southern Adelaide nor the degraded seagrass meadows in Western Cove on Kangaroo Island which require complementary management measures. However, the zoning plan will influence future activity in all zones and applies specific restrictions on future activity within HPZs, SZs and RAZs, with respectively increasing protection across this hierarchy of zone types (see Appendix 1.2.6 of the Main Report). The Encounter Marine Park has about 63 per cent and 10 per cent of the total park area designated as HPZ and SZ, respectively (and <0.1 per cent as RAZ).

A number of special purpose areas (harbor activities) have been proposed in areas including Kingscote, Penneshaw, and Victor Harbor, overlapping SZ-6, SZ-8 HPZ-5 and HPZ-6. An activity for the purposes of maintaining or improving a harbor or port (see Appendix 7 of the Main Report) that would normally be restricted within these zones may be able to occur subject to the provisions of the management plan. Similarly, a special purpose area (underwater cable) has been proposed through part of SZ-10 and HPZ-5. As the management plans were not available for this report, it is not possible to assess the extent to which habitats would be protected. It is nevertheless expected that the designation of areas worthy of zoning as SZs and HPZs would assist in directing future activities appropriately.

For the Encounter Marine Park some of the habitats of particular conservation note include (DENR, 2010a):

- the deep-sea sponge gardens in Backstairs Passage (SZ-10, HPZ-5)
- the only known beds in South Australia of *Heterozostera tasmanica* occur in Horseshoe Bay near Victor Harbor (HPZ-6)
- *Posidonia coriacea* beds off Aldinga Beach (HPZ-5)
- Wetlands of National Importance in the Onkaparinga Estuary (SZ-1, HPZ-3, HPZ-4), and Pelican Lagoon on Kangaroo Island (SZ-9).

4.1.2 Species

4.1.2.1 Threatened and protected species

A large number of marine species are protected in SA under either State and/or Federal legislation, including all syngnathids (seahorses, seadragons, pipefishes, pipehorses), all marine mammals and most seabirds. Some of these species are also listed as threatened species under either State and/or Federal legislation. It was beyond the scope of this impact statement to assess all of these species, but some of the species or species groups that were identified in the Ecosystem Food Webs (see Appendix 6 of the Main Report) and/or that are a key feature of this particular marine park are considered here. Each of these species is discussed in more detail in Appendix 3 of the Main Report.

The following species may benefit from maintenance and/or improvement of habitats and ecological processes within the park:

- Australian sea lion (threatened and protected species) (breeding sites at The Pages Islands)

- Southern right whale (threatened and protected species) (calving area in Encounter Bay)
- Little penguin (protected species) (breeding sites at Victor Harbor, Penneshaw, Kingscote)
- New Zealand fur seal (protected species)
- White shark (threatened and protected species) (aggregation area at The Pages Islands)
- Syngnathids including the leafy and weedy seadragon (protected species)
- Bottlenose and common dolphins (protected species)
- White-bellied sea eagle (threatened and protected species)
- Eastern osprey (threatened and protected species).

Changes in abundance of these species due to the introduction of the proposed management arrangements are not able to be predicted over the next 20 years due to the complexities of ecosystem interactions and/or a lack of data on current status and zone use. Listed threatened species often have individual recovery plans that identify objectives/actions required to mitigate against threatening processes that will ultimately allow recovery of the species. Protection of critical habitat is often identified in these plans as a useful objective, and thus the protection of breeding and aggregation areas under the proposed zoning arrangements should have some positive impact on the Australian sea lion, southern right whale, and white shark. However, it is unlikely that the main anthropogenic threatening processes to these species (or the white-bellied sea eagle and eastern osprey) will be out-weighed by any potential positive impact from the park zoning and management plan (see Species Profiles in Appendix 3 of the Main Report). Nonetheless, some of the zones of particular note for threatened and protected species within the Encounter Marine Park are:

- SZ-6 which includes the southern right whale calving area at Bashams Beach
- SZ-11 which includes the waters around the Australian sea lion breeding colony at North Page Island and which is a known aggregation area for the white shark
- RAZ-2 and RAZ-3 which encompass the Australian sea lion breeding colonies at North and South Page Islands
- SZ-10 which is adjacent to a white-bellied sea eagle territory
- SZ-2, SZ-3, SZ-4, SZ-5, SZ-10 and SZ-11 which include waters where the western blue groper occurs and is protected (see 4.1.2.2 and 4.1.4 below).

4.1.2.2 Fished species

South Australia's proposed system of marine parks was designed for biodiversity conservation purposes rather than as a fisheries management tool. Nevertheless, the impact assessment identified that species which are currently fished are most likely to show a direct first-order response over the next 20 years (relative to current uses) to the proposed management arrangements and zonings (see Appendix 1.3 of the Main Report). Therefore the assessment of the impact on 20 indicator fished species has

been provided in a specific section here. More detailed discussion on the rationale for selecting the indicator species, and their expected response to protection, can be found in Appendices 1.3.4 and 3 of the Main Report.

Commercial, recreational and charter fishing occurs within the park for a variety of species. The current status of some of the indicator species that were able to be assessed within various sanctuary zones of the park was considered to be at an unnaturally low level (UNLL) compared with a pre-European (pre-fishing) baseline (Table 4–2). A pre-fishing baseline rather than the current baseline is required to enable future predictions of change because the level of fishing activity prior to protection influences the response following protection (see Appendix 1 of the Main Report). The reduced levels of some species do not reflect poorly on fisheries management in accordance with the principles of ecologically sustainable development.

Predicting ecological responses to marine parks is inherently complex and depends on many factors (see Appendix 1.3.7 in the Main Report). In the few instances where it has been attempted, the actual changes have often been different to the predictions (Langlois and Ballantine, 2005). Nevertheless, as required for this assessment, some predictions have been attempted based on a number of assumptions listed in Appendix 1.3.13 of the Main Report. Each species is considered only in isolation and therefore interactions between species also need to be considered when interpreting the potential responses described below (see Section 4.1.3).

Table 4–2 summarises the outcomes of the predictive modelling that was undertaken on a subset of indicator species (see Appendix 1.3 of the Main Report for further details of the methodology, in particular the list of assumptions and limitations in Appendix 1.3.13). Using southern rock lobster as an example, Table 4–2 indicates that the current status of adult southern rock lobster is at UNLL in sanctuary zones SZ-4, SZ-5, SZ-6, SZ-10 and SZ-11, which all include reef habitat used by lobster. Under the proposed zoning, the adults and sub-adults already resident in these proposed sanctuary zones and any post-larval juveniles that then become residents (or recruits) would be protected. Consequently, the potential exists for the size and abundance of adults to increase within these zones after 5 years (shown as +), 10 years (shown as ++) and 20 years (shown as +++) (Table 4–2). Without the proposed zoning, adult lobsters would continue to be harvested and the population level was assumed to remain as it is today, as indicated by the zeros at 5, 10 and 20 years. Thus the predicted net effect of the proposed zoning shown in Table 4–2 is a positive increase within these zones across 5, 10 and 20 years⁶. Table 4–2 also shows for southern rock lobster that there is potential for: a spill-over as a result of the population density inside the SZs increasing relative to outside to the point where some lobsters will tend to migrate from the SZ; and increased larval production from inside the SZs due to increased lobster abundance and increased spawning. A similar scenario to southern rock lobster is also predicted for greenlip and blacklip abalone in the same zones (Table 4–2), except that spill-over is unlikely to occur because greenlip and blacklip abalone are highly sedentary (see Species Profile in Appendix 3 of the Main Report). In addition, second-order ecosystem interactions between blacklip abalone and higher order predators may limit their potential to increase (see Section 4.1.3). Density-dependent factors may also ultimately limit any potential increases in the size and abundance of sedentary species such as abalone that may have limited capacity to move out of an area (see Species Profiles in Appendix 3 of the Main Report).

⁶ Current management arrangements are aiming for a recovery of lobster populations in the Northern and Southern Zones. Nonetheless, the increase inside SZs would still be expected to be greater than outside, but the net effect of the SZs would be lowered.

For southern calamary in SZ-4, SZ-5, SZ-6, SZ-8, and SZ-10, there is potential for the size and abundance to be temporarily increased during spawning aggregations (as indicated by a + at each of 5, 10 and 20 years) with associated larval (hatchling) export (see Species Profile in Appendix 3 of the Main Report for further discussion). For transient species such as southern garfish and sub-adult King George whiting it is possible that in the absence of fishing their abundance will be temporarily increased during aggregation times inside SZ-8 (Bay of Shoals) and in these cases they are noted with a + for each of 5, 10 and 20 years, but there is not predicted to be a cumulative increase in abundance over time as individuals will eventually move out of the protected zone.

For several other species, similar predictions to southern rock lobster and greenlip/blacklip abalone are made with variations according to the particular zones and the life histories of each species (see Species Profiles in Appendix 3 of the Main Report for further details). Snapper and adult King George whiting have potential to increase in size and abundance inside many of the SZs (Table 4–2). Snapper populations often comprise a mix of migrant and resident individuals and there is evidence that some individuals become resident in the park region; it is these fish that are predicted to increase in abundance over time in the absence of fishing activity. The presence of the shipwreck ‘ex-HMAS Hobart’ may also enhance the long-term aggregation response of snapper inside SZ-5 (although a 0.5 nautical mile radius fishing exclusion zone already exists around the shipwreck). King George whiting are generally transient during the early part of their life but there is evidence that some adult fish are resident in the park region; it is these fish that are predicted to increase in abundance over time in the absence of fishing activity. Within the inshore SZ of Bay of Shoals (SZ-8) on Kangaroo Island, razorfish and mud cockle might be expected to increase in size and abundance, with larval export also possible. Goolwa cockle might also be expected to increase in size and abundance inside SZ-7 on The Coorong Beach, with potential for spill-over and larval export. In zones where there is overlap with areas that have been trawled by the prawn fishery (SZ-5, HPZ-1, HPZ-5; see 4.1.1 earlier) there is potential for an increase in size and abundance of western king prawns.

For resident reef fishes of conservation concern and/or which are vulnerable to localized depletion (namely western blue groper, harlequin fish, bluethroat wrasse, Bight redfish, swallowtail, sea sweep) and which are currently considered to be at UNLL in various sanctuary zones, there is potential that across 20 years their populations may decline further without zoning (as indicated by a – at 20 years), but that they would increase in size and abundance across the 20 year period with the proposed zoning; thus yielding a net positive benefit at 20 years of ++++ (Table 4–2).

Of the other indicator species assessed (and which are not presented in Table 4–2), the following observations were made for the Encounter Marine Park:

- Species occurring within the park but with insufficient information to enable an assessment include: yellowfin whiting and blue swimmer crab.

In addition to the species that were able to be assessed, there are numerous other species (target, byproduct, bycatch) that may also respond to or benefit from the cessation of fishing within SZs (see Appendix 1.3.4 of the Main Report), and which may be found in the relevant park zones (Table 4–3). By preventing fishing, a range of benefits for species may be realised including (but not limited to): elimination of direct fishing mortality and post-release mortality; more natural age, size structure and sex ratio of populations, age and size at maturity and fish behaviour; and reduced incidence of disease (see Section 6.1.1 and Appendix 1 of the Main Report for further discussion and references). Each of the species listed in Table 4–3 has a known direct

interaction with fishing (see Appendix 2 of the Main Report) which justifies their inclusion here. While the impact of the interaction is largely unknown for most species, the point is that the interaction will be removed through zoning, providing a positive benefit to those species. For example, the southern blue devil is a long-lived (Saunders et al., 2010), site-attached reef fish (Bryars, 2010) that is incidentally caught as bycatch (e.g. Fowler et al., 2009) but which is susceptible to barotrauma (Saunders et al., 2010) and therefore may have a low rate of post-release survival. The southern blue devil will therefore benefit from protection inside SZs.

Table 4–3 includes some of the more mobile finfish species which may not respond directly to zoning but may potentially increase in abundance within the park because of the proposed overall reduction of commercial and charter fishing effort, as per the PIRSA (2011) policy position. While it was assumed that the removal of this effort would minimise negative impacts on areas outside SZs, there is potential for the abundance of some fished species to decline outside SZs through displacement of recreational fishing effort, possibly offset to some extent by spill-over (see Appendix 1.3.12 of the Main Report). However, it should be reiterated (see Appendices 1.1.2 and 1.3.13 of the Main Report) that the assessment of the proposed management arrangements does not take into account possible alternative management responses over the next 20 years within the existing management framework.

Of the 11 proposed SZs within the park, nine of them (SZ-2, SZ-3, SZ-4, SZ-5, SZ-6, SZ-7, SZ-8, SZ-10 and SZ-11) show potential for significant measurable responses for many of the indicator fished species, as well as some other species not formally assessed (see Tables 4–2 and 4–3, and Case Studies in 4.1.4). Many of these zones are relatively large and thus the buffering effect from activities at the boundaries will be significant. The localised response of some species inside SZ-6 may be affected in the areas where shore-based line fishing is still allowed. Two of the zones are unlikely to show measurable changes that are due directly to the new arrangements: SZ-1 and SZ-9. SZ-1 is a small zone comprised of intertidal mud/saltmarsh inside the Onkaparinga River estuary and is unlikely to show a direct response to the new zoning as fishing does not occur there currently (bait digging is not allowed there under current regulations) and is unlikely to occur there in the future. SZ-9 which overlays an existing no-take aquatic reserve (American River Aquatic Reserve) should not show any change directly attributable to the new zoning arrangements but could experience flow-on effects from the network of zoning across the parks system. The part of SZ-2 which lies inside an existing aquatic reserve (Port Noarlunga Aquatic Reserve) may show some changes due to the new zoning arrangements which will provide additional limits on fishing to the existing arrangements, and it could also experience flow-on effects from the offshore extension to the existing reserve and the network of zoning across the parks system. The part of SZ-3 which overlays an existing no-take aquatic reserve (Aldinga Reef Aquatic Reserve) is not expected to result in change directly attributable to the new zoning arrangements but could experience flow-on effects from the offshore extension to the existing reserve and also the network of zoning across the parks system. The part of SZ-7 that lies inside the Coorong lagoons is unlikely to show any measurable direct effect of the zoning as it is very small and comprised of intertidal habitat that is not fished.

In addition to possible responses to protection from fishing, many of the fished species will gain long-term positive benefits from protection of the habitats that they rely upon for various stages of their life cycles. These benefits will often be manifested both inside and outside the park boundaries. For the Encounter Marine Park, protection of the intertidal sand/seagrass flat nursery habitats is critical for the long-term sustainability of King George whiting and southern garfish (Bryars, 2003). For southern calamary, protection of the shallow seagrass beds (viz. *Amphibolis*) and reefs will

benefit reproductive output. For sessile or sedentary species such as razorfish and mud cockle, protection of intertidal habitats is critical for the adult, post-larval and juvenile stages of their life cycles (Bryars, 2003). Other fished species which were not directly assessed but which will benefit from nursery habitat protection in the Encounter Marine Park include western Australian salmon, Australian herring, and yelloweye mullet (Bryars, 2003).

Table 4–2 Potential first-order responses of some indicator species^a

Species	Life stages	Sanctuary Zones	Habitat usage	Zone visitation	Recruitment to zone	Recruitment source	Current status	Potential first order responses to zoning at 5, 10 and 20 years							Notes	
								Measure	Scenario	5	10	20	Spill over	Larval export		
Snapper	Adult	2, 3, 4, 5, 6, 10, 11	Reef, Sand	Resident & Temporary resident	Yes (adults)	Gulf St Vincent	UNLL	Size	With Zoning	+	++	+++			Resident fish in the population have potential to increase in size and abundance inside SZs	
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	✓	×	Net effect will be less pronounced in SZ-2 and SZ-3 as some habitat is within existing no-take Aquatic Reserves. No larval export as spawning may not occur here.	
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Southern rock lobster	Adult, sub-adult	4, 5, 6, 10, 11	Reef	Resident	Yes (post-larvae)	South Australia	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	✓	✓	Net effect will be lowered if current management arrangements aimed at long-term recovery of lobster stocks are realised	
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Greenlip abalone, Blacklip abalone	Adult, sub-adult	4, 5, 6, 10, 11	Reef	Resident	Yes (post-larvae)	Local	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	×	✓	Predictions for blacklip abalone may be lowered by negative second order ecosystem interactions with predators such as southern rock lobster	
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Razorfish	Adult, sub-adult	8	Sand, Seagrass	Resident	Yes (post-larvae)	Local	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	×	✓		
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Mud cockle	Adult, sub-adult	8	Sand	Resident	Yes (post-larvae)	Local	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	×	✓		
							UNLL	Abundance	Net effect of Zoning	+	++	+++				

Species	Life stages	Sanctuary Zones	Habitat usage	Zone visitation	Recruitment to zone	Recruitment source	Current status	Potential first order responses to zoning at 5, 10 and 20 years							Notes	
								Measure	Scenario	5	10	20	Spill over	Larval export		
King George whiting	Adult	5, 10	Reef, Seagrass, Sand	Resident & Temporary resident	Yes (adults)	Gulf St Vincent	UNLL	Size	With Zoning	+	++	+++			Resident fish in the population have potential to increase in size and abundance inside SZs (but there is a high degree of uncertainty around this)	
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	✓	?	Uncertain if spawning occurs in the region	
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Goolwa cockle	Adult, sub-adult	7 (Coorong beach area)	Sand	Resident	Yes (post-larvae)	Local	UNLL	Size	With Zoning	+	+	+				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	+	+	✓	✓	Adults can be moved along beaches by currents so possibility of spillover	
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Western king prawn	Adult, sub-adult	5, HPZ-1, HPZ-5 (within GSV & IS)	Sand	Temporary resident	N/A	N/A	UNLL	Size	With Zoning	+	+	+			Size and abundance may be increased inside no-trawling zones but will not increase beyond 5 years	
							UNLL	Abundance	With Zoning	+	+	+				
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	+	+	×	✓	There is some uncertainty around whether these zones have actually been trawled previously	
							UNLL	Abundance	Net effect of Zoning	+	+	+				
Western blue groper	Adult, sub-adult	2, 4, 5, 10, 11	Reef	Resident	Yes (sub-adults)	Unknown	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	-			Incidental mortality from bycatch may continue even though species is protected here	
							UNLL	Abundance	Without Zoning	0	0	-				
							UNLL	Size	Net effect of Zoning	+	++	++++	✓	✓	Net effect may not be as pronounced in SZ-2 as some reef is within an existing no-take Aquatic Reserve and the species is at the northern extent of its distribution there	
							UNLL	Abundance	Net effect of Zoning	+	++	++++				
Western blue groper	Adult, sub-adult	6	Reef	Resident	Yes (sub-adults)	Unknown	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	0			Species is not fully protected in SZ-6 and is currently rare in the area	
							UNLL	Abundance	Without Zoning	0	0	0				
							UNLL	Size	Net effect of Zoning	+	++	+++	✓	✓		
							UNLL	Abundance	Net effect of Zoning	+	++	+++				
Harlequin fish, Bluethroat wrasse	Adult, sub-adult	2, 4, 5, 6, 10, 11	Reef	Resident	Yes (sub-adults)	Unknown	UNLL	Size	With Zoning	+	++	+++				
							UNLL	Abundance	With Zoning	+	++	+++				
							UNLL	Size	Without Zoning	0	0	-			Species has high intrinsic vulnerability to fishing/long-term serial depletion, but no limits on take	
							UNLL	Abundance	Without Zoning	0	0	-				
							UNLL	Size	Net effect of Zoning	+	++	++++	✓	✓	Net effect may not be as pronounced in SZ-2 as some reef is within an existing no-take Aquatic Reserve and shore-based line fishing will still be allowed.	
							UNLL	Abundance	Net effect of Zoning	+	++	++++				

Species	Life stages	Sanctuary Zones	Habitat usage	Zone visitation	Recruitment to zone	Recruitment source	Current status	Potential first order responses to zoning at 5, 10 and 20 years								Notes	
								Measure	Scenario	5	10	20	Spill over	Larval export			
Sea sweep	Adult, sub-adult	2, 4, 5, 6, 10, 11	Reef	Resident	Yes (sub-adults)	Unknown	UNLL	Size	With Zoning	+	++	+++			Species is vulnerable to fishing/serial depletion of reefs		
							UNLL	Abundance	With Zoning	+	++	+++					
							UNLL	Size	Without Zoning	0	0	-					
							UNLL	Abundance	Without Zoning	0	0	-					
							UNLL	Size	Net effect of Zoning	+	++	++++	✓	?	Spawning locations are unknown. Net effect may not be as pronounced in SZ-2 as some reef is within an existing no-take Aquatic Reserve and shore-based line fishing will still be allowed.		
							UNLL	Abundance	Net effect of Zoning	+	++	++++					
Bight redfish, Swallowtail	Adult, sub-adult	6, 10, 11	Reef	Resident	Yes (sub-adults)	Unknown	UNLL	Size	With Zoning	+	++	+++			Species is vulnerable to fishing/serial depletion of reefs		
							UNLL	Abundance	With Zoning	+	++	+++					
							UNLL	Size	Without Zoning	0	0	-					
							UNLL	Abundance	Without Zoning	0	0	-					
							UNLL	Size	Net effect of Zoning	+	++	++++	✓	?	Spawning locations are unknown		
							UNLL	Abundance	Net effect of Zoning	+	++	++++					
Southern calamary	Adult	4, 5, 6, 8, 10	Reef, Seagrass	Temporary resident	N/A	N/A	UNLL	Size	With Zoning	+	+	+			Abundance and size may be temporarily increased each spawning season but there will be no cumulative increase over time		
							UNLL	Abundance	With Zoning	+	+	+					
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management		
							UNLL	Abundance	Without Zoning	0	0	0					
							UNLL	Size	Net effect of Zoning	+	+	+	×	✓	Egg production may be increased		
							UNLL	Abundance	Net effect of Zoning	+	+	+					
King George whiting, Southern garfish	Adult, sub-adult	8	Seagrass	Temporary resident	N/A	N/A	UNLL	Size	With Zoning	0	0	0			Abundance may be temporarily increased during times when fish aggregate but there will be no cumulative increase over time		
							UNLL	Abundance	With Zoning	+	+	+					
							UNLL	Size	Without Zoning	0	0	0			Assumes stocks will remain at current levels under current fisheries management		
							UNLL	Abundance	Without Zoning	0	0	0					
							UNLL	Size	Net effect of Zoning	0	0	0	×	×	Spawning locations are unknown for garfish. Spawning occurs elsewhere for King George whiting.		
							UNLL	Abundance	Net effect of Zoning	+	+	+					

^a This table must be read in conjunction with the methods and assumptions detailed in Appendix 1.3 of the Main Report.

Labels in 'Sanctuary Zone' column refer to Appendix Figure 5–1, and are for SZs unless otherwise specified.

Life history information with supporting references is detailed in Appendix 3 of the Main Report

Current status: UNLL = unnaturally low level compared to pre-fishing; NL = natural level compared to pre-fishing. A pre-fishing baseline was required to enable future predictions of change. A current status of UNLL does not necessarily imply that fisheries exploitation of the species is unsustainable.

The + and – symbols do not indicate the magnitude of a change, but are intended to be indicative of the trend over time. The potential responses do not take into account predator/prey interactions that are discussed in Section 4.1.3 below.

Western blue groper is assessed here, rather than in Section 4.1.2.1, as it is fully protected in only part of its range in SA.

Table 4–3 Other species which may respond to or benefit from protection

Common name	Species name
Black bream	<i>Acanthopagrus butcheri</i>
Black cowry	<i>Zoila friendii thersites</i>
Blue morwong	<i>Nemadactylus valenciennesi</i>
Bronze whaler	<i>Carcharhinus brachyurus</i>
Cobbler	<i>Gymnapistes marmoratus</i>
Congolli	<i>Pseudaphritis urvillii</i>
Dusky morwong	<i>Dactylophora nigricans</i>
Dusky whaler	<i>Carcharhinus obscurus</i>
Eagle ray	<i>Myliobatis australis</i>
Estuary catfish	<i>Cnidoglanis macrocephalus</i>
Giant cuttlefish	<i>Sepia apama</i>
Greenback flounder	<i>Rhombosolea tapirina</i>
Gummy shark	<i>Mustelus antarcticus</i>
Hammer oyster	<i>Malleus meridianus</i>
Horseshoe leatherjacket	<i>Meuschenia hippocrepis</i>
King scallop	<i>Pecten fumatus</i>
Leafy seadragon	<i>Phycodurus eques</i>
Longsnout boarfish	<i>Pentaceropsis recurvirostris</i>
Longsnout flounder	<i>Ammotretis rostratus</i>
Magpie perch	<i>Cheilodactylus nigripes</i>
Maori octopus	<i>Octopus maorum</i>
Moonlighter	<i>Tilodon sexfasciatus</i>
Mulloway	<i>Argyrosomus japonicus</i>
Polychaete worms	Polychaete worms
Port Jackson shark	<i>Heterodontus portusjacksoni</i>
Purple urchin	<i>Helicodaris erythrogramma</i>
Queen scallop	<i>Equichlamys bifrons</i>
Rock ling	<i>Genypterus tigerinus</i>
Sand crab	<i>Ovalipes australiensis</i>
Sand flathead	<i>Platycephalus bassensis</i>
School whiting	<i>Sillago bassensis</i>
Silver drummer	<i>Kyphosus sydneyanus</i>
Silver trevally	<i>Pseudocaranx georgianus</i>
Smalltooth flounder	<i>Pseudorhombus jenynsii</i>
Southern blue devil	<i>Paraplesiops meleagris</i>
Southern fiddler ray	<i>Trygonorrhina dumerilii</i>
Southern silverbelly	<i>Parequula melbournensis</i>
Spider crab	<i>Leptomithrax gaimardii</i>
Sponges	Sponges
Spotted pipefish	<i>Stigmatopora argus</i>
Spotted wobbegong	<i>Orectolobus maculatus</i>
Wavy volute	<i>Amoria undulata</i>
Weedy seadragon	<i>Phyllopteryx taeniolatus</i>
Weeping toadfish	<i>Torquigener pleurogramma</i>
Yelloweye mullet	<i>Aldrichetta forsteri</i>

Common name	Species name
Zebrafish	<i>Girella zebra</i>

4.1.2.3 Other species

There are numerous species that are neither listed as protected/threatened nor fished but which may also benefit from maintenance and/or improvement of habitats and ecological processes in the park. Representatives of such species (see Appendix 2 of the Main Report) in the Encounter Marine Park include: herring cale (*Olisthops cyanomelas*), long-finned goby (*Favonigobius lateralis*), common bullseye (*Pempheris multiradiata*), Noarlunga hulafish (*Trachinops noarlungae*), Wood's siphonfish (*Siphamia cephalotes*), winkles (*Austrocochlea* spp.), brittlestars, featherstar (*Cenolia trichoptera*), eleven-armed seastar (*Coscinasterias muricata*), short-tail nudibranch (*Ceratosoma brevicaudata*), cartrut shell (*Dicathais orbita*), Roe's abalone (*Haliotis roei*), blue-ringed octopus (*Hapalochlaena maculosa*), *Lepsiella vinosa*, isopods, western black crow (*Nerita atramentosa*), reef crab (*Ozius truncatus*), *Paphies elongata*, *Phasianotrochus eximius*, *Phasianotrochus irisodontes*, red bait crab (*Plagusia chabrus*), gorgonian fan coral (*Mopsella klunzingeri*), green coral (*Plesiastrea versipora*), tulip shell (*Pleuroploca australasia*), *Salinator fragilis*, air breathing gastropod (*Marinula xanthosoma*), sea tulips (*Pyura* spp.), *Thalotia conica*, canopy-forming macroalgae (*Ecklonia radiata*, *Cystophora* spp., *Sargassum* spp. and *Scaberia agardhii*), meadow-forming seagrasses (*Posidonia* spp., *Amphibolis* spp.), and *Sarcocornia quinqueflora*.

4.1.3 Ecosystems

The current state of the ecosystems in the park generally reflects the condition of the component habitats and species documented above. Similarly, responses of the ecosystem to the proposed management changes are informed by the predictions for habitats and species above. The proposed management changes also provide for the restoration of more natural predator-prey relationships (among other interactions) for the more resident species within SZs of an appropriate size. This may result in increased abundances of some species, but decreases for others. In particular, it can be expected that there will be a response of reef ecosystems with interactions between lobster, snapper, blacklip abalone and urchins, and potentially blue groper and Maori octopus (see Figure 4–1 and Section 4.1.4 below). Most notably, changes might be expected in the reef ecosystems of SZ-4, SZ-5, SZ-6, SZ-10 and SZ-11 where first-order fished species changes have been predicted to occur (see Section 4.1.2.2 earlier).

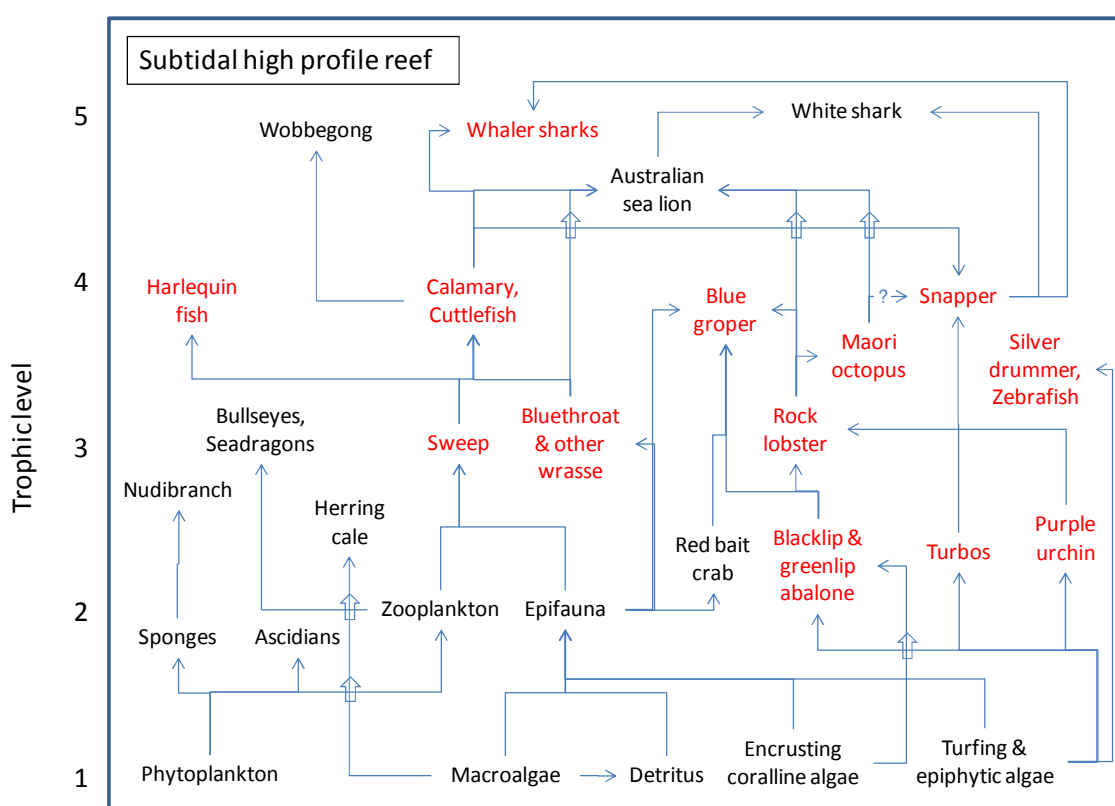
Natural food webs cannot be fully restored, due to the scales over which the more mobile higher- and middle-order fished species range. However, some increase in abundance of such species is expected as a result of the proposed overall reduction of fishing effort in the marine scalefish and charter fisheries, as per the PIRSA (2011) policy position, and there may be localised flow-on effects for food webs inside the marine parks.

It is also apparent from the simplified food webs (see Figure 4–1 and Appendix 6 of Main Report) that many fished species (shown in red text) and non-fished species are ultimately reliant upon the maintenance of habitat-forming species (such as macroalgae and seagrasses) which lie at or near the base of the food webs, and it is these very habitats that will receive a high level of protection within the marine parks network. Thus the marine parks network will have a positive long-term impact on

ecosystems regardless of whether there are zone-specific responses following implementation of the management plans.

The estuarine systems of the Onkaparinga River and The Coorong are considered to be changed from pre-European times with altered freshwater flows, agricultural run-off, and in the case of the Onkaparinga, urban run-off and contamination (Bryars, 2003). The parts of the Coorong estuary that lie within the park are zoned as HPZ and SZ (HPZ-6, SZ-7). However, the management plan is unlikely to influence the major issues threatening the system. Likewise, it is difficult to envisage the proposed zoning plan influencing threatening processes within the Onkaparinga estuary. Nevertheless, restoration of previously trawled offshore areas and ongoing protection of habitats (particularly at lower trophic levels) should also provide long-term benefits for some ecosystems in the park.

Figure 4–1 Simplified conceptual food web for subtidal high profile reef



Note: showing links between a variety of species across all trophic levels and indicating those species that interact with fishing (highlighted in red). See Appendix 6 of the Main Report for further details about the food web.

4.1.4 Case studies

The Encounter Marine Park is one of the most complex parks in the marine parks network with a wide range of habitat types and associated species. It is probably also the park that has been most affected by humans through pollution, coastal developments, catchment modification, and fishing. The Encounter Marine Park is a heavily populated and heavily fished area where the current status of many species is below what one would expect without fishing activity (see Section 4.1.2.2). However, due to these previous impacts, the Encounter Marine Park is likely to experience major biodiversity benefits inside most of the 11 proposed sanctuary zones that are scattered

throughout the park. As the Encounter Marine Park has a relatively large number of sanctuary zones across a wide range of locations and habitats, three different case studies are presented here to highlight a range of possible conservation outcomes from the proposed zoning and management plan.

Reef communities off Victor Harbor

An excellent example of possible changes inside a no-take sanctuary zone comes from SZ-6 near Victor Harbor. SZ-6 extends from the shore out to deeper waters and includes a significant area of subtidal high profile reef (11.6 km² with a substantial unmapped area of 12.6 km² that may also contain reef). Subtidal high profile reef supports a vast array of species, many of which are fished (see Figure 4–1). Recreational fishing activity in the Victor Harbor area is relatively high (Jones, 2009) with lobster potting, line fishing and spearfishing all occurring. Targeted species include southern rock lobster, abalone, and various reef fishes.

Without fishing activity in SZ-6, it is expected that there will be an increase in size and abundance of reef fishes such as snapper, Bight redfish, sea sweep, western blue groper, and harlequin fish, and an increase in size and abundance of invertebrates such as southern rock lobster (see Section 4.1.2.2). If numbers do increase then spill-over of some of these species into surrounding reef areas may also be expected. While single species responses will occur, ecosystem interactions are also likely to occur and this may influence the response of prey species such as blacklip abalone. Monitoring programs in no-take marine sanctuaries in Tasmania and New Zealand (where similar reef species occur) have shown that predator-prey interactions can influence the abundance of species and that those changes can take many years to occur (see Appendix 1.4.4 of the Main Report).

The proposed management changes associated with SZ-6 provide an opportunity for the restoration of more natural predator-prey relationships for the more resident species (Figure 4–1). In particular, it can be expected that there will be a response of the reef ecosystem with possible interactions between lobster, abalone, snapper and urchins, which may potentially include blue groper and Maori octopus. All of these predictions are of course reliant on the absence of illegal fishing. Because of the potential for significant changes to occur and because SZ-6 is located adjacent to a major regional centre (Victor Harbor), this particular zone is likely to be of special significance for biodiversity conservation, research, and education within the Encounter Marine Park.

Blue groper, blue devils, and harlequin fish off Snapper Point

A relatively large (59.9 km²) sanctuary zone (SZ-10) has been proposed adjacent to the Snapper Point area on Dudley Peninsula off northeast Kangaroo Island. SZ-10 extends alongshore from Alex Lookout to Cape Coutts and includes about seven kilometres of rocky coastline which plunges steeply into the deeper waters of Backstairs Passage. The coastal reef habitat in this region is home to a number of reef fishes of conservation concern including the western blue groper, southern blue devil, and harlequin fish (Edgar et al., 2005, Baker, 2011). Each of these species is known to be incidentally captured by fishers in the area while targeting other species such as snapper and Bight redfish. While the western blue groper is now protected in this part of South Australia, it is possible that their numbers were reduced there during the 1960s and 1970s prior to their protection. For the other two species there are currently no catch regulations. Furthermore, all three species are known to suffer from barotrauma when hauled from depth, so even if fish are released, their survival may be low. All three species are also site-attached (Bryars, 2010, 2011; Bryars et al., 2011,

2012a,b) and very long-lived (blue groper 70 years, Coulson et al., 2009; blue devil 59 years and harlequin fish 42 years, Saunders et al., 2010). Thus the western blue groper, southern blue devil and harlequin fish have characteristics that make them intrinsically vulnerable to overfishing and they cannot be fully protected from fishing using protected species status. However, the implementation of no-take sanctuary zones provides a means of totally protecting such species from fishing and other localised impacts.

Fortunately for each of the three species, recent research indicates that relatively small sanctuary zones can fully encompass the home ranges of individual fish such that they cannot be captured at the zone boundaries (Bryars, 2010, 2011; Bryars et al., 2011, 2012a,b). Acoustic tracking work has found that individual blue groper and harlequin fish are usually resident within small sections of coastal reef (of about 1 km or less) but that several kilometres of coastline may be required to encompass a population of fish and to accommodate temporary alongshore migrations (Bryars et al. 2011, 2012a,b; see also Species Profiles in Appendix 3 of the Main Report). The southern blue devil appears to have a much smaller home range (Bryars, 2011). Thus it is likely that SZ-10 with its seven kilometre expanse of coastline and adjacent deeper waters will provide a significant positive long-term conservation benefit for the western blue groper, southern blue devil, and harlequin fish by protecting fish that are already resident within the zone and by providing protection for new juvenile recruits (see also Section).

Southern calamary off Rapid Head

A relatively large (55.5 km²) sanctuary zone (SZ-5) has been proposed adjacent to the Rapid Head area on Fleurieu Peninsula. SZ-5 includes 4.5 km of rocky reef coastline and expansive areas of shallow seagrass meadows. These areas are favoured habitats for spawning of the southern calamary which may be afforded biodiversity conservation benefits from the implementation of SZ-5.

The southern calamary has a complex, but short, life history that involves a number of habitat types across large spatial scales (see Triantafillos, 2008 and Species Profile in Appendix 3 of the Main Report). Adults move inshore to mate and attach eggs to shallow subtidal seagrass beds (viz. *Amphibolis antarctica*) and shallow subtidal macroalgal-covered reefs (viz. *Cystophora* spp.). They remain on these spawning grounds for several months and may move substantial distances within them; but they can be considered to be temporary residents within an area during the breeding period (see Species Profile in Appendix 3 of the Main Report). Following mating and egg laying the adults die (they live for <1 year). Once the eggs hatch the juveniles or hatchlings are thought to remain inshore for some time before moving offshore to deeper sandy habitats where they remain until they are ready to return inshore as adults where they then mate and die. It is unknown (but unlikely) whether adults return to the same site as where they were born.

Fishing mortality of southern calamary is high with an annual commercial catch of 399 tonnes across the State in 2009/10 (Knight and Tsolos, 2011) and an estimated 206 tonnes (representing almost 500,000 individuals) taken in 2007/08 by recreational fishers (Jones, 2009). Localised depletions of breeding aggregations are therefore possible (Triantafillos, 2008). Commercial and recreational fishing effort within the Encounter Marine Park is significant. It is possible that in the absence of fishing the abundance of calamary inside SZ-5 will be temporarily increased during spawning aggregation times. As the species grows rapidly, an increase in body size will be seen over just a few months and thus both size and abundance may increase. This apparent 'increase' in biomass would only be temporary while the calamary are on the breeding ground after which time they will die of natural causes. There will be no long-term

increase in abundance within SZ-5 as, once the eggs hatch, the juveniles will move offshore where they will mix together with other juveniles from other breeding grounds and grow until a new cohort of adults moves inshore again the next year to breed, .i.e. these adults may have been derived from breeding grounds in many different areas and not just SZ-5.

The decrease in fishing mortality within SZ-5 during the breeding period could have a number of biodiversity conservation outcomes: (1) it will allow the calamary to breed and lay eggs and thus there may be increased 'larval export' compared to if the SZ wasn't there, (2) if the larval export is evident each year it could potentially contribute to the long-term maintenance of the overall population, and (3) the maintenance of breeding numbers at a level that is more natural may allow other ecological interactions to be restored such as predation by calamary on small fishes, and predation on calamary by large fishes such as snapper (see Figure 4–1). The implementation of SZ-5 (and HPZ-5 around southern Fleurieu Peninsula) should also ensure the long-term protection of the habitats which the calamary rely upon for breeding and which many other species also rely upon for their survival (see Figure 4–1, and food webs in Appendix 6 of the Main Report).

4.2 Economic

4.2.1 Commercial Fishing

The analysis of the impact of displaced catch and/or effort on commercial fishing is based on:

- Estimates of displaced catch and/or effort provided by the South Australian Research and Development Institute (Ward and Burch 2012).
- PIRSA Fisheries and Aquaculture policy position on redistribution of displaced commercial fishing, which states that the displaced catch for sardines can be redistributed, for prawns can be redistributed up to 2 per cent of total fishery catch, and for other fisheries cannot be redistributed (PIRSA 2011). For fisheries where displaced catch cannot be redistributed it is assumed that the displaced effort will be removed from the fishery.

For some fisheries, the relevant fishing industry association has undertaken their own assessment of displaced catch/effort. The methods and data used to make these industry assessments will be reviewed by SARDI (DEWNR pers. comm., 6 July 2012). Analysis of the impact of displaced catch/effort on commercial fishing based on these industry estimates has been included in the following sections.

4.2.1.1 Summary

Table 4-4 shows the economic impact on the regional economy of marine park zoning on all affected fisheries. Impacts are based on SARDI's average annual displaced catches and corresponding average annual prices expressed in 2011 dollars. In aggregate, it was estimated that the impact of marine park zoning will generate the following loss of regional economic activity on an ongoing annual basis.

- Approximately \$1.98m in GRP which represents 0.08 per cent of the regional total (\$2.46b).

- Approximately 28 fte jobs which represent 0.1 per cent of the regional total (28,789 fte jobs).
- Approximately \$0.128m in household income which represents 0.1 per cent of that regional total (\$1.33b).

Because the reduced access to the fishery will be permanent, the impacts reported in Table 4-4 are an estimate of the on-going, annual impact.

Table 4-4 Regional economic impact of marine park zoning based on SARDI estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Lakes & Coorong	-0.88	25%	-10	34%	-0.55	43%	-0.68	34%
Marine Scalefish	-0.10	3%	-1	5%	-0.05	4%	-0.08	4%
Charter Boat	-0.08	2%	-1	3%	-0.03	2%	-0.05	3%
Downstream ^b	-1.04	29%	-8	27%	-0.26	20%	-0.41	21%
<i>Total Direct ^c</i>	<i>-2.11</i>	<i>59%</i>	<i>-19</i>	<i>68%</i>	<i>-0.89</i>	<i>69%</i>	<i>-1.22</i>	<i>62%</i>
<i>Total Flow-on ^c</i>	<i>-1.47</i>	<i>41%</i>	<i>-9</i>	<i>32%</i>	<i>-0.40</i>	<i>31%</i>	<i>-0.76</i>	<i>38%</i>
Total ^c	-3.59	100%	-28	100%	-1.28	100%	-1.98	100%
Regional Total ^d	4,744.22		28,789		1,332.60		2,463.87	
Impact on Region	-0.08%		-0.10%		-0.10%		-0.08%	

^a Full-time equivalent jobs.

^b Downstream activities consist of processing, retail trade, accommodation, cafes and restaurants and transport.

^c Totals may not sum due to rounding.

^d Fleurieu and Coorong region (see Appendix 1).

Source: EconSearch analysis

The estimates of historical catches in sanctuary zones for abalone, rock lobster, pipi, marine scalefish, blue crab and charter boats have a high level of uncertainty because of the limited spatially-resolved data available for these fisheries (Ward and Burch 2012). According to industry-derived estimates of displaced catch (which are yet to be reviewed by SARDI), the aggregate regional impacts could be as high as 36 fte jobs and \$2.48m in GRP.

The State Government has committed to buy out licences and quota entitlements of displaced effort and catch although details of the buyout are yet to be finalised. Compensation payments have the potential to offset the negative impact of the displaced catch reported in Table 4-4. However, if compensation is limited to the buyout of displaced fishing entitlements, the negative impacts on the local economy are unlikely to be fully offset:

- There would be no requirement for the recipients of the buyout to spend or invest the funds in the region.
- Even if all the funds were invested in full in the region it is unlikely the investment would generate economic activity and wealth equivalent to that generated by the displaced fishing activity. This is because fishers have the opportunity to sell their licences at any time (they are fully transferable) but choose not to. If there were alternative investment opportunities locally that

fishers had the skill and risk bearing capacity to undertake, then it is reasonable to assume that they would already be doing it.

For entitlement holders there are potentially direct financial losses suffered as a direct consequence of the cancellation of their entitlement. These could take the form of:

- a pecuniary loss such as removal and re-establishment costs or legal costs in acquiring a replacement licence/entitlements
- a capital loss of business operation - the loss of a partial entitlement or the location of sanctuary zones may negatively impact the efficiency of business operations, which might in turn impact on the market value of plant and equipment, as well as the market value of remaining fishing entitlements held by the licence holder.

4.2.1.2 Sardines

SARDI estimates of historical catch in draft sanctuary zones indicate that there would be nil catch displaced from this marine park.

4.2.1.3 Prawns

SARDI estimates indicate that historically there has been an average annual catch of 4,508 kg of prawns in the draft sanctuary and habitat protection zones in this marine park. This represents 2.03 per cent of the Gulf St Vincent Prawn Fishery average annual catch or 5.25 per cent of the average annual catch in the Fleurieu and Coorong, and Kangaroo Island regions. The value of this sanctuary and habitat protection zone catch is approximately \$86,000. Under PIRSA policy two per cent of this catch can be redistributed. This redistributed component does not represent lost income to the fishery, however additional costs may be incurred by the fishery in catching the equivalent quantity of prawns in more distant waters. It has been assumed that the remaining 0.03 per cent of catch effort will be removed and the value of this catch is approximately \$1,000.

According to the Gulf St Vincent Prawn Fishery Association a recent review of the fishery (Knuckey et al. 2011) and subsequent changes to the fishery's harvest strategy means there will be increased fishing below 35 degrees south, where previously there were significant restrictions. Without information on the boundaries of the habitat protection zones, it was not possible for the Association to make precise quantitative estimates of how the fishery may be affected. However, because there is now more flexibility to fish further south, an area which includes the Rapid Bay sanctuary zone, estimates of displaced effort based on historical data understate the future impact on the fishery. Verbal industry assessments based on catch locations in recent years (yet to be verified by industry) estimate the displaced catch to be in range of 20 to 50 tonnes. As this estimate is based on catch in recent years only and there is a large degree of uncertainty in the range of displaced catch, economic impacts have not been modelled.

4.2.1.4 Abalone

SARDI estimates indicate that historically there has been an average annual catch of 163 kg of greenlip abalone in the draft sanctuary zones in this marine park. This represents 0.11 per cent of the greenlip abalone Central Zone catch. Likewise, SARDI

estimates indicate that historically there has been an average annual catch of 104 kg of blacklip abalone in the draft sanctuary zones in this marine park. This represents 0.30 per cent of the blacklip abalone Central Zone catch. The value of this sanctuary zone catch is approximately \$13,000. The combined sanctuary zone catch of both greenlip and blacklip abalone represents 0.56 per cent of the average annual catch in the Fleurieu and Coorong, and Kangaroo Island regions.

4.2.1.5 Rock Lobster

SARDI estimates⁷ indicate that historically there has been an average annual catch of 679 kg of rock lobster in the draft sanctuary zones in this marine park. This represents 0.10 per cent of the Northern Zone Rock Lobster Fishery average annual catch or 0.40 per cent of the average annual catch in the Fleurieu and Coorong, and Kangaroo Island regions. The value of this sanctuary zone catch is approximately \$35,000.

According to the Knuckey (2012) the industry estimate of displaced catch is slightly higher than the estimate prepared by SARDI. The sanctuary zone catch of rock lobster was estimated by Knuckey (2012) to be 835 kg. Based on this estimate (which has not yet been reviewed by SARDI), the value of this catch is \$43,000.

4.2.1.6 Pipi (Goolwa Cockle)

Pipi are harvested as part of the Lakes and Coorong fishery under quota. SARDI estimates indicate there was a catch of 48,089 kg of pipi in the area of the draft sanctuary zones in this marine park in 2009/10. This represented 16.02 per cent of the pipi catch in that year.

It is worth noting however, that the reported catch in the draft sanctuary zone in 2009/10 was relatively low (PIRSA pers. comm., 29 September 2011). Pipi stocks are continually moving and an area where there has been a small catch one year may be an area of high productivity the following year. The absence of historical spatially-resolved data makes it difficult to predict the impact the sanctuary zones will have on the commercial fishery. If high concentrations of Pipi were to move into the area of the sanctuary zone in a particular year, it would concentrate effort onto other areas with high densities of Pipi to fulfil the total allowable commercial catch (TACC), which could possibly lead to localised depletion (PIRSA pers. comm., 29 September 2011).

Another point to note is that the Pipi TACC is expected to increase over the next five years, as stocks are presently recovering from previously being over fished. The TACC is expected to rise for the 2011/2012 season and it has been forecasted that once the stocks are fully recovered from recent overfishing, a TACC of approximately 600 tonnes or above may be sustainable in the long-term (PIRSA pers. comm., 29 September 2011). This is close to double the current TACC of 330 tonnes.

To reflect this outlook for medium to long-term recovery, the economic impacts have been estimated assuming a TACC of 600t.

The value of output lost directly in the region by Lakes and Coorong fishing enterprises was estimated to be \$0.88m and a further \$0.88m was estimated to be lost to associated downstream activities (processing, transport and retail/food services). Flow-

⁷ Based on 17 years (1993-2009) of logbook and pot sampling data, and assumes catch is evenly distributed within State waters within each marine fishing area. See Ward and Burch (2012) for more details.

on output lost to other sectors of the regional economy was estimated to be \$0.58m. The total loss in output in the region (direct plus indirect) was estimated to be \$3.01m (Table 4-5). Because the reduced access to the fishery will be permanent, the impacts reported in Table 4-5 are an estimate of the on-going, annual impact.

Table 4-5 Regional economic impact of marine park zoning on pipi based on SARDI estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	-0.88	29%	-10	41%	-0.55	50%	-0.68	41%
Downstream ^b	-0.88	29%	-6	27%	-0.21	20%	-0.34	21%
<i>Total Direct</i> ^c	-1.77	59%	-16	68%	-0.76	70%	-1.02	61%
Flow-on effects								
Trade	-0.24	8%	-3	12%	-0.08	8%	-0.11	7%
Manufacturing	-0.19	6%	-1	3%	-0.04	3%	-0.06	3%
Accom, Cafe, Rest	-0.16	5%	-1	5%	-0.05	4%	-0.07	4%
Transport	-0.07	2%	0	2%	-0.02	1%	-0.03	2%
Other Sectors	-0.58	19%	-3	11%	-0.15	14%	-0.38	23%
<i>Total Flow-on</i> ^c	-1.24	41%	-8	32%	-0.33	30%	-0.65	39%
Total ^c	-3.01	100%	-24	100%	-1.09	100%	-1.66	100%

^a Full-time equivalent jobs.

^b Downstream activities consist of seafood processing, transport, retail trade and food services.

^c Totals may not sum due to rounding.

Source: EconSearch analysis

The loss in direct employment in the Lakes and Coorong fishery in the region was estimated to be 10 fte jobs, while downstream activities were estimated to lose around 6 fte jobs. Flow-on business activity was estimated to lose a further 8 fte jobs, while the total loss in employment is estimated to be approximately 24 fte jobs.

Contribution to GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. The loss in total Lakes and Coorong fishing industry related contribution to GRP in South Australia is \$1.66m, \$0.68m lost by fishing directly, \$0.34m in downstream activities and \$0.65m lost in other sectors of the regional economy.

A reduced sustainable yield, compared to the long-term sustainable yield without the sanctuary zone, will negatively impact profitability and the rate of return on investment and thereby devalue the relative value of licences and quota. This is because if quota is bought out, rather than whole licences, there will be reduced average income per licence but unchanged fixed costs.

These estimates of reduced regional economic activity and profitability are likely to persist into the future, i.e. over next 20 years, as the reduced access to the resource will be permanent.

The proposed sanctuary zone could have a positive impact on the commercial Pipi fishery by leaving an untouched area of stock. However this positive impact would most likely be minimal as the Pipi fishery is already managed by quota, which limits the

commercial take of Piri to a sustainable level, mitigating the risk of overfishing (PIRSA pers. comm., 29 September 2011).

According to the Goolwa Piri Harvesters Association the SARDI estimates are consistent with estimates prepared by licence holders.

4.2.1.7 Marine Scalefish

The difficulty in removing effort from the Marine Scalefish Fishery is the persistent high level of latent effort in the fishery. In 2009/10, approximately 10 per cent (32) of the 328 licences state wide were inactive, while a further 25 per cent of licences (84) were fished for less than 50 days (SARDI pers. comm., 20 September 2011). In such circumstances, significant funds can be expended in effort reduction programs with little real reduction in effort. If the displaced effort is not removed from the fishery, then that effort will be applied to other areas. For many species, current harvest levels are at, or are close to, optimum sustainable yields (PIRSA pers. comm., 29 September 2011). Despite these practical difficulties, the following analysis, based on SARDI estimates, assumes that the fishing effort previously occurring in the sanctuary zones will be removed from the fishery⁸.

SARDI estimates of historic effort in draft sanctuary zones for the Marine Scalefish Fishery are provided in Table 4-6 and historic catch for the main fishery species in Table 4-7. The total sanctuary zone catch of marine scalefish represents 2.1 per cent of the average annual catch in the Fleurieu and Coorong, and Kangaroo Island regions.

Table 4-6 Average annual Marine Scalefish effort in draft sanctuary zones by sector

Sector	Sanctuary zone effort (person days)	% effort of sector
Handline	96	0.34
Haulnet	20	0.27
Longline	38	0.70
Other	183	0.82

Notes: Handline, longline and other gear sectors based on 10 years of data, haulnet based on 3 years of data

Source: Ward and Burch 2012.

Table 4-7 Average annual Marine Scalefish catch in draft sanctuary zones by main species

Species	Sanctuary zone catch (kg)	% species catch in fishery
Garfish	653	0.23
King George whiting	1672	0.49
Snapper	1,226	0.16
Southern calamary	3,414	1.09

Notes: based on 3 years of data

Source: Ward and Burch 2012.

The value of output lost directly in the region by Marine Scalefish fishing enterprises was estimated to be \$0.10m and a further \$0.10m was estimated to be lost to associated downstream activities (processing, transport and retail/food services). Flow-

⁸ An adjustment was made in the analysis for the fact that SARDI estimates are based on 4 key species representing 57 per cent of the fishery.

on output lost to other sectors of the regional economy was estimated to be \$0.14m. The total loss in output in the region (direct plus indirect) was estimated to be \$0.35m (Table 4-8). Because the reduced access to the fishery will be permanent, the impacts reported in Table 4-8 are an estimate of the on-going, annual impact.

The loss in direct employment in the Marine Scalefish fishery in the region was estimated to be 1 fte jobs, while downstream activities were estimated to lose 1 fte job. Flow-on business activity was estimated to lose a further 1 fte job, while the total loss in employment is 3 fte jobs.

Table 4-8 Regional economic impact of marine park zoning on the Marine Scalefish fishery based on SARDI estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	-0.10	30%	-1	45%	-0.05	46%	-0.08	41%
Downstream ^b	-0.10	30%	-1	26%	-0.03	22%	-0.04	21%
<i>Total Direct ^c</i>	<i>-0.21</i>	<i>60%</i>	<i>-2</i>	<i>71%</i>	<i>-0.08</i>	<i>68%</i>	<i>-0.12</i>	<i>62%</i>
Flow-on effects								
Trade	-0.03	8%	0	10%	-0.01	8%	-0.01	7%
Manufacturing	-0.02	6%	0	3%	0.00	4%	-0.01	3%
Accom, Cafe, Rest	-0.02	5%	0	5%	-0.01	5%	-0.01	4%
Transport	-0.01	3%	0	2%	0.00	2%	0.00	2%
Other Sectors	-0.06	18%	0	9%	-0.02	14%	-0.04	21%
<i>Total Flow-on ^c</i>	<i>-0.14</i>	<i>40%</i>	<i>-1</i>	<i>29%</i>	<i>-0.04</i>	<i>32%</i>	<i>-0.07</i>	<i>38%</i>
Total ^c	-0.35	100%	-3	100%	-0.12	100%	-0.19	100%

^a Full-time equivalent jobs.

^b Downstream activities consist of seafood processing, transport, retail trade and food services.

^c Totals may not sum due to rounding.

Source: EconSearch analysis

Contribution to GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. The loss in total Marine Scalefish fishing industry related contribution to GRP in the region is \$0.19m, \$0.08m lost by fishing directly, \$0.04m in downstream activities and \$0.07m lost in other sectors of the regional economy.

Many fishers in the Marine Scalefish Fishery do not own GPS, with knowledge of known fishing grounds passed down through the family. For these families the purchase of GPS will be necessary to ensure they comply with the marine park zoning rules, particularly those sanctuary zones, in offshore areas (PIRSA pers. comm. 29 September 2011). These types of one-off expenditures will have a short-term impact on cost only.

Estimates of historical marine scalefish catches in sanctuary zones have a high level of uncertainty because of the limited spatially-resolved data available for the fishery (Ward and Burch 2012). SARDI estimates assumed that catch of the fishery was evenly distributed in State waters within each marine fished area. This assumption introduces significant potential for over- and under-estimation of the historical catches for individual sanctuary zones.

According to the Marine Fishermen's Association the SARDI estimates are significantly below estimates prepared by licence holders⁹. The industry estimates indicated displaced effort of 54,000 kg in southern calamary, garfish, snapper, shark, King George whiting, salmon, mullet, snook and Australian herring. This displaced catch (which has not yet been reviewed by SARDI) is estimated to have an annual average value of \$353,000.

Based on these industry estimates (which are yet to be reviewed by SARDI), the value of output lost directly in the region by Marine Scalefish fishing enterprises was calculated to be \$0.35m and a further \$0.35m was estimated to be lost to associated downstream activities. Flow-on output lost to other sectors of the regional economy was estimated to be \$0.47m. The total loss in output in the region (direct plus indirect) was estimated to be \$1.18m (Table 4-9).

The loss in direct employment in the Marine Scalefish fishery in the region was estimated to be 5 fte jobs, while downstream activities were estimated to lose 3 fte jobs. Flow-on business activity was estimated to lose 2 fte jobs, while the total loss in employment is to be approximately 10 fte jobs.

The loss in total Marine Scalefish fishing industry related contribution to GRP in the region is \$0.64m, \$0.27m lost by fishing directly, \$0.14m in downstream activities and \$0.24m lost in other sectors of the regional economy.

Table 4-9 Regional economic impact of marine park zoning on the Marine Scalefish fishery based on industry estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	-0.35	30%	-5	45%	-0.18	46%	-0.27	41%
Downstream ^b	-0.35	30%	-3	26%	-0.09	22%	-0.14	21%
Total Direct ^c	-0.71	60%	-7	71%	-0.26	68%	-0.40	62%
Flow-on effects								
Trade	-0.09	8%	-1	10%	-0.03	8%	-0.04	7%
Manufacturing	-0.07	6%	0	3%	-0.01	4%	-0.02	3%
Accom, Cafe, Rest	-0.06	5%	0	5%	-0.02	5%	-0.03	4%
Transport	-0.03	3%	0	2%	-0.01	2%	-0.01	2%
Other Sectors	-0.21	18%	-1	9%	-0.06	14%	-0.14	21%
Total Flow-on ^c	-0.47	40%	-3	29%	-0.13	32%	-0.24	38%
Total ^c	-1.18	100%	-10	100%	-0.39	100%	-0.64	100%

^a Full-time equivalent jobs.

^b Downstream activities consist of seafood processing, transport, retail trade and food services.

^c Totals may not sum due to rounding.

Source: EconSearch analysis

As the Marine Scalefish fishery also operates in Commonwealth waters, the potential cumulative impact of the proposed extension to and revised zoning of the Commonwealth Great Australian Marine Park and the proposed Western Eyre Commonwealth Marine Reserve may place further pressure on fishing business viability.

⁹ Catch data from the last five to seven years provided by affected fishers (Marine Fishers Association, pers. comm., 19 June 2012).

4.2.1.8 Blue Crab

SARDI estimates of historical catch in draft the sanctuary zones indicate that there would be nil catch displaced from this marine park.

4.2.1.9 Charter Boat

SARDI estimates indicate that historically there has been an average annual charter boat effort of 320 person days in the draft sanctuary zones in this marine park. This represents 1.48 per cent of the average annual effort for the charter boat industry or 4.4 per cent of the average annual effort in the Fleurieu and Coorong, and Kangaroo Island regions.

The value of output lost directly in the region by Charter Boat fishing enterprises was estimated to be \$0.08m and a further \$0.05m was estimated to be lost to associated downstream activities (accommodation, transport and retail/food services). Flow-on output lost to other sectors of the regional economy was estimated to be \$0.08m. The total loss in output in the region (direct plus indirect) was estimated to be \$0.22m (Table 4-10).

Table 4-10 Regional economic impact of marine park zoning on the Charter Boat fishery based on SARDI estimates of displaced effort

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	-0.08	37%	-1	44%	-0.03	41%	-0.05	44%
Downstream ^b	-0.05	24%	-1	27%	-0.02	25%	-0.02	20%
<i>Total Direct ^c</i>	<i>-0.13</i>	<i>61%</i>	<i>-1</i>	<i>72%</i>	<i>-0.04</i>	<i>66%</i>	<i>-0.08</i>	<i>64%</i>
Flow-on effects		0%		0%		0%		0%
Trade	-0.02	8%	0	11%	-0.01	9%	-0.01	7%
Manufacturing	-0.01	6%	0	3%	0.00	4%	0.00	3%
Accom, Cafe, Rest	-0.01	2%	0	2%	0.00	2%	0.00	2%
Transport	0.00	2%	0	1%	0.00	1%	0.00	2%
Other Sectors	-0.04	20%	0	11%	-0.01	18%	-0.03	22%
<i>Total Flow-on ^c</i>	<i>-0.08</i>	<i>39%</i>	<i>-1</i>	<i>28%</i>	<i>-0.02</i>	<i>34%</i>	<i>-0.04</i>	<i>36%</i>
Total ^c	-0.22	100%	-2	100%	-0.07	100%	-0.12	100%

^a Full-time equivalent jobs.

^b Downstream activities consist of retail trade, accommodation, cafes and restaurants and transport.

^c Totals may not sum due to rounding.

Source: EconSearch analysis

The loss in direct employment in the Charter Boat fishery in the region was estimated to be 1 fte job, while downstream activities were estimated to lose less than 1 fte job. Flow-on business activity was estimated to lose a less than 1 fte job, while the total loss in employment is 2 fte jobs.

Contribution to GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. The loss in total Charter Boat fishing industry related contribution to GRP in the region is \$0.12m, \$0.05m lost by fishing directly, \$0.02m in downstream activities and \$0.04m lost in other sectors of the state economy.

There is uncertainty associated with estimates of displaced historical Charter Boat effort and catches from sanctuary zones because of the limited spatial data available for the fishery. It is likely that the SARDI method will underestimate the effect on Charter Boat catches in marine fishing blocks where sanctuary zones cover hot spot areas, and likewise the converse may be the case. In fishing blocks where there are numerous hot spots, or where effort is spread evenly across the block, the impact of a sanctuary zone would be more accurately represented by the SARDI method (PIRSA pers. comm., 29 September 2011).

According to the Surveyed Charter Boat Owners and Operators Association of South Australia (pers. comm., 18 June 2012), the sanctuary zones are often concentrated in hot spot areas (in particular SZ-5, SZ-8 and SZ-11 in this marine park) and the SARDI method will underestimate the effect on Charter Boat effort. The issues associated with estimating charter boat effort are compounded by the fact that the Charter Boat Fishery is a multi-species fishery, with a varied targeting of site-attached and non-site-attached species.

Where fishing grounds are lost to sanctuary zones, fishers will have to change fishing patterns as areas that were previously available to them will no longer be accessible. Knowledge of good fishing areas will need to be rebuilt (Surveyed Charter Boat Owners and Operators Association of South Australia, pers. comm., 18 June 2012).

This readjustment may involve covering greater distances to get to sites further away from their base and to search more to catch fish. This is likely to be a short-term adjustment issue. Operators with smaller boats will be restricted by the range of their boats ((Surveyed Charter Boat Owners and Operators Association of South Australia, pers. comm., 18 June 2012). For operators with larger boats there may be increased operating costs (e.g. additional fuel for increased travel) which would lead to increased prices for passengers or a fall in profitability. The financial position of Charter Boat Fishery licence holders is already precarious (EconSearch 2012, p.12); the implications of increased costs and reduced catches are likely to seriously undermine the financial sustainability of the more marginal operators.

4.2.1.10 Sharks¹⁰

The Gillnet, Hook and Trap sector of the Commonwealth Southern and Eastern Scalefish and Shark Fishery operates in the Encounter Marine Park. The fishery occurs predominantly in Commonwealth waters and therefore is managed by Australian Fisheries Management Authority under an Offshore Constitutional Settlement. Target species are school and gummy sharks. A preliminary estimate of an average catch of 12 kg per year will be displaced from the line fishing sector by sanctuary zones in this park. This sanctuary zone catch represents 0.08 per cent of the fishery catch in State waters, and less than 0.01 per cent of the fishery catch off SA (State and Commonwealth waters).

4.2.2 Aquaculture

There are no known current or potential impacts expected from the draft zoning on current or future aquaculture enterprises in marine parks. This is consistent with Government policy commitments. Any potential future prescribed criteria in aquaculture

¹⁰ Australian Fisheries Management Authority data shows no reported catch by the Southern Bluefin Tuna fishery or Great Australian Bight trawl fishery in South Australian state waters for the period 2001-2010. No impact from the draft zoning is anticipated on these fisheries.

zone polices derived from Section 11 (3a) of the *Aquaculture Act 2001* could add cost to existing or future aquaculture activities, or have additional regulatory impact (PIRSA, pers. comm., 7 November 2011). However, no such prescribed criteria currently exist and potential impacts have not been assessed.

4.2.3 Property Prices

Given that the overall impact on the region is not expected to be large in absolute terms, the impact on property values is, similarly, not expected to be significant. States of Australia have introduced marine parks with sanctuary zones in the last decade without any known long-term effects on property values. External factors notwithstanding, the trend in Fleurieu and Coorong and Kangaroo Island residential property prices illustrated in the regional socio-economic profiles is unlikely to be affected by the proposed marine park zoning.

4.2.4 Tourism

The following assessment is based on discussions with the South Australian Tourism Commission, local councils and local offices of Regional Development Australia.

As discussed in section 4.3.5.2, the actual placement of sanctuary zones is unlikely to place real restriction on recreational fishing in the majority of popular fishing locations. However the perception that recreational fishing opportunities will be restricted by implementing 'no take' zones is real (for example, the charter boat industry has identified that they have benefited from an increased number of interstate clients in recent years who come to South Australia to fish because SA waters do not have marine park 'no take' zones). So there is potential for a downturn in fishing-based tourism in the short-term until visitors are informed and convinced of the actual situation on the water.

At least one ecotourism business operates in this park. It is an industry in its infancy and is expected to grow, however is unlikely to grow into a large industry because of the natural limitations of rough seas, cold water and sharks. Several organisations raised the issue of operator permits being a key factor in the ability of the industry to grow. In the past, one-year, renewable permits (issued under the *National Parks and Wildlife Act 1972*) were available which is viewed as a barrier to investment in this area. The permitting policy is being changed, with far greater flexibility on the length of time permits can be held, ranging from two-month permits up to 10-year permits¹¹ which is seen as likely to boost business investment. There will be situations where eco-tourism operations will occur within sanctuary zones which may benefit from zoning by, for example, not having to share the space with fishers. In the long-term managed marine parks will provide certainty that the marine environment within them is being protected and this is likely to support the ecotourism industry, provided the necessary investment in tourism infrastructure and support services is undertaken.

Other, non-extractive tourism, such as diving, is likely to benefit from the implementation of sanctuary zones however more detailed assessment has not been possible.

¹¹ See DEWNR's current *Commercial Tour Operators' Licensing and Permitting Policy* at http://www.environment.sa.gov.au/parks/Get_Involved/Commercial_Tour_Operators

4.2.5 Port, Harbour and Shipping Operations

The existing arrangement where shipping, ports and harbour activities are managed pursuant to the *Harbours and Navigation Act 1993* will remain. This includes dredging and channel maintenance, development or improvement of facilities for anchorage, vessel maintenance, loading, unloading and storage of goods, associated commercial and industrial development, sporting and recreational purposes. Under the Government policy commitment on shipping and harbours, all harbours declared under provisions of the *Harbours and Navigation Act 1993* will be zoned special purpose areas. Current and future operations in harbours will not be affected and have been accommodated within marine parks as reflected in the draft management plan zoning.

The shipping industry has suggested that marine park zoning may place potential restrictions on port, harbour and shipping facilities through zoning restrictions. The draft management plans have been prepared in such a way as to minimise any such restrictions and all ports have been excluded from marine parks.

It should be noted that aids to navigation and markers are permitted in any waters in any marine park.

The following harbours are zoned special purpose areas, and their operation is not expected to change:

- Rapid Bay
- Cape Jervis
- Victor Harbor
- Kingscote
- American River
- Penneshaw

In addition, the Murray Mouth has been zoned as a special purpose area to enable dredging to occur. GMUZ-5 off Kangaroo Island caters for growing cruise ship activity, the Cape Jervis to- Penneshaw ferry operations and potential export activities off Ballast Head. An expansion proposal by Adelaide Brighton Ltd at Rapid Bay has also been accommodated through zoning.

No significant impacts on shipping activities arising from the zoning in this park are expected, which is consistent with Government policy commitments.

4.2.6 Mining

The existing arrangements where DMITRE Minerals and Energy Resources Division oversee activities that support the mineral, petroleum and geothermal resource industries, pursuant to the *Mining Act 1972*, the *Petroleum and Geothermal Energy Act 2000*, the *Offshore Minerals Act 2000* and the *Petroleum (Submerged Lands) Act 1982*, will remain. All existing licences and leases will be accommodated with no change to existing conditions. Applications for new or renewal of licences and leases within and adjacent to marine parks will require the concurrence of the Minister responsible for marine parks under related amendments to the *Mining Act 1972* and the *Petroleum and Geothermal Energy Act 2000*. Where the proposed activity is consistent with the zoning regulations, no further approvals or permits will be required, apart from those required under legislation administered by DMITRE Minerals and Energy Resources Division.

Section 19 of the *Marine Parks Act 2007* provides for consideration of activities that are inconsistent with marine park zoning regulations on a case-by-case basis with rigorous assessment and approval processes and due consideration of risk to environmental values (e.g. to consider new/emerging lower impact technologies). The Minister responsible for marine parks will be required to issue a special permit in such cases.

There is a petroleum exploration licence partially overlapping this marine park, extending offshore north of Christies Beach, across to Kangaroo Island and into parts of Gulf St Vincent. There are numerous private mines adjacent to the park for sand and limestone between Moana and Rapid Head, and one mineral exploration licence application immediately adjacent to the marine park.

As mentioned above, conditions attached to existing licences will not change and the operations to which these licences refer to will not be affected by zoning. Licence applications will be required to go through a joint approval process administered by DMITRE and DEWNR, which may be a potentially lengthier and therefore more costly process to the applicant. Zoning limits the types of exploration activities permitted, and could potentially discourage certain types of applications and hence limit exploration and exploitation of resources. However no examples have been highlighted.

4.2.7 Coastal Development

Marine parks will not prevent coastal developments approved under the *Development Act 1993*. Coastal developments and infrastructure are regulated under the provisions of the *Development Act 1993* with developments considered on a case by case basis by the relevant authorities to ensure that the achievement of the objects of the *Marine Parks Act 2007* and the aims of the specific zone where the development is proposed are supported appropriately. As part of the assessment process, advice or direction may be required from the Coast Protection Board and/or the Environment Protection Authority and other authorities, depending on the nature of the development. Development plans and significant projects are informed by the Planning Strategy which now includes the objects of the *Marine Parks Act 2007*.

The proclamation of the marine parks network will not affect access to, or use of, jetties, breakwalls or boat ramps.

Submarine electricity cables, zoned as a Special Purpose Area, run from 1.5 km either side of the line joining Fishery Beach (south of Cape Jervis) and Cuttlefish Bay (east of Penneshaw).

Transshipment of woodchips from Ballast Head off American River (proposed GMUZ-5) is planned from 2017. No foreseeable impacts are expected.

4.3 Social

4.3.1 Summary of method

The social impact assessment drew on multiple sources of information – a review of research relating to established marine parks elsewhere in Australia and overseas; an analysis of market research undertaken in relation to South Australian marine parks; an analysis of MPLAG minutes and of media reports relating to each park, a review of the

social values statement prepared for the park, and analysis of the economic impacts identified.

Finally a Marine Parks Social Impact Assessment Tool (MPSIAT) was designed which sought feedback from MPLAG members on different types of social impact expected to flow from preliminary zoning options considered prior to the draft zones presented within the draft management plans.

The findings from these different sources were analysed separately and in combination to determine overall expected social impacts.

Although this report presents impact analysis relating to the draft zones, the MPSIAT findings are included because they represent part of the community consultation process and the draft zones reflect the SA government's response to the findings of that process.

Eighteen of 28 members¹² (64 per cent) of the Fleurieu and Kangaroo Island MPLAGs responded to the online social impact assessment for the Encounter Marine Park.

4.3.2 Expected social impacts – at a glance

The overall social impacts of the Encounter Marine Park on communities living in the Fleurieu and Coorong region and on Kangaroo Island are expected to be high for fishing families given the magnitude of the economic impacts that have been projected and low to moderate for the community as a whole. Commercial fishing is estimated to contribute 86 jobs to employment in the Fleurieu and Coorong region and a further 74 jobs on Kangaroo Island. Economic impact assessment identifies a loss of 28 commercial fishing-related jobs in a region of high unemployment and moderate levels of measured relative disadvantage. Furthermore, most fishing operations, such as charter boats, are located in small fishing and tourism orientated settlements (e.g. Cape Jervis) where the relative impacts of reduced economic activity could be quite high. The State Government has committed to buy out licences and quota entitlements to offset any unsustainable displaced effort and catch. Although details of the buyout are yet to be finalised, any such payments have the potential to at least partially offset the negative impacts outlined above. The impact on recreational fishing is considered to be low to moderate with adjustments in zoning designed to minimise any potential negative impacts.

A critical factor in determining the ultimate impact of marine parks is how well local communities are able to adapt to change and how cohesive they are in supporting each other through change. Feedback provide for the social impact assessment indicates that local communities are expected by most to be sufficiently resilient to manage these changes brought about by marine park zoning.

Experience elsewhere in Australia and internationally (Ledee *et al* 2011, Cocklin *et al* 1998), suggests that a range of benefits will become evident over time. These include increased opportunities for education about marine life and conservation, and increased tourism and ecotourism opportunities. Experience elsewhere indicates that these benefits usually take approximately five years to be evident, and that in the earliest stages of marine protected areas being developed, communities are more likely to identify possible negative impacts than potential benefits. It takes time to

¹² Any MPLAG members who indicated they did not wish to participate in the social impact assessment a priori were not approached.

observe how the park's ecological and economic impacts evolve, with social impacts (positive or negative) flowing from these.

Certainly at this stage of the South Australian marine parks' development, monitoring of media reports, feedback from MPLAGs and analysis of their meeting discussions, illustrates the trend to expect the changes associated with their development to be problematic. One very important factor that affects community attitudes is how informed they are, and feedback from market research and MPLAGs, as well as analysis of media reports indicates a gap in this information. In particular, increasing communities' understanding of the scientific rationale underpinning marine protected areas, and the benefits that these can bring, needs to be enhanced.

Marine parks have broad support in the South Australian community. Market research commissioned by the state government between 2006 and 2012 (McGregor Tan Research 2006, 2007, 2008 and 2009; Square Holes 2009, 2011 and 2012) found strong support for the concept of marine parks among South Australians with approximately 85 per cent in favour of them in 2012 (87 per cent support in metropolitan Adelaide and 82 per cent support in regional areas). People interviewed for this research were able to identify seven main benefits arising from marine parks:

1. preservation of the environment for future generations
2. protection and conservation of marine habitats and wildlife
3. increases in fish stocks
4. greater opportunities for scientific research and education
5. greater opportunities for nature based tourism and recreation
6. protection of cultural and heritage sites
7. greater certainty for marine industries and users.

The research found in 2011 and again in 2012 that 88 per cent believe that protection of the marine environment through managed marine parks is the responsibility of current generations for the benefit of future generations.

The market research found that loss of commercial benefits is a particular concern, particularly for those living in regional areas (33 per cent in 2012) compared with those in metropolitan Adelaide (22 per cent in 2012). Those least likely to support marine parks have been fishing groups (in 2009 55 per cent of respondents who did not support marine parks identified restricted fishing as the reason, this dropped to 39 per cent in 2012).

Between 2011 and 2012 the market research findings identify a decline in those who believe they will have limited access to marine parks and an increase in those who associate swimming, boating and snorkelling with marine parks.

4.3.3 Education and Wellbeing

MPSIAT respondents were divided about whether the marine park MPLAG zoning would provide increased opportunities for education about marine life or improve understanding about marine conservation issues. International research findings confirm that this is a key outcome and benefit of marine protected areas (Angulo-Valdes and Hatcher 2010). Approximately half of MPSIAT respondents believed the

park zoning would improve neither their quality of life nor that of the people in their community.

The draft zoning proposal is the result of considerable discussion about how potential negative impacts on users of marine resources in the marine park can be minimised. For this reason it is expected that personal quality of life in general and quality of community life is unlikely to be negatively impacted by the draft zoning proposal.

4.3.4 Culture and Heritage

DEWNR undertook a process of consultation with Aboriginal stakeholders about the establishment of the marine parks. No significant negative impacts on Aboriginal communities were identified. However, it is important that further consultation be undertaken in relation to the likely impact of the draft zoning.

Aboriginal people have interacted with the marine environment for thousands of years and their relationships with the sea remain strong through customs, laws and traditions. Traditional usage, Aboriginal cultural heritage, Indigenous Protected Areas, Indigenous Land Use Agreements and Native Title considerations are being taken into account in developing the management plan for the Encounter Marine Park.

The Kurna and Ngarrindjeri Aboriginal people have traditional associations with areas of the marine park including estuarine and coastal environments, which provide food and resources for local Aboriginal people and still hold strong cultural significance today. Both the Kurna (2000) and Ngarrindjeri (1998) people have lodged native title claims that include parts of the Encounter Marine Park. Both Kurna and Ngarrindjeri people have distinctive languages, customs and creation stories which are depicted in well known creation stories such as Tjilbruke (Kurna) and Ngurunderi (Ngarrindjeri).

Kangaroo Island is believed to contain many cultural heritage sites from the period when the island was connected to the main land, as well as more recently from the early 19th century when many Aboriginal women were taken to Kangaroo Island from Kurna, Ngarrindjeri and Tasmanian Aboriginal groups by sealers and whalers.

The majority of MPSIAT respondents did not expect the marine park MPLAG zoning would help maintain local Australian culture and heritage or local community identity as a fishing centre. The impact on community identity is too early to determine at this stage, but given the low to moderate impact expected on fishing, it is unlikely that their negative expectations will be realised. Furthermore, there will be different groups within the community with varying degrees of attachment to identity as a fishing centre, just as there will be a range of views about being identified as a place of ecological value.

4.3.5 Recreation and Fishing

4.3.5.1 Recreation

A minority of MPSIAT respondents expected that the proposed MPLAG zoning would encourage more recreational activity, a greater range of recreational activities and improved recreational facilities (see Appendix Table 4-4).

4.3.5.2 Recreational Fishing

The following assessment is based mainly on the SAMPIT mapping¹³, with material from separate interviews with the South Australian Recreational Fishing Advisory Council (SARFAC) and the DEWNR project coordinators who facilitated the MPLAG process, where appropriate.

Recreational fishing occurs:

- Off Port Noarlunga Reef Aquatic Reserve. SZ-2 is in a lightly fished area. The current arrangements which allow recreational fishing from the Port Noarlunga jetty will continue as will shore-based recreational line fishing along the Port Noarlunga-Southport beach.
- Off Aldinga Reef Aquatic Reserve. SZ-3, adjacent to a popular fishing spot, is in a lightly fished area and will have limited impact on boat based fishing.
- From Sellicks Beach around Cape Jervis and into Deep Creek Conservation Park. SZ-4, off Carrickalinga, is in a popular fishing area and will impact fishing. SZ-5, off Rapid Head, is in a popular fishing area too, but as fishing can occur within Rapid Bay the impact on recreational fishing and the camping facilities there is expected to be limited.
- Off Newland Head Conservation Park. There is no sanctuary zone proposed for this area.
- In Encounter Bay. SZ-6, off Basham Beach Regional Park, is in a moderately fished area and will allow shore-based recreational line fishing, so impact will be limited.
- Along the Goolwa Coorong. According to Alexandrina Council (pers. comm., 26 September 2011), tourism is a major industry within the Alexandrina Council area and is heavily focused on marine activities, especially recreational scale fishing by both shore and boat. The region is well known as a recreational fishing area for gathering Goolwa cockles or catching Coorong mullet and larger scale fish e.g. Mulloway, Bream, Snapper and Crayfish. The Goolwa Coorong is an important shore fishing and boat fishing area for scale fish and cockle gathering area along the coast line, attracting visitors from all over Australia. This industry supports many business operators including recreational boating, commercial shops and tourism accommodation. SZ-7 is believed to be hard to access from the shore and is not expected to impact on shore-based recreational fishing (SARFAC, pers. comm., 20 June 2012).
- Around Kingscote. SZ-8, in the Bay of Shoals, is in a lightly fished area that is adjacent to a very popular fishing area around Kingscote and impact is expected to be limited.

¹³ The South Australian Marine Parks Information Tool (SAMPIT) is a computer tool designed to gather information from community members about their favourite fishing spots and areas they believe need protection. Data is collected and reported by 'grid cell'. SAMPIT data for 1,739 people is available including 1311 recreational fishers. Quality control by the Department of Environment and Natural Resources included cross-verification of legitimate naming and activities from the data provided (DENR 2010b).

- From the south eastern end of Western Cove and into Eastern Cove, Penneshaw area, and from Penneshaw around to Antechamber Bay to Cape Willoughby. SZ-9 covers the American River Aquatic Reserve where fishing is not permitted, so there will be no impact. SZ-10, north of Lashmar Conservation Park, is in a moderately fished area and will have some impact on fishing.
- Around the Pages. SZ-11 covers the North Pages. Recreational fishers can still access the waters off the South Pages, limiting impact.

Overall the management plan zoning is expected to have low to moderate impact on recreational fishing, with sanctuary zones over highly fished areas limited.

4.3.5.3 Commercial Fishing

The overall social impacts of the Encounter Marine Park on communities living in the Fleurieu and Coorong region and on Kangaroo Island are expected to be high for fishing families given the magnitude of the economic impacts that have been projected and low to moderate for the community as a whole. Commercial fishing is estimated to contribute 86 jobs to employment in the Fleurieu and Coorong region and a further 74 jobs on Kangaroo Island. Economic impact assessment identifies a loss of 28 commercial fishing-related jobs, in a region with high levels of unemployment and moderate levels of measured relative disadvantage. Furthermore, most fishing operations, such as charter boats, are located in small fishing and tourism orientated settlements (e.g. Cape Jervis) where the relative impacts of reduced economic activity could be quite high. The State Government has committed to buy out licences and quota entitlements to offset any unsustainable displaced effort and catch. Although details of the buyout are yet to be finalised, any such payments have the potential to at least partially offset the negative impacts outlined above.

The following potential social impacts have been identified for the prawn and marine scalefish fisheries.

Stock assessment and sustainable management of the prawn fisheries rely upon fishery-independent surveys. These provide information on abundance, spatial distribution and size composition of prawns prior to fishing operations. One survey stations are located within a proposed habitat protection zone in this park. As these surveys involve trawling, those stations that fall within sanctuary or habitat protection zones may be lost to future surveys and may require modification to the existing stock assessment methodology. If modification to the stock assessment process is required, this has the potential to introduce less certainty regarding interpretation of data, since relatively new information will be used (rather than the longer and more reliable time series) to underpin sustainable management of the fishery (PIRSA pers. comm. 29 September 2011).

It is likely that most marine scalefish licence holders that currently fish in areas where there are proposed sanctuary zones will be impacted by the zoning either from restricted access or from displaced fishers shifting effort into their patch. This could lead to higher levels of conflict and competition between licence holders, particularly haul netters who already operate in limited areas (PIRSA pers. comm. 29 September 2011). It could be expected that this type of conflict would be resolved over time and not persist into the medium to long-term.

Australian researchers have identified the potential psychological impacts on fishing families arising from uncertainty about fishing business viability, reduced family income, reduced self-esteem arising from the loss of fishing occupation and the difficulty of finding alternative employment in the region (Schirmer et al. 2004: 7-8). Much depends on individual fishers' capacity to adapt which in turn has been found to depend on their financial situation, ability to work elsewhere, business skills and willingness to accept rather than resist change (Marshall and Marshall 2007). This diversity means that fishers will vary significantly in the way marine parks affect them, and will have differing views on that impact, as is reflected in Appendix Table 4-4, Appendix 4.

Furthermore, there is minimal research on the social impacts of marine parks on commercial fishers and their families in particular, and on communities as a whole (Voyer 2011, 2012, Beeton et al 2012, Fairweather et al 2009). The Great Barrier Reef Marine Park Authority is cited as one exception to this trend (Voyer et al 2012, Beeton et al 2012) while social impact research has also been undertaken in relation to Ningaloo Marine Park in Western Australia (Northcote & Macbeth 2008).

By contrast, economic impacts of marine parks have been significantly more researched. Australian researchers have found that most commercial fishers have adapted their fishing activity and fishing business at least moderately well in the five years following implementation of the 2004 Great Barrier Reef Marine Park rezoning, leading them to conclude that many of the impacts experienced by fishers might be short-term and decline over time as fishers adapt to the change (Ledee et al. 2011: 8). Similarly, research undertaken in New Zealand's Leigh Marine Reserve has found that almost two decades after it was established in 1975, commercial and recreational fishers reported that fishing outside the boundaries had improved over time (Cocklin et al. 1998).

4.3.6 Local Government, Population and Housing

4.3.6.1 Local Government

Through the SA Regional Organisations of Councils, facilitated by the Local Government Association SA, all local government councils which border marine parks in SA were invited to participate in a survey about potential impact of marine park zoning on council operations, council infrastructure and council revenues.

Alexandrina Council responded, and raised concerns that if the DENR preliminary zoning proposal from November 2010 had been implemented it would have impacted on fishing tourism in the Goolwa area, which if it depressed property prices could impact on council revenues. No other impacts were envisaged.

As the proposed zoning is significantly reduced in the Goolwa-Coorong area and as shore-based recreational line fishing will continue to be permitted off Basham Beach (proposed SZ-6), it is expected that fishing tourism, property prices and hence council revenues should not be impacted.

4.3.6.2 Population and housing

Economic modelling has estimated a loss of 28 jobs from the fishing industry in the Fleurieu and Coorong region, with an impact of -0.10 per cent on overall employment. Unemployment in the Fleurieu and Coorong region is high when compared with the

state average and measured relative disadvantage if moderate, with a moderate to high proportion of single parent families. This suggests that alternative regional opportunities for unemployed labour will be difficult to find and any job losses will be real and unlikely to be absorbed into the local workforce. It can be expected that some of these job losses may result in one or more families leaving the region.

4.3.7 Community

A majority of MPSIAT respondents expected that the local community would adapt well to changes brought by the proposed zoning in the Encounter Marine Park, and that the community would be sufficiently resilient to manage changes brought by the park (see Appendix Table 4-6).

The majority of MPSIAT respondents did not expect business opportunities to increase as a result of the proposed zoning of the park, nor did they envisage the need for training programs to assist local people to transition to new occupations that may emerge from its establishment. However, thought should be given to training programs that assist people to manage changes brought by establishing the park. It is possible that new employment opportunities will emerge, and it will be important for local people to take advantage of those, with training being potentially important to their ability to do so.

A minority of MPSIAT respondents expected that the marine park would be a source of pride to the local community, and was likely to increase events and other activities that would bring the community together. A majority of MPSIAT respondents expected the park to become a source of division in the local community.

While there is little research evidence about the impacts of marine protected areas on communities as a whole, there are several studies in Australia and overseas that have identified a range of positive impacts, including enhanced tourism opportunities with flow on benefits to other sectors in the local economy (Ward et al. 2001, Cocklin et al. 1998). However, these and other benefits are not apparent in the early implementation stages and where positive impacts are reported these tend to be evident after about five years, becoming increasingly evident over the longer term (Cocklin et al. 1998, reporting on New Zealand marine parks established from 1975 onwards).

Given the limited impact expected on non-fishing commercial sectors and on recreational fishing, it is not likely that the proposed zoning will present significant adjustment pressures to the broader community, however there will be significant adjustment expected in the local commercial fishing sector.

4.3.8 SEIFA based analysis of impacts

Job losses in the Fleurieu and Coorong Impact Region are expected to be low in the range of approximately 28 fte (-0.1 per cent impact on the region). In an area of relatively high unemployment (8.1 per cent) and moderate relative disadvantage (SEIFA and leading indicators) this is likely to have a greater social impact where alternative employment opportunities are limited.

The social impact is therefore expected to be low to moderate in the areas associated with the Encounter Marine Park.

Table 4-11 Social impact for Fleurieu and Coorong Impact Region

Impact region	Fleurieu & Coorong
Marine Park # and Name	15: Encounter
Jobs impact (fte)	-28
% impact on region	-0.10%
Regional unemployment	High (8.1%)
SEIFA relative disadvantage (SLA)	Moderate (Onkaparinga North Coast 891)
Index of Economic Resources (SLA)	Moderate (Onkaparinga North Coast 879)
Index of Education & Occupation (SLA)	Moderate (Onkaparinga North Coast 887)
Proportion of single parent families ^{b,c}	Moderate-high (Onkaparinga North Coast 13.9%, Onkaparinga South Coast 11.6%)
Proportion with education lower than year 12 ^{b,c}	High (The Coorong 63.4%)
Proportion of population with Indigenous background ^{b,c}	Moderate (The Coorong 5.5%)
% fair or poor health (self report)	Moderate-high (Onkaparinga North Coast 19.2%, Onkaparinga South Coast 17.8%)
Expected social impact	Low-moderate

Note 7 SLAs associated with Impact region

Note rounding errors do occur.

^a Impacts too small to model.

^b Source: Australian Bureau of Statistics (2007). *2006 Census Community Profile Series, South Australia (STE 4)*. Canberra: ABS

^c Source: Australian Bureau of Statistics (accessed 2012). *TableBuilder 2006 Census, South Australia (SLA)*. Canberra: ABS

^d Compiled by PHIDU using data estimated from the *2007-08 National Health Survey* (NHS), ABS (unpublished); and ABS Estimated Resident Population, average of 30 June 2007 and 2008

Note, an Impact Region or SLA is considered high if it has at least one SLA in the highest decile in SA (a moderate value falls in the second highest decile).

4.3.9 Next Steps in Social Impact Assessment

4.3.9.1 Short term objectives

Social impact research constantly identifies insufficient information as a cause of concern for communities affected by the establishment of marine parks, and notes how important such information can be for effective participation in the process of designing and implementing these parks. This includes better communication of the underpinning science of marine protected areas and how it has influenced their design and the setting of zones (Fairweather et al. 2009). The more recent review of marine parks in NSW (Beeton et al 2012) also found that insufficient community informing, and an associated lack of resourcing for this purpose, has resulted in marine parks-related decision making and the benefits of marine parks being insufficiently understood the general public. There is also research evidence of the importance of informed participation in marine park decision making and management, and in the enforcement of compliance (McPhee 2011, Cocklin et al. 1998).

In this context it is important to note that a range of information provision and consultation strategies were implemented by DEWNR to inform the marine parks decision making process. The SAMPIT and MPLAG processes provided an important

opportunity for key stakeholders to contribute to the design of the marine park. This impact assessment report is the foundation for a further community consultation process. Further details about the information provision and consultation processes undertaken by DEWNR are detailed in section 1.1.

A clear message from the market research, media reporting and feedback from MPLAGs is that the scientific arguments in favour of establishing marine parks, including the Encounter Marine Park, need to be better understood by the wider community. This is one of the functions of this impact statement which is designed to inform judgements on the impact of the draft zoning proposal. MPSIAT feedback indicates that those members who do not understand the scientific arguments, also tend to disagree that the park's boundaries and proposed zoning are based on sound science.

In their evaluation of New South Wales marine parks, Fairweather et al. (2009: 26) recommended to the Marine Parks Advisory Council of NSW that they be '*... more assertive about the science and other research behind the NSW Marine Park system ...*' partly to refute misinformation being spread by opponents of the parks but also to ensure levels of understanding were increased. Acknowledging community concerns about possible negative impacts on their lives, the researchers identified the importance of ongoing socio-economic impact assessment as one means of improving understanding of the value of marine protected areas to Indigenous, recreational and commercial users of marine parks, mainly because it can capture the economic and social benefits that develop over time (Fairweather et al. 2009: 15-17).

MPSIAT respondents expressed the need for more information about this marine park and how it will operate. Reliance on public forums, open days and processes that involve giving information rather than listening to local voices, have been criticised in local media. It is important to note that a range of information provision and consultation strategies were implemented by DEWNR to inform the marine parks decision making process. The SAMPIT and MPLAG processes provided an important opportunity for key stakeholders to contribute to the design of the marine park. This impact assessment report is the foundation for a further community consultation process. Further details about the information provision and consultation processes undertaken by DEWNR are detailed in section 1.1.

4.3.9.2 Ongoing impact assessment

Social impact assessment that is repeated over time, provides a mechanism for informing as well as engaging communities, involving them in decision making, and identifying and assisting with managing intended and unintended social consequences (Vanclay 2005). However coastal zone management is often criticised for a failure to facilitate effective community engagement in what has been termed a 'democratic deficit' (Vanclay 2012).

Perceptions of social impacts of change reflect knowledge, experience, values and roles. They provide a guide to possible but not certain impacts. To provide greater certainty about likely impacts we need to subject marine park zones to economic and environmental impact identification processes like those adopted in this impact assessment statement, repeating them over time to measure changes. The results of this process are necessary to inform judgments about the magnitude of social impacts.

The opportunity now exists for key stakeholders to provide perspectives on social impacts in the light of new knowledge about industry, employment, species and habitat impacts provided in this impact statement.

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Disclaimer

We have prepared the above report exclusively for the use and benefit of our client. Neither the firm nor any employee of the firm undertakes responsibility in any way whatsoever to any person (other than to the above mentioned client) in respect of the report including any errors or omissions therein however caused.

Appendix 1 Socio-economic Profile

This socio-economic profile provides a statistical summary of key economic and social information for the Fleurieu and Coorong, and Kangaroo Island regions and, where possible, South Australia (SA). The profile brings together a wide range of existing Australian Bureau of Statistics (ABS) data and some non-ABS data. It has been designed, at a broad level, to aid understanding of the economic and social structure of the region, to indicate how the Fleurieu and Coorong, and Kangaroo Island regions contribute to the State economy and to monitor trends in economic growth or decline.

Fleurieu and Coorong

The Fleurieu & Coorong region is located south of Adelaide (Figure 1). The six statistical local areas (SLAs) that comprise the region are Onkaparinga (C) – North Coast, Onkaparinga (C) – South Coast, Alexandrina (DC) – Coastal, Yankalilla (DC), Victor Harbor (C) and The Coorong (DC). The Fleurieu & Coorong regional economy is relevant to the Encounter marine park (MP15). Table 1 presents a summary of the key economic and social information detailed further in the report.

Appendix Figure 1–1 Fleurieu & Coorong region



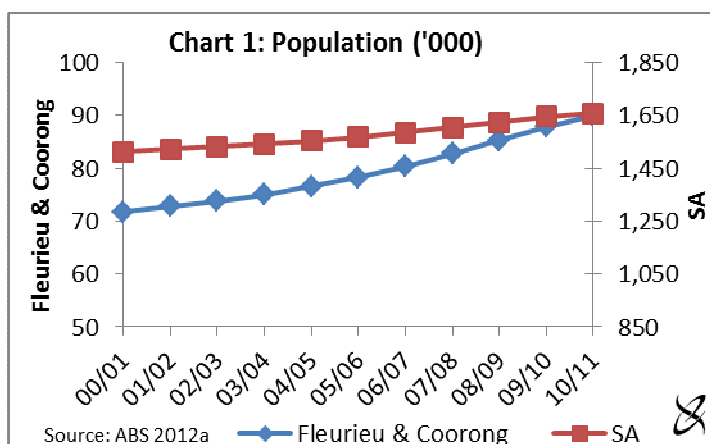
Source: ABS TableBuilder

Appendix Table 1-1 Summary of key economic and social indicators for the Fleurieu & Coorong region

Indicator	Fleurieu & Coorong	SA	Fleurieu & Coorong as a proportion of SA
Population, 2010/11 (no.)	89,980	1,656,299	5.4%
Birth Rate, 2009/10 (births/1000 residents)	12.3	12.2	-
Death Rate, 2009/10 (deaths/1000 residents)	8.6	7.9	-
Age Distribution, 2009/10:			
Proportion of Population aged 0-14	18%	18%	-
Proportion of Population aged 15-64	62%	67%	-
Proportion of Population aged 65+	20%	16%	-
Dependency Rate, 2009/10:			
Child	28%	27%	-
Aged	32%	23%	-
Total	60%	50%	-
Population Projection, Increase from 2006 to 2026	56%	23%	-
Employment, June qtr 2011:			
Labour Force (no.)	38,783	867,500	4.5%
Unemployed (no.)	3,140	45,300	6.9%
Unemployment Rate	8%	5%	-
Participation Rate, 2009/10	53%	63%	-
Businesses, June 2009 (no.)	5,735	141,625	4.0%
School Enrollments, 2011	13,196	247,356	5.3%
Tertiary Enrollments, 2011	9,612	208,706	4.6%
Non-school Qualifications, 2006	26,225	595,379	4.4%
Mean Taxable Income, 2009/10 (\$)	47,368	54,349	-
Proportion of Taxable Individuals, 2009/10	67%	74%	-
Value per Building Approval, 2010/11 (\$)	210,136	236,269	-
Median Dwelling Price, 2010/11 (\$)	326,250	357,500	-
Commercial Fishing, Ave/yr 2000/01 to 2009/10:			
Catch (t)	2,459	47,581	5.2%
Value of Catch (\$m)	10	202	4.8%
Charter Boats, Ave/yr 2007/08 to 2009/10 (no. of fish)	26,066	146,341	17.8%
Recreational Fishing, 2007/08:			
Fishers (no.)	47,777	236,463	20.2%
Days Fished (no.)	130,146	1,054,200	12.3%
Gross Regional Product, 2009/10 (\$m)	2,464	80,356	3.1%
Employment, 2009/10 (fte)	28,789	774,953	3.7%
Tourism, 2009/10 (\$m)	260	4,524	5.7%
Other Regional Exports, 2009/10 (\$m)	1,060	26,757	4.0%
Regional Imports, 2009/10 (\$m)	2,300	40,573	5.7%

Demographic indicators

- The estimated resident population of the Fleurieu & Coorong region increased by 25 per cent (approximately 18,200 persons) between 2000/01 and 2010/11 and was almost 90,000 persons in 2010/11. Over the same period SA experienced population growth of almost 10 per cent (Chart 1).
- A large increase in population, small increase in the birth and death rates (ABS 2011a,b) implies significant inward migration to the region over the period.
- Compared with the age distribution of the state as a whole, the Fleurieu & Coorong region has a similar concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and, consequently, a higher than average share of people aged 65 and over (Table 2).



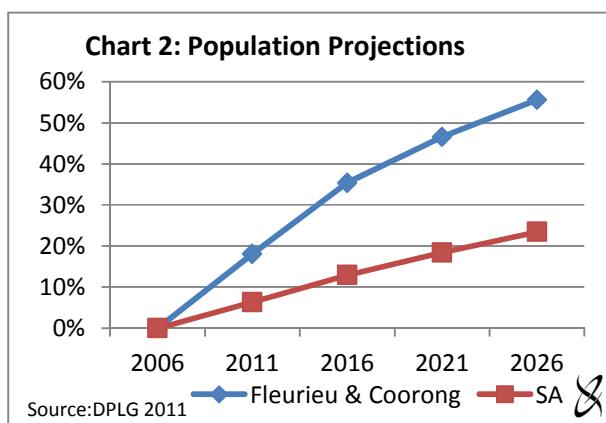
Appendix Table 1-2 Age distribution of the population for the Fleurieu & Coorong region and SA, 2000/01 to 2009/10

Age	Year									
	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Fleurieu & Coorong										
0 to 14	19%	19%	19%	18%	18%	18%	18%	18%	18%	18%
15 to 64	63%	63%	63%	63%	63%	63%	63%	63%	63%	62%
65 or older	18%	18%	18%	19%	19%	19%	19%	19%	19%	20%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
South Australia										
0 to 14	19%	19%	19%	19%	18%	18%	18%	18%	18%	18%
15 to 64	66%	66%	66%	66%	66%	67%	67%	67%	67%	67%
65 or older	15%	15%	15%	15%	15%	15%	15%	15%	15%	16%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: ABS 2010a and ABS 2011c

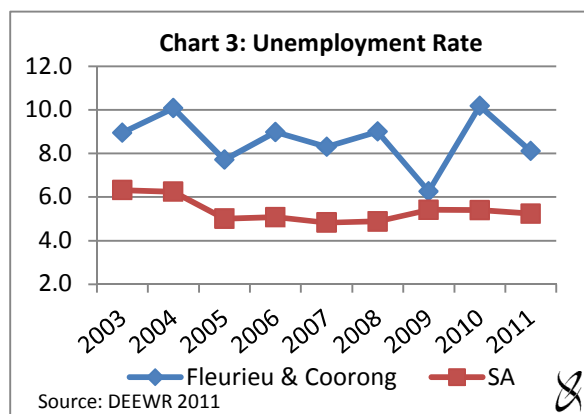
- The total dependency rate for the Fleurieu & Coorong region was 60 per cent in 2009/10. This implies that for any dependent person (persons aged 0 to 14 and over 65) there were less than 2 persons providing support. At the state level the dependency rate was 50 per cent in 2009/10 (ABS 2010a and ABS 2011c).

- According to the Department of Planning and Local Government (DPLG) population projections¹⁴, the total population in the Fleurieu & Coorong region is likely to increase by almost 56 per cent by 2026, whereas the SA population is expected to increase by less than half of that, around 23 per cent (Chart 2).
- Population projections for the Fleurieu & Coorong region for persons aged 0 to 14 years indicate that there will be an increase (52 per cent from 2006) in this age category. The working age population (15 to 64 years) is also projected to increase (by 44 per cent from 2006). The population projections for persons 65 or older indicate that a significant increase of almost 96 per cent in this age group is expected over the 20 years to 2026 (DPLG 2011).



Labour force indicators

- In the June quarter of 2011, the labour force in the Fleurieu & Coorong region was almost 38,800 (by place of residence), an increase of 24 per cent from the March quarter of 2003. By comparison, the labour force for SA increased by 14 per cent over the same period (DEEWR 2011).
- The number of unemployed persons in the Fleurieu & Coorong region was approximately 2,800 in March 2003 and 3,100 in June 2011, an increase of approximately 12 per cent over the period. By comparison, the number of unemployed persons in SA decreased by approximately 11 per cent over the same period (DEEWR 2011).
- The unemployment rate in the Fleurieu & Coorong region was 8.1 per cent in the June quarter of 2011. The unemployment rate for SA for the same quarter was significantly lower at 5.2 per cent (Chart 3).
- The labour force participation rate was consistently lower for the Fleurieu & Coorong region than for the whole of SA, over the years 2002/03 to 2009/10, reflecting the higher proportion of elderly people living in the Fleurieu & Coorong region. In 2009/10 the labour force participation rate in the Fleurieu & Coorong region was around 53 per cent compared to 63 per cent for SA as a whole (DEEWR 2011, ABS 2010a and ABS 2011c).



¹⁴ Population projections are not forecasts, they are based on ABS 2006 *Census of Population and Housing* resident population estimates and trends in mortality, fertility and overseas and interstate migration for South Australia. A range of estimates are published, based on the assumed level of migration. The 'medium level of migration' series has been utilised in this analysis. The method used to compile the projections was not influenced by local factors such as land availability or zoning, that is, it was assumed that these factors would not be limiting on population growth.

Business Count

- The total number of businesses operating at the end of June 2009 in the Fleurieu & Coorong region was 5,735, 4.0 per cent of the total businesses operating in SA (almost 142,000) (ABS 2011d).
- Of the 5,735 businesses operating in the Fleurieu & Coorong region, approximately 20 per cent were classified in the construction sector and 21 per cent were in the agriculture, forestry and fishing sector (ABS 2011d).
- Over 60 per cent of the businesses operating in the Fleurieu & Coorong region did not employ anyone and 20 per cent employed between 1 and 4 people (ABS 2011d).

Education and training

- The total number of residents in the Fleurieu & Coorong region with a non-school qualification increased over the 5 years to 2006. In 2006, approximately 42 per cent of all persons aged 15 or over held some form of non-school qualification, compared with 39 per cent in 2001 (ABS 2007 and 2010a).
- The level of qualification was generally lower for the Fleurieu & Coorong region than for SA, with the proportion of persons with a bachelor degree or higher being significantly lower (Table 3).

Appendix Table 1-3 Highest level of qualifications for persons aged 15 and over in the Fleurieu & Coorong region and SA, 2001 and 2006 ^a

Qualification	Fleurieu & Coorong			
	2001		2006	
Postgraduate Degree	291	1%	461	2%
Graduate Diploma & Graduate Certificate	424	2%	502	2%
Bachelor Degree	2,559	12%	3,201	12%
Advanced Diploma & Diploma	2,535	12%	3,393	13%
Certificate	9,979	46%	11,241	43%
Level of education not described or stated	6,143	28%	7,427	28%
Total	21,931	100%	26,225	100%
	South Australia			
	2001		2006	
Postgraduate Degree	15,203	3%	22,897	4%
Graduate Diploma & Graduate Certificate	14,361	3%	16,098	3%
Bachelor Degree	95,812	20%	120,979	20%
Advanced Diploma & Diploma	63,469	13%	79,698	13%
Certificate	185,129	38%	212,581	36%
Level of education not described or stated	115,200	24%	143,126	24%
Total	489,174	100%	595,379	100%

^a 2011 Census data on qualifications not available until the second release in October 2012.

Source: 2006 Census of Population and Housing (ABS 2007)

- The total number of students enrolled in primary school in the Fleurieu & Coorong region increased by 6 per cent between 2001 and 2011. This increase was comprised of an 11 per cent decrease in enrolments in government schools and a 75 per cent increase in enrolments at non-government schools (Table 4).
- The total number of Fleurieu & Coorong region students enrolled in secondary school increased by 9 per cent between 2001 and 2011. The rise was comprised of a 9 per cent decrease in government school enrolments and a 79 per cent increase in non-government school enrolments (Table 4).
- Between 2001 and 2011 the total number of Fleurieu & Coorong regions residents enrolled in a higher education institute increased by 78 per cent. This is significantly greater increase than for SA as a whole (38 per cent increase) (ABS 2012b).

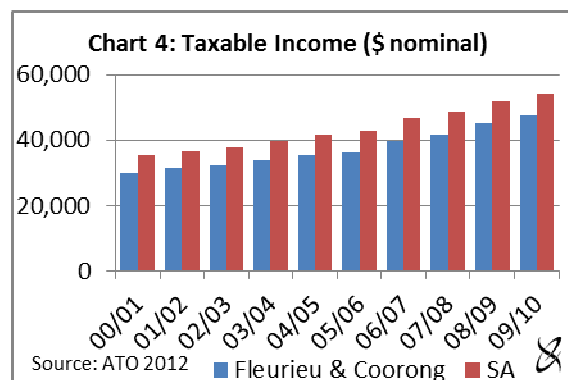
Appendix Table 1-4 School enrolment in the Fleurieu & Coorong region and SA, 2001, 2006 and 2011

	Census Year		
	2001	2006	2011
Fleurieu & Coorong			
Pre-school	813	892	1,058
Primary			
- Government	5,714	5,111	5,094
- Non-Government	1,377	1,649	2,415
Total Primary Student	7,091	6,760	7,509
Secondary Students			
- Government	3,424	2,954	3,123
- Non-Government	839	1,201	1,506
Total Secondary Students	4,263	4,155	4,629
South Australia			
Pre-school	18,246	18,533	20,537
Primary			
- Government	103,975	93,220	87,542
- Non-Government	43,150	45,796	48,634
Total Primary Student	147,125	139,016	136,176
Secondary Students			
- Government	57,770	51,752	51,901
- Non-Government	31,725	35,172	38,742
Total Secondary Students	89,495	86,924	90,643

Source: 2011 Census of Population and Housing (ABS 2012b)

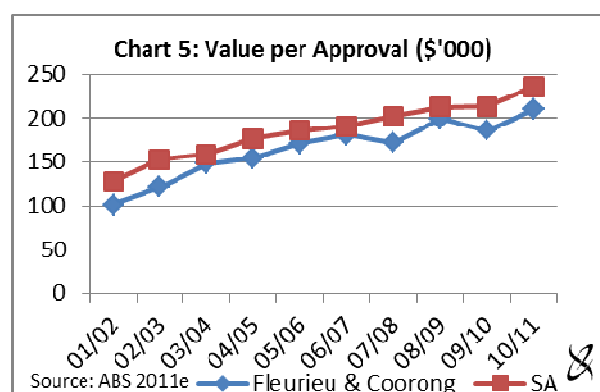
Household income

- The mean individual taxable income in the Fleurieu & Coorong region was consistently lower than the state average between 2000/01 and 2009/10 (Chart 4).
- Over the period 2000/01 to 2009/10, the mean taxable income (in nominal terms) increased by 59 per cent in the Fleurieu & Coorong region and 54 per cent in SA as a whole (Chart 4).
- In 2009/10 mean taxable income was almost \$47,400 in the Fleurieu & Coorong region and around \$54,350 in SA (Chart 4).



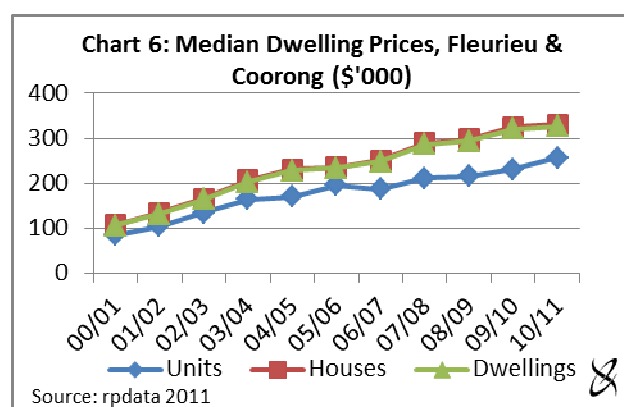
Building approvals

- The number of building approvals for the Fleurieu & Coorong region increased by 3 per cent over the period 2001/02 to 2010/11. However, the total value of approvals increased significantly more from \$121 million in 2001/02 to \$256 million in 2010/11, an increase of 112 per cent (ABS 2011e).
- For SA the total number of approvals was 3 per cent greater in 2010/11 than in 2001/02, while the total value was 90 per cent higher (ABS 2011e).
- The average value per approval in the Fleurieu & Coorong region increased by approximately 107 per cent, from \$102,000 in 2001/02 to \$210,000 in 2010/11 (Chart 5).
- For SA, the value per approval increased from \$128,000 in 2001/02 to \$236,000 in 2010/11, an increase of 85 per cent (Chart 5).



Property Values

- Between 2000/01 and 2010/11 the median unit price in the Fleurieu & Coorong region increased by 201 per cent, from \$85,000 to \$256,000 (Chart 6). The median unit price in SA as a whole increased by 215 per cent over the same period, from almost \$102,000 to \$320,000 (rpdata 2011).
- The median house price in the Fleurieu & Coorong region increased by 206 per cent between 2000/01 and 2010/11, from almost \$108,000 to \$330,000 (Chart 6). In comparison, house prices in SA as a whole increased at a lower rate, from \$126,000 to \$370,000 over the same period, a 194 per cent increase (rpdata 2011).
- Overall, median dwelling (units and houses) prices increased by 209 per cent in the Fleurieu & Coorong region (\$326,250 in 2010/11) and 197 per cent in SA as a whole (\$357,500 in 2010/11) over the period 2000/01 to 2010/11 (rpdata 2011).



Commercial fishing

- The average annual catch of Lakes and Coorong species in the Fleurieu & Coorong region over the past 10 years, 2000/01 to 2009/10, was around 2,075 tonnes. The value of this average annual catch was around \$4.4 million (SARDI by special request).
- Annual catch of rock lobster in the Fleurieu & Coorong region averaged around 9 tonnes with a beach value of approximately \$330,000 over the period 2000/01 to 2009/10 (SARDI).
- Annual average catch of Marine Scalefish species including miscellaneous species in the Fleurieu & Coorong region over the period 2000/01 to 2009/10 was approximately 231 tonnes with a beach value of around \$1.0 million (SARDI).
- Between 2007/08 and 2009/10 the charter boat operators in the Fleurieu & Coorong region caught on average approximately 26,000 fish per annum (SARDI). This compares to an annual average catch for SA of 146,000 fish over the same period (PIRSA 2010).

Recreational Fishing

- Between 2000/01 and 2007/08 the total number of SA resident recreational fishers (those aged 5 and older) in the Fleurieu & Coorong region (region 19 in the report South Australian Recreational Fishing Survey 2007/08 (Jones 2009)) decreased by 34 per cent, from almost 73,000 in 2000/01 to around 48,000 fishers in 2007/08.
- Similarly, at the state level the number of SA resident recreational fishers decreased from an estimated 317,200 in 2000/01 to around 236,500 fishers in 2007/08 (a 25 per cent decrease) (Jones 2009).
- A similar pattern occurred in the total number of days fished by SA resident recreational fishers. In the Fleurieu & Coorong region the number of days fished by SA resident recreational fishers decreased from almost 200,000 days in 2000/01 to around 130,000 days in 2007/08 (a 35 per cent decline) (Jones 2009).
- For SA as a whole, the total number of days fished by SA resident recreational fishers almost halved over the seven years, from 1.83 million days in 2000/01 to 1.05 million in 2007/08 (Jones 2009).

Economic Contribution of Tourism to the Region

In aggregate, it was estimated that expenditure by tourists in the Fleurieu & Coorong region in 2009/10 (almost \$260m (TRA 2011 and EconSearch analysis)) generated the following level of regional economic and demographic activity.

- Approximately \$135 million in GRP which represents 5.5 per cent of the regional total (\$2.5 billion).
- Approximately 2,670 full-time and part-time jobs which represents 8.5 per cent of the regional total (31,400 total jobs).
- Approximately 2,165 fte jobs which represents 7.5 per cent of the regional total (28,800 fte).

Regional Economic Structure

- At the time of the 2006 population census it was estimated that approximately 53 per cent of the jobs in the region were held by local residents and the balance were held predominantly by residents of adjacent regions (i.e. travelled to work from the surrounding SLAs). Approximately 58 per cent of employed residents were employed locally, with the balance travelling to other areas in SA for work including a significant proportion in the Adelaide CBD and surrounding areas¹⁵)
- It was estimated that there were approximately 31,400 jobs (28,800 fte jobs) in the Fleurieu & Coorong region in 2009/10 (by place of remuneration) (Table 5).
- In 2009/10, the top four contributors to total jobs in the region were the retail trade (19 per cent each), manufacturing (16 per cent), health and community services (13 per cent) and building and construction (8 per cent) sectors (Table 5).
- The Fleurieu & Coorong gross regional product (GRP) was estimated to be \$2.46 billion in 2009/10 (Table 6). This compares with gross state product (GSP) in the same year of \$80.36 billion (ABS 2010b).
- The GRP of the Fleurieu & Coorong region comprised approximately 3.1 per cent of the SA GSP.
- In 2009/10, the top four contributors to GRP were the manufacturing (14 per cent), ownership of dwellings (13 per cent), agriculture, forestry and fishing and building and construction (8 per cent each) sectors (Table 6).
- Expenditure by households accounted for one third of the total value of goods and services imported into the region in 2009/10. Among of the intermediate sectors, the top importers in the region in 2009/10 were the manufacturing (18 per cent) and building and construction (9 per cent) sectors (Table 7).
- Expenditure by tourists (\$260m) contributed approximately 20 per cent of the total value of exports from the region in 2009/10 (Table 7).
- The top contributors to the value of 'other exports' from the region in 2009/10 were the manufacturing (44 per cent), agriculture, forestry and fishing (21 per cent) and building and construction (11 per cent) sectors (Table 7).

¹⁵ Based on detailed 'journey to work' employment data obtained from the ABS 2006 Census of Population and Housing using the TableBuilder database.

Appendix Table 1-5 Employment, household income and household expenditure, Fleurieu & Coorong region, 2009/10 ^a

SECTOR	Total Employment		FTE Employment		Household Income		Household Expenditure	
	(jobs)	(%)	(fte)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	2,052	6.5%	2,253	7.8%	80	6.0%	11	0.5%
Mining	85	0.3%	103	0.4%	10	0.7%	14	0.6%
Manufacturing	5,052	16.1%	5,274	18.3%	82	6.2%	73	3.3%
Electricity, gas and water	145	0.5%	149	0.5%	128	9.6%	64	2.9%
Building and construction	2,411	7.7%	2,494	8.7%	25	1.8%	25	1.1%
Wholesale trade	1,078	3.4%	1,137	3.9%	0	0.0%	0	0.0%
Retail trade	5,952	19.0%	4,509	15.7%	6	0.5%	11	0.5%
Accommodation, cafes & restaurants	1,955	6.2%	1,523	5.3%	49	3.7%	1	0.0%
Transport and storage	1,034	3.3%	1,099	3.8%	331	24.8%	403	18.2%
Communication services	186	0.6%	185	0.6%	37	2.8%	30	1.4%
Finance and insurance	449	1.4%	415	1.4%	3	0.3%	2	0.1%
Ownership of dwellings ^b	0	0.0%	0	0.0%	7	0.5%	2	0.1%
Property and business services	1,707	5.4%	1,553	5.4%	168	12.6%	432	19.5%
Public administration and defence	1,559	5.0%	1,526	5.3%	103	7.8%	17	0.7%
Education	2,247	7.2%	2,071	7.2%	96	7.2%	43	1.9%
Health and community services	3,911	12.5%	3,178	11.0%	153	11.5%	64	2.9%
Cultural and recreational services	532	1.7%	378	1.3%	12	0.9%	22	1.0%
Personal services	1,038	3.3%	942	3.3%	43	3.2%	47	2.1%
Total Intermediate	31,393	100.0%	28,789	100.0%	1,333	100.0%	1,261	56.8%
PRIMARY INPUTS								
Household Income	-	-	-	-	-	-	0	0.0%
GOS and GMI ^c	-	-	-	-	-	-	0	0.0%
Taxes Less Subsidies	-	-	-	-	-	-	194	8.7%
Imports	-	-	-	-	-	-	763	34.4%
Primary Inputs Total	-	-	-	-	-	-	957	43.2%
GRAND TOTAL	31,393	100.0%	28,789	100.0%	1,333	100.0%	2,218	100.0%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a), EconSearch (2009a,b) and EconSearch analysis.

Appendix Table 1-6 Components of gross regional product in the Fleurieu & Coorong region by industry, 2009/10 ^a

SECTOR	Household Income		GOS and GMI ^c		Taxes less Subsidies		Gross Regional Product	
	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	78	5.9%	103	12.7%	8	7.1%	189	7.7%
Mining	7	0.5%	24	3.0%	0	0.2%	31	1.3%
Manufacturing	234	17.6%	101	12.5%	13	12.2%	348	14.1%
Electricity, gas and water	12	0.9%	10	1.2%	1	0.5%	22	0.9%
Building and construction	142	10.7%	39	4.8%	8	7.4%	189	7.7%
Wholesale trade	61	4.6%	18	2.2%	6	5.6%	85	3.4%
Retail trade	115	8.6%	36	4.4%	7	7.0%	159	6.4%
Accommodation, cafes & restaurants	62	4.6%	16	1.9%	8	8.0%	86	3.5%
Transport and storage	47	3.6%	41	5.1%	6	5.6%	94	3.8%
Communication services	18	1.3%	21	2.6%	2	1.5%	41	1.7%
Finance and insurance	51	3.8%	37	4.5%	5	4.6%	93	3.8%
Ownership of dwellings ^b	0	0.0%	283	34.9%	26	24.7%	310	12.6%
Property and business services	99	7.4%	42	5.2%	6	5.5%	147	6.0%
Public administration and defence	103	7.8%	18	2.2%	3	2.4%	124	5.0%
Education	96	7.2%	6	0.7%	2	1.9%	104	4.2%
Health and community services	153	11.5%	10	1.2%	4	3.8%	167	6.8%
Cultural and recreational services	12	0.9%	3	0.4%	1	0.6%	16	0.6%
Personal services	43	3.2%	3	0.4%	2	1.4%	47	1.9%
Total Intermediate	1,333	100.0%	812	100.0%	106	100.0%	-	-
Net Taxes in Final Demand	-	-	-	-	-	-	213	8.6%
Gross Regional Product	-	-	-	-	-	-	2,464	100.0%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a), EconSearch (2009a,b) and EconSearch analysis.

Appendix Table 1-7 Value of imports and exports by industry, Fleurieu & Coorong region, 2009/10 ^a

SECTOR	Tourism		Other Exports		Total Exports		Imports	
	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	0	0.0%	225	21.2%	225	17.1%	50	2.2%
Mining	0	0.0%	29	2.8%	29	2.2%	7	0.3%
Manufacturing	21	8.1%	462	43.5%	483	36.6%	411	17.9%
Electricity, gas and water	0	0.0%	0	0.0%	0	0.0%	12	0.5%
Building and construction	0	0.0%	116	10.9%	116	8.8%	201	8.7%
Wholesale trade	8	3.2%	0	0.0%	8	0.6%	69	3.0%
Retail trade	48	18.4%	0	0.0%	48	3.6%	80	3.5%
Accommodation, cafes & restaurants	58	22.5%	1	0.0%	59	4.5%	68	3.0%
Transport and storage	7	2.6%	66	6.3%	73	5.6%	66	2.9%
Communication services	0	0.0%	19	1.8%	19	1.4%	24	1.1%
Finance and insurance	0	0.0%	35	3.3%	35	2.7%	31	1.4%
Ownership of dwellings ^b	11	4.3%	0	0.0%	11	0.8%	32	1.4%
Property and business services	2	0.8%	48	4.5%	50	3.8%	92	4.0%
Public administration and defence	0	0.0%	19	1.8%	19	1.5%	45	2.0%
Education	1	0.3%	0	0.0%	1	0.1%	16	0.7%
Health and community services	0	0.0%	0	0.0%	0	0.0%	21	0.9%
Cultural and recreational services	7	2.6%	0	0.0%	7	0.5%	15	0.6%
Personal services	0	0.0%	0	0.0%	0	0.0%	15	0.6%
Total Intermediate	163	62.8%	1,020	96.2%	1,184	89.6%	1,254	54.5%
PRIMARY INPUTS								
Household Income	0	0.0%	0	0.0%	0	0.0%	-	-
GOS and GMI ^c	0	0.0%	0	0.0%	0	0.0%	-	-
Taxes Less Subsidies	20	7.8%	-1	-0.1%	19	1.5%	-	-
Imports	76	29.4%	41	3.9%	117	8.9%	-	-
Primary Inputs Total	97	37.2%	40	3.8%	137	10.4%	-	-
FINAL DEMAND								
Household Expenditure	-	-	-	-	-	-	763	33.2%
Government Expenditure	-	-	-	-	-	-	44	1.9%
Gross Fixed Capital	-	-	-	-	-	-	121	5.2%
Change in Inventories	-	-	-	-	-	-	0	0.0%
Tourism	-	-	-	-	-	-	76	3.3%
Other Exports	-	-	-	-	-	-	41	1.8%
Final Demand Total	-	-	-	-	-	-	1,046	45.5%
GRAND TOTAL	260	100.0%	1,060	100.0%	1,320	100.0%	2,300	100%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a), EconSearch (2009a,b) and EconSearch analysis.

Kangaroo Island

Kangaroo Island is located south-west of Adelaide (Figure 1). The one statistical local area (SLA) that comprises the region is Kangaroo Island (DC). The Kangaroo Island regional economy is relevant to the Western Kangaroo Island (MP16), and Southern Kangaroo Island (MP17) marine parks. Table 1 presents a summary of the key economic and social information detailed further in the report.

Appendix Figure 1–2 Kangaroo Island region



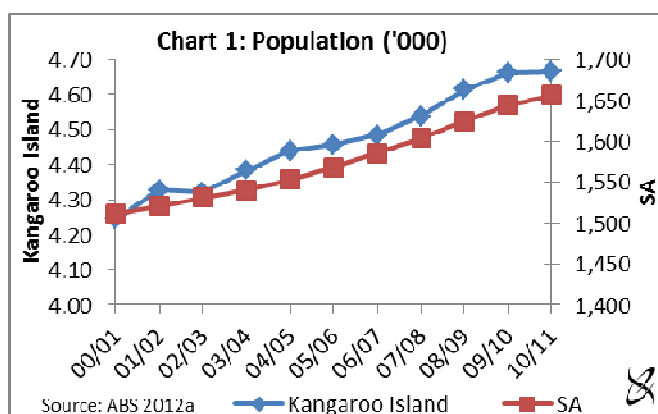
Source: ABS TableBuilder

Appendix Table 1-8 Summary of key economic and social indicators for Kangaroo Island

Indicator	Kangaroo Island	SA	Kangaroo Island as a proportion of SA
Population, 2010/11 (no.)	4,666	1,656,299	0.3%
Birth Rate, 2009/10 (births/1000 residents)	11.8	12.2	-
Death Rate, 2009/10 (deaths/1000 residents)	6.9	7.9	-
Age Distribution, 2009/10:			
Proportion of Population aged 0-14	19%	18%	-
Proportion of Population aged 15-64	65%	67%	-
Proportion of Population aged 65+	16%	16%	-
Dependency Rate, 2009/10:			
Child	29%	27%	-
Aged	24%	23%	-
Total	54%	50%	-
Population Projection, Increase from 2006 to 2026	20%	23%	-
Employment, June qtr 2011:			
Labour Force (no.)	2,678	867,500	0.3%
Unemployed (no.)	105	45,300	0.2%
Unemployment Rate	4%	5%	-
Participation Rate, 2009/10	69%	63%	-
Businesses, June 2009 (no.)	687	141,625	0.5%
School Enrollments, 2011	620	247,356	0.3%
Tertiary Enrollments, 2011	411	208,706	0.2%
Non-school Qualifications, 2006	838	595,379	0.1%
Mean Taxable Income, 2009/10 (\$)	43,766	54,349	-
Proportion of Taxable Individuals, 2009/10	64%	74%	-
Value per Building Approval, 2010/11 (\$)	255,153	236,269	-
Median Dwelling Price, 2010/11 (\$)	235,000	357,500	-
Commercial Fishing, Ave/yr 2000/01 to 2009/10:			
Catch (t)	1,407	47,581	3.0%
Value of Catch (\$m)	10	202	5.0%
Charter Boats, Ave/yr 2007/08 to 2009/10 (no. of fish)	20,333	146,341	13.9%
Recreational Fishing, 2007/08:			
Fishers (no.)	11,190	236,463	4.7%
Days Fished (no.)	32,743	1,054,200	3.1%
Gross Regional Product, 2009/10 (\$m)	161	80,356	0.2%
Employment, 2009/10 (fte)	2,262	774,953	0.3%
Tourism, 2009/10 (\$m)	121	4,524	2.7%
Other Regional Exports, 2009/10 (\$m)	93	26,757	0.3%
Regional Imports, 2009/10 (\$m)	235	40,573	0.6%

Demographic indicators

- The estimated resident population of Kangaroo Island increased by 10 per cent (approximately 400 persons) between 2000/01 and 2010/11 and was almost 4,700 persons in 2010/11. Over the same period SA experienced similar population growth of almost 10 per cent (Chart 1).
- Compared with the age distribution of the state as a whole, Kangaroo Island has a slightly higher than average concentration of younger people (aged 0 to 14 years), a smaller than average share of persons aged 15 to 64 years and a similar share of people aged 65 and over (Table 2).



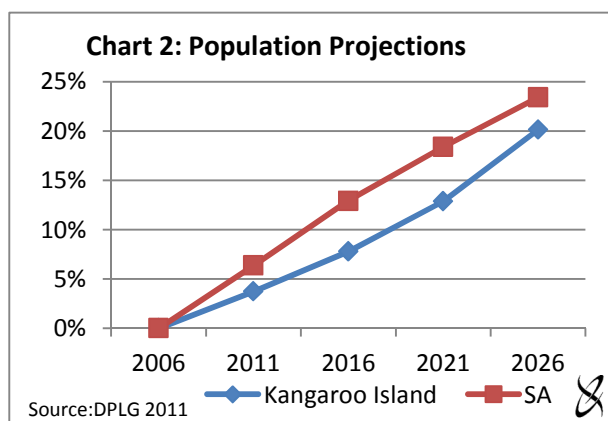
Appendix Table 1-9 Age distribution of the population for Kangaroo Island and SA, 2000/01 to 2009/10

Age	Year									
	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Kangaroo Island										
0 to 14	22%	21%	21%	21%	20%	19%	19%	19%	19%	19%
15 to 64	65%	66%	66%	66%	66%	67%	66%	66%	65%	65%
65 or older	13%	13%	13%	13%	14%	14%	15%	15%	16%	16%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
South Australia										
0 to 14	19%	19%	19%	19%	18%	18%	18%	18%	18%	18%
15 to 64	66%	66%	66%	66%	66%	67%	67%	67%	67%	67%
65 or older	15%	15%	15%	15%	15%	15%	15%	15%	15%	16%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: ABS 2010a and ABS 2011c

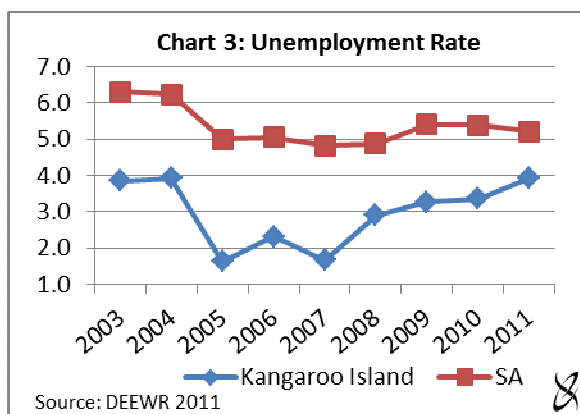
- The total dependency rate for Kangaroo Island was 54 per cent in 2009/10. This implies that for any dependent person (persons aged 0 to 14 and over 65) there approximately 2 persons providing support. At the state level the dependency rate was 50 per cent in 2009/10 (ABS 2010a and ABS 2011c).

- According to the Department of Planning and Local Government (DPLG) population projections¹⁶, the total population on Kangaroo Island is likely to increase by around 20 per cent by 2026 and the SA population is expected to increase by a similar amount, approximately 23 per cent (Chart 2).
- Population projections for Kangaroo Island for persons aged 0 to 14 years indicate that there will be an increase (12 per cent from 2006) in this age category. There is projected to be no change in the working age population (15 to 64 years) (from 2006). The population projections for persons 65 or older indicate that a significant increase of around 127 per cent in this age group is expected over the 20 years to 2026 (DPLG 2011).



Labour force indicators

- In the June quarter of 2011, the labour force on Kangaroo Island was almost 2,700 (by place of residence), an increase of 20 per cent from the March quarter of 2003. By comparison, the labour force for SA increased by 14 per cent over the same period (DEEWR 2011).
- The number of unemployed persons on Kangaroo Island was 97 in March 2003 and 105 in June 2011, an increase of approximately 8 per cent over the period. By comparison, the number of unemployed persons in SA decreased by approximately 11 per cent over the same period (DEEWR 2011).
- The unemployment rate on Kangaroo Island was almost 3.9 per cent in the June quarter of 2011. The unemployment rate for SA for the same quarter was higher at 5.2 per cent (Chart 3).
- The labour force participation rate was consistently higher for Kangaroo Island than for the whole of SA, over the years 2002/03 to 2009/10, reflecting the lower proportion of elderly people living on Kangaroo Island. In 2009/10 the labour force participation rate on Kangaroo Island was around 69 per cent compared to 63 per cent for SA as a whole (DEEWR 2011, ABS 2010a and ABS 2011c).



¹⁶ Population projections are not forecasts, they are based on ABS 2006 *Census of Population and Housing* resident population estimates and trends in mortality, fertility and overseas and interstate migration for South Australia. A range of estimates are published, based on the assumed level of migration. The 'medium level of migration' series has been utilised in this analysis. The method used to compile the projections was not influenced by local factors such as land availability or zoning, that is, it was assumed that these factors would not be limiting on population growth.

Business Count

- The total number of businesses operating at the end of June 2009 on Kangaroo Island was 687, 0.5 per cent of the total businesses operating in SA (almost 142,000) (ABS 2011d).
- Of the 687 businesses operating on Kangaroo Island, over 50 per cent were classified in the agriculture, forestry and fishing sector and 10 per cent were in the construction sector (ABS 2011d).
- Approximately 60 of the businesses operating on Kangaroo Island did not employ anyone and 20 per cent employed between 1 and 4 people (ABS 2011d).

Education and training

- The total number of residents on Kangaroo Island with a non-school qualification increased slightly over the 5 years to 2006. In 2006, approximately 24 per cent of all persons aged 15 or over held some form of non-school qualification, compared with 21 per cent in 2001 (ABS 2007 and 2010a).
- The level of qualification was generally lower for Kangaroo Island than for SA, with the proportion of persons with a bachelor degree or higher being significantly lower (Table 3).

Appendix Table 1-10 Highest level of qualifications for persons aged 15 and over on Kangaroo Island and SA, 2001 and 2006 ^a

Qualification	Kangaroo Island			
	2001		2006	
Postgraduate Degree	17	3%	17	2%
Graduate Diploma & Graduate Certificate	12	2%	9	1%
Bachelor Degree	73	11%	107	13%
Advanced Diploma & Diploma	67	10%	64	8%
Certificate	351	54%	425	51%
Level of education not described or stated	136	21%	216	26%
Total	656	100%	838	100%
	South Australia			
	2001		2006	
Postgraduate Degree	15,203	3%	22,897	4%
Graduate Diploma & Graduate Certificate	14,361	3%	16,098	3%
Bachelor Degree	95,812	20%	120,979	20%
Advanced Diploma & Diploma	63,469	13%	79,698	13%
Certificate	185,129	38%	212,581	36%
Level of education not described or stated	115,200	24%	143,126	24%
Total	489,174	100%	595,379	100%

^a 2011 Census data on qualifications not available until the second release in October 2012.

Source: 2006 Census of Population and Housing (ABS 2007).

- The total number of Kangaroo Island students enrolled in primary school decreased by 12 per cent between 2001 and 2011. The decline was comprised of a 15 per cent decrease in government school enrolments and a small increase in non-government school enrolments (Table 4).
- The total number of Kangaroo Island students enrolled in secondary school declined by 31 per cent between 2001 and 2011. The decline was comprised of a decrease in government school enrolments and (Table 4).
- Between 2001 and 2011 the total number of Kangaroo Island residents enrolled in a higher education institute increased by 45 per cent. This is a greater increase than for SA as a whole (38 per cent increase) (ABS 2012b).

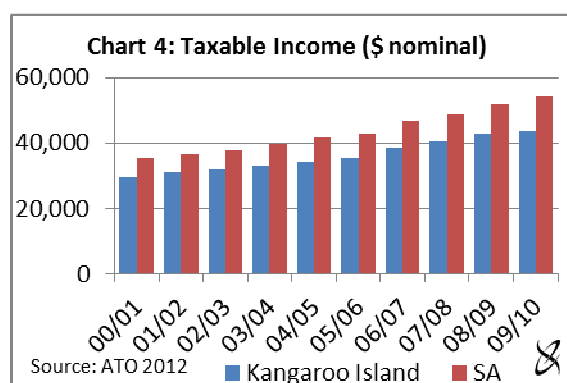
Appendix Table 1-11 School enrolments in the Kangaroo Island region and SA, 2001, 2006 and 2011

	Census Year		
	2001	2006	2011
Kangaroo Island			
Pre-school	73	52	43
Primary			
- Government	431	430	366
- Non-Government	3	11	16
Total Primary Student	434	441	382
Secondary Students			
- Government	284	213	195
- Non-Government	0	4	0
Total Secondary Students	284	217	195
South Australia			
Pre-school	18,246	18,533	20,537
Primary			
- Government	103,975	93,220	87,542
- Non-Government	43,150	45,796	48,634
Total Primary Student	147,125	139,016	136,176
Secondary Students			
- Government	57,770	51,752	51,901
- Non-Government	31,725	35,172	38,742
Total Secondary Students	89,495	86,924	90,643

Source: 2011 Census of Population and Housing (ABS 2012b)

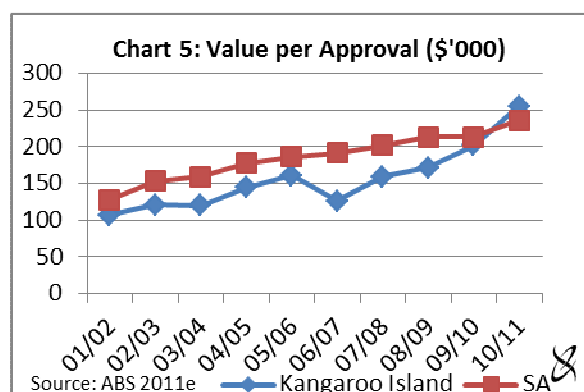
Household income

- The mean individual taxable income on Kangaroo Island was consistently lower than the state average between 2000/01 and 2009/10 (Chart 4).
- Over the period 2000/01 to 2009/10, the mean taxable income (in nominal terms) increased by 48 per cent on Kangaroo Island and 54 per cent in SA as a whole (Chart 4).
- In 2009/10 mean taxable income was almost \$43,800 on Kangaroo Island and around \$54,350 in SA (Chart 4).



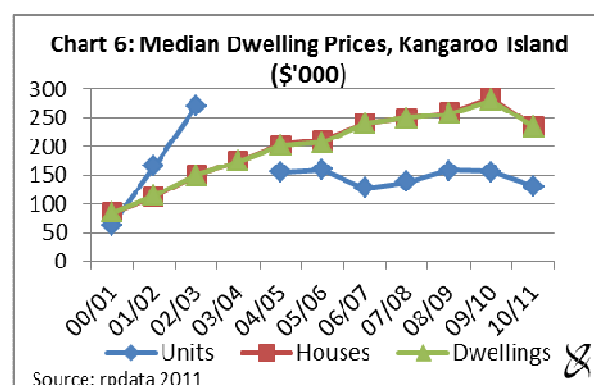
Building approvals

- The number of building approvals on Kangaroo Island decreased by 55 per cent between 2001/02 to 2010/11. However, the total value of approvals increased over the same period from \$10.7m in 2001/02 to \$11.5m in 2010/11, an increase of 7 per cent (ABS 2011e).
- For SA the total number of approvals was also 3 per cent greater in 2010/11 than in 2001/02, while the total value was 90 per cent higher (ABS 2011e).
- Despite fluctuations in between years, the average value per approval on Kangaroo Island increased by approximately 137 per cent, from \$107,000 in 2001/02 to \$255,000 in 2010/11 (Chart 5).
- For SA, the value per approval increased from \$128,000 in 2001/02 to \$236,000 in 2010/11, an increase of 85 per cent (Chart 5).



Property Values

- Between 2000/01 and 2010/11 the median unit price on Kangaroo Island more than doubled, from \$62,000 in 2000/01 to \$131,000 in 2010/11 (Chart 6). The median unit price in SA as a whole increased by 215 per cent over the 10 year period, from almost \$102,000 to \$320,000 (rpdata 2011).
- The median house price on Kangaroo Island increased by 176 per cent between 2000/01 and 2010/11, from almost \$85,000 to \$235,000 (Chart 6). In comparison, house prices in SA as a whole increased at a lower rate, from \$126,000 to \$370,000 over the same period, a 194 per cent increase (rpdata 2011).



- Overall median dwelling (units and houses) prices increased by 176 per cent on Kangaroo Island (\$235,000 in 2010/11) and 197 per cent in SA as a whole (\$357,500 in 2010/11) over the period 2000/01 to 2010/11 (rpdata 2011).

Commercial fishing

- The average annual catch of abalone in the Kangaroo Island region over the past 10 years, 2000/01 to 2009/10, was almost 47 tonnes. The value of this average annual catch was around \$1.9 million (SARDI by special request).
- In the Kangaroo Island region over the past 10 years, 2000/01 to 2009/10, the average annual catch of sardines was approximately 1,000 tonnes with a beach value of almost \$700,000 (SARDI).
- Annual catch of rock lobster in the Kangaroo Island region averaged around 115 tonnes with a beach value of approximately \$3.9 million over the period 2000/01 to 2009/10 (SARDI).
- Annual average catch of Marine Scalefish species including miscellaneous species in the Kangaroo Island region over the period 2000/01 to 2009/10 was approximately 156 tonnes with a beach value of around \$845,000 (SARDI).
- Between 2007/08 and 2009/10 the charter boat operators in the Kangaroo Island region caught on average approximately 20,000 fish per annum (SARDI). This compares to an annual average catch for SA of 146,000 fish over the same period (PIRSA 2010).

Recreational Fishing

- Between 2000/01 and 2007/08 the total number of SA resident recreational fishers (those aged 5 and older) on Kangaroo Island (regions 20 and 21 in the report South Australian Recreational Fishing Survey 2007/08 (Jones 2009)) increased by 2 per cent, from around 7,700 in 2000/01 to almost 8,400 fishers in 2007/08.
- At the state level the number of SA resident recreational fishers decreased from an estimated 317,200 in 2000/01 to around 236,500 fishers in 2007/08 (a 25 per cent decrease) (Jones 2009).
- Despite the number of SA resident recreational fishers on Kangaroo Island increasing between 2000/01 and 2007/08, the number of days fished by SA resident recreational fishers fell. On Kangaroo Island the number of days fished by SA resident recreational fishers decreased from approximately 38,000 days in 2000/01 to around 33,000 days in 2007/08 (a 15 per cent decline) (Jones 2009).
- For SA as a whole, the total number of days fished by SA resident recreational fishers almost halved over the seven years, from 1.83 million days in 2000/01 to 1.05 million in 2007/08 (Jones 2009).

Economic Contribution of Tourism to the Region

In aggregate, it was estimated that expenditure by tourists in the Kangaroo Island region in 2009/10 (\$121m (TRA 2011 and EconSearch analysis)) generated the following level of regional economic and demographic activity.

- Approximately \$62 million in GRP which represents 38 per cent of the regional total (\$161 million).
- Approximately 1,100 full-time and part-time jobs which represents 46 per cent of the regional total (2,400 total jobs).
- Almost 1,000 fte jobs which represents 43 per cent of the regional total (2,300 fte).

Regional Economic Structure

- At the time of the 2006 population census it was estimated that approximately 90 per cent of the jobs in the region were held by local residents and the balance were held predominantly by residents of adjacent regions (i.e. travelled to work from the surrounding SLAs). Approximately 97 per cent of employed residents were employed locally, with the balance travelling to other areas in SA for work including a significant proportion in the surrounding areas¹⁷).
- It was estimated that there were approximately 2,400 jobs (2,300 fte jobs) on Kangaroo Island in 2009/10 (by place of remuneration) (Table 5).
- In 2009/10, the top four contributors to total jobs in the region were the agriculture forestry and fishing (22 per cent), retail trade and accommodation, restaurants and cafes (both 14 per cent) and health and community services (8 per cent) sectors (Table 5).
- The Kangaroo Island gross regional product (GRP) was estimated to be \$161 million in 2009/10 (Table 6). This compares with gross state product (GSP) in the same year of \$80.36 billion (ABS 2010b).
- The GRP of the Kangaroo Island region comprised approximately 0.2 per cent of the SA GSP.
- In 2009/10, the top contributors to GRP were the agriculture, forestry and fishing (20 per cent), transport and storage (10 per cent), ownership of dwellings (9 per cent), and accommodation, cafes and restaurants (8 per cent) sectors (Table 6).
- Expenditure by tourists accounted for one third and expenditure by households accounted for 22 per cent of the total value of goods and services imported into the region in 2009/10. Among of the intermediate sectors, the top importers in the region in 2009/10 were the building and construction (7 per cent), agriculture, forestry and fishing, transport and storage and accommodation, cafes and restaurants (5 per cent each) sectors (Table 7).
- Expenditure by tourists (\$121m) contributed approximately 57 per cent of the total value of exports from the region in 2009/10 (Table 7).
- The top contributors to the value of 'other exports' from the region in 2009/10 were the agriculture, forestry and fishing (48 per cent), accommodation, cafes and restaurants (20 per cent) and transport and storage (15 per cent) sectors (Table 7).

¹⁷ Based on detailed 'journey to work' employment data obtained from the ABS 2006 Census of Population and Housing using the TableBuilder database.

Appendix Table 1-12 Employment, household income and household expenditure, Kangaroo Island region, 2009/10 ^a

SECTOR	Total Employment		FTE Employment		Household Income		Household Expenditure	
	(jobs)	(%)	(fte)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	535	22.0%	592	26.2%	20	22.3%	0	0.5%
Mining	0	0.0%	0	0.0%	0	0.2%	0	0.5%
Manufacturing	76	3.1%	79	3.5%	3	2.8%	2	2.0%
Electricity, gas and water	5	0.2%	5	0.2%	1	0.6%	1	0.5%
Building and construction	119	4.9%	106	4.7%	0	0.4%	1	0.8%
Wholesale trade	88	3.6%	96	4.3%	0	0.0%	0	0.0%
Retail trade	332	13.7%	285	12.6%	0	0.0%	0	0.0%
Accommodation, cafes & restaurants	331	13.6%	261	11.6%	3	3.6%	0	0.0%
Transport and storage	176	7.2%	177	7.8%	23	25.5%	16	15.6%
Communication services	15	0.6%	16	0.7%	3	3.5%	2	1.7%
Finance and insurance	23	0.9%	22	1.0%	1	1.3%	0	0.2%
Ownership of dwellings ^b	0	0.0%	0	0.0%	2	2.6%	0	0.3%
Property and business services	112	4.6%	94	4.2%	9	10.2%	13	12.4%
Public administration and defence	157	6.5%	146	6.4%	9	9.7%	1	1.0%
Education	192	7.9%	176	7.8%	7	8.0%	1	1.2%
Health and community services	202	8.3%	149	6.6%	7	7.5%	3	2.6%
Cultural and recreational services	24	1.0%	21	0.9%	1	0.6%	0	0.3%
Personal services	43	1.8%	36	1.6%	1	1.3%	1	1.1%
Total Intermediate	2,429	100.0%	2,262	100.0%	91	100.0%	42	40.7%
PRIMARY INPUTS								
Household Income	-	-	-	-	-	-	0	0.0%
GOS and GMI ^c	-	-	-	-	-	-	0	0.0%
Taxes Less Subsidies	-	-	-	-	-	-	9	8.7%
Imports	-	-	-	-	-	-	52	50.6%
Primary Inputs Total	-	-	-	-	-	-	61	59.3%
GRAND TOTAL	2,429	100.0%	2,262	100.0%	91	100.0%	104	100.0%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a) EconSearch (2009a,b) and EconSearch analysis.

Appendix Table 1-13 Components of gross regional product in the Kangaroo Island region by industry, 2009/10 ^a

SECTOR	Household Income		GOS and GMI ^c		Taxes less Subsidies		Gross Regional Product	
	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	20	22.3%	10	19.6%	1	18.2%	32	19.8%
Mining	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Manufacturing	3	3.7%	2	4.5%	0	3.7%	6	3.7%
Electricity, gas and water	0	0.4%	0	0.6%	0	0.5%	1	0.4%
Building and construction	6	6.5%	2	4.7%	0	5.4%	9	5.4%
Wholesale trade	5	5.1%	1	2.7%	0	5.7%	6	4.0%
Retail trade	7	7.1%	2	4.1%	0	5.4%	9	5.6%
Accommodation, cafes & restaurants	9	10.4%	2	4.6%	1	16.7%	13	8.2%
Transport and storage	7	7.4%	8	16.2%	1	10.4%	16	9.9%
Communication services	1	1.5%	2	3.3%	0	1.6%	3	2.0%
Finance and insurance	2	2.5%	2	4.3%	0	3.6%	5	3.0%
Ownership of dwellings ^b	0	0.0%	13	25.6%	1	15.7%	14	9.0%
Property and business services	6	6.1%	3	5.0%	0	5.0%	9	5.3%
Public administration and defence	9	9.7%	2	2.9%	0	2.8%	11	6.6%
Education	7	8.0%	0	0.9%	0	2.0%	8	4.9%
Health and community services	7	7.5%	0	0.9%	0	2.5%	8	4.7%
Cultural and recreational services	1	0.6%	0	0.1%	0	0.3%	1	0.4%
Personal services	1	1.3%	0	0.1%	0	0.4%	1	0.8%
Total Intermediate	91	100.0%	52	100.0%	8	100.0%	-	-
Net Taxes in Final Demand	-	-	-	-	-	-	10	6.4%
Gross Regional Product	-	-	-	-	-	-	161	100.0%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a) EconSearch (2009a,b) and EconSearch analysis.

Appendix Table 1-14 Value of imports and exports by industry, Kangaroo Island region, 2009/10 ^a

SECTOR	Tourism		Other Exports		Total Exports		Imports	
	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)	(\$m)	(%)
Agriculture, forestry and fishing	0	0.0%	45	48.1%	45	20.9%	12	5.1%
Mining	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Manufacturing	3	2.3%	4	4.6%	7	3.3%	7	2.9%
Electricity, gas and water	0	0.0%	0	0.0%	0	0.0%	1	0.3%
Building and construction	0	0.0%	0	0.5%	0	0.2%	17	7.1%
Wholesale trade	2	1.3%	0	0.0%	2	0.7%	5	2.1%
Retail trade	8	6.4%	0	0.0%	8	3.6%	5	2.2%
Accommodation, cafes & restaurants	5	4.4%	19	20.1%	24	11.2%	12	5.0%
Transport and storage	9	7.3%	14	15.3%	23	10.8%	13	5.5%
Communication services	0	0.0%	1	1.3%	1	0.5%	2	1.0%
Finance and insurance	0	0.0%	3	2.8%	3	1.2%	2	0.7%
Ownership of dwellings ^b	7	6.1%	0	0.0%	7	3.5%	2	0.8%
Property and business services	4	3.1%	0	0.0%	4	1.8%	6	2.6%
Public administration and defence	0	0.0%	3	3.5%	3	1.5%	4	1.7%
Education	0	0.0%	2	2.5%	2	1.1%	1	0.5%
Health and community services	0	0.0%	1	0.6%	1	0.3%	1	0.6%
Cultural and recreational services	0	0.3%	0	0.1%	0	0.2%	1	0.3%
Personal services	0	0.0%	0	0.1%	0	0.0%	0	0.2%
Total Intermediate	38	31.3%	92	99.3%	130	60.8%	91	38.5%
PRIMARY INPUTS								
Household Income	0	0.0%	0	0.0%	0	0.0%	-	-
GOS and GMI ^c	0	0.0%	0	0.0%	0	0.0%	-	-
Taxes Less Subsidies	5	4.0%	-3	-3.3%	2	0.8%	-	-
Imports	78	64.7%	4	4.0%	82	38.3%	-	-
Primary Inputs Total	83	68.7%	1	0.7%	84	39.2%	-	-
FINAL DEMAND								
Household Expenditure	-	-	-	-	-	-	52	22.3%
Government Expenditure	-	-	-	-	-	-	2	0.7%
Gross Fixed Capital	-	-	-	-	-	-	9	3.7%
Change in Inventories	-	-	-	-	-	-	0	0.0%
Tourism	-	-	-	-	-	-	78	33.2%
Other Exports	-	-	-	-	-	-	4	1.6%
Final Demand Total	-	-	-	-	-	-	145	61.5%
GRAND TOTAL	121	100.0%	93	100.0%	213	100.0%	235	100%

^a The economic profile of the regional economy is also available in terms of a 60-sector industry classification if required.

^b The ownership of dwellings sector is a notional sector designed to impute a return to the state's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

^c Gross operating surplus and gross mixed income.

Source: ABS (2006), ABS (2008), ABS (2009), ABS (2010b,c), ABS (2011f), ABS (2012a) EconSearch (2009a,b) and EconSearch analysis.

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Appendix 2 Activities and Uses Tables

The following tables summarise how activities and uses are expected to be managed once marine park management plans are adopted. The prohibitions and restrictions described in the tables (grey shaded boxes) will be represented in the *Marine Park (Zoning) Variation Regulations 2012*.

Section 4 of the *Marine Parks Act 2007* establishes four types of marine park zones. These are General Managed Use, Habitat Protection, Sanctuary and Restricted Access Zones.

Section 5 of the *Marine Parks Act 2007* provides for Special Purpose Areas. These are areas within a marine park, defined by management plans, in which specified activities will be allowed that would otherwise be prohibited or restricted by zoning.

No additional permits under the *Marine Parks Act 2007* will be required if the activity is already permitted or licensed under another Act.

Exemptions

- The Minister responsible for marine parks may provide a permit for any activity to take place that would not ordinarily be allowed in a specific zone in accordance with section 19 of the *Marine Parks Act 2007*.
- The Regulations also provide an exemption for any person acting in the course of an emergency.
- The Regulations will not apply to a person exercising official powers or functions under a State or Commonwealth Act or an Aboriginal person acting in accordance with an ILUA or Aboriginal tradition..

Existing activities and uses

When management plans are developed, existing and reasonably foreseeable activities and uses will be accommodated, (as outlined by the policy commitments endorsed by Government) by appropriate zoning, the application of Special Purpose Areas or the provision of permits. Apart from fishing activities, any permits, licences or leases that are current at the time of the adoption of management plans, will not be affected by these restrictions.

KEY

GMUZ	General Managed Use Zone - being a zone primarily established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing ecologically sustainable development and use
HPZ	Habitat Protection Zone - being a zone primarily established so that an area may be managed to provide protection for habitats and biodiversity within a marine park, while allowing activities and uses that do not harm habitats or the functioning of ecosystems
SZ	Sanctuary Zone - being a zone primarily established so that an area may be managed to provide protection and conservation for habitats and biodiversity within a marine park, especially by prohibiting the removal or harm of plants, animals or marine products
RAZ	Restricted Access Zone - being a zone primarily established so that an area may be managed by limiting access to the area

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

RECREATION, EDUCATION AND OTHER

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Operating aircraft				limit	Limit: Aircraft cannot fly within 300m of the ground or sea level, and helicopters not within 500m of the ground or sea level.
Diving e.g. scuba/snorkel					
Pedestrian access					
Recreational boating/yachting					
Surfing/swimming					
Domestic animals			limit		Limit: Dogs on leads (up to 2m long); or animals confined to vessels/vehicles; or animals under effective control and behaving in accordance with relevant local Council by-laws.
Research			permit	permit	Permit ³ : A permit is not required for research authorised under another Act.
Commercial photography / film making			permit		Permit ³ : A permit is not required for commercial photography/film making authorised under another Act.
Competitions / organised events (non-fishing)			permit		Permit ³ : A permit is not required for non-fishing competitions/organised events authorised under another Act.
Tourism operations			permit		Permit ³ : A permit is not required for tourism operations authorised under another Act.

RECREATION, EDUCATION AND OTHER				
	GMUZ	HPZ	SZ	RAZ
Animal feeding/baiting/berleying ¹				
Motorised water sports ²				
Lighting and supervision of fires		limit	limit	
Camping		limit	limit	
Collection of naturally occurring materials for burning in fires				

Notes:

¹ Feeding/baiting/berleying animals is not recommended in marine parks, except as required for fishing, aquaculture, research or tourism purposes.

² A person may transit through a sanctuary zone in a motorised vessel, but gear such as water skis or a wake board must be stowed.

³ Standard permits (and conditions) may be issued for activities that are deemed to be low impact. All other activities will be subject to case-by-case assessments and non-standard permits (and conditions) may be issued. DEWNR will develop a permit policy to provide clear guidance to users about activities that require permits.

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

FISHING AND COLLECTING (commercial, recreational and traditional)

Fishing activities are regulated under provisions of the *Fisheries Management Act 2007*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Bait digging/pumping					
Berleying for fishing					
Cockling (pipi and mud cockles)					
Collecting fish by hand (abalone, urchin, scallop, etc)					
Line fishing (including long lining)					
Netting (e.g. dab, haul, swing, gill, beach or power)					
Pot and trap fishing (including drop/hoop nets)					
Purse seine netting (including sardine)					
Raking (crab)					
Spear fishing					
Competitions / organised events (fishing)					

FISHING AND COLLECTING (commercial, recreational and traditional)

Fishing activities are regulated under provisions of the *Fisheries Management Act 2007*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Traditional fishing and collecting (Aboriginal)					Limit: Activity is limited to persons who are exercising their rights in accordance with an ILUA or Aboriginal tradition.
Collecting seagrass/algae (including beach cast)					
Collecting sessile assemblages, stromatolites, fossils and archaeological remains					
Trawling					

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

HARBOR, NAVIGATION & TRANSPORT ACTIVITIES ¹

Harbor, navigation and transport activities are regulated under provisions of the *Harbors and Navigation Act 1993*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Navigation markers/aids					
General navigation and operation of vessels (other than anchoring)					
Anchoring of vessels – less than 80 metres (overall length)					
Anchoring of vessels – 80 metres and over (overall length)					Special Purpose Areas will provide for anchoring of vessels 80 metres and over in all harbors and in designated transshipment and anchoring locations and pilot boarding grounds
Permanent vessel moorings			permit		Permit: A permit will be required, which includes assessment by DEWNR and DPTI.
Dredging		limit			Limit: Activity is confined to harbors established under the <i>Harbors and Navigation Act 1993</i> .
Depositing dredged materials		limit			

Notes:

¹ Activities undertaken to support the ongoing operation of ports and harbors will be provided for in all zones. Also, given the extensive development expected to occur over the next 5-10 years in Upper Spencer Gulf, transitional arrangements will be required. For this purpose all HPZ, SZ and RAZ in Upper Spencer Gulf Marine Park will be declared Special Purpose Areas. This will provide for (a) developments comprising a development or project, or that part of a development or project, within the ambit of a declaration under section 46 of the *Development Act 1993*; and (b) activities comprising development approved under section 49 (crown development and public infrastructure) or section 49A (Electricity infrastructure development) of the *Development Act 1993*. This arrangement will be assessed at the time the first management plan is reviewed.

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

COASTAL DEVELOPMENTS AND INFRASTRUCTURE ¹

Coastal developments and infrastructure are regulated under provisions of the *Development Act 1993*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Infrastructure (marinas, jetties, pontoons, breakwalls)					
Outfall and pipelines					
Renewable energy infrastructure (wind, wave, tidal)					

Notes:

¹ Coastal developments and infrastructure in HPZ will be managed under the *Development Act 1993* to achieve the definition of the zone (i.e. no harm to habitats or the functioning of ecosystems). Developments will be considered on a case by case basis to ensure that the achievement of the objects of the Act and the zone are supported appropriately. Development Plans and significant projects are informed by the Planning Strategy which now includes the objects of the *Marine Parks Act 2007* so consideration of these will inform the assessment process. In addition, as part of the assessment process, advice or direction may be required from the Coast Protection Board and/or the Environment Protection Authority and other authorities, depending on the nature of the development. These agencies also have the requirement to take into account the objects of the *Marine Parks Act 2007*.

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

AQUACULTURE

Aquaculture activities are regulated under provisions of the *Aquaculture Act 2001*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Farming of bivalve molluscs					
Farming of aquatic animals (other than prescribed wild-caught tuna) with regular feeding					
Farming of prescribed wild-caught tuna					
Farming of algae					
Pilot leases					

Notes: Aquaculture in HPZ will be managed under the *Aquaculture Act 2001* to ensure that all reasonable and practicable measures are taken to achieve the definition of the zone (i.e. no harm to habitats or the functioning of ecosystems). The *Aquaculture Act 2001* operates in addition to the *Marine Parks Act 2007* and requires aquaculture policies to seek to further the objects of the *Marine Parks Act 2007* where they apply within a marine park.

KEY

	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with stated limits under the Regulations.
permit	Activity is deemed to be consistent with the definition of the zone when conducted in accordance with a permit under the Regulations.
	Activity is deemed to be inconsistent with the definition of the zone and will not be allowed. However, the Minister for Sustainability, Environment and Conservation may grant a permit for an activity that would otherwise be prohibited or restricted in a zone on a case by case basis.

WASTEWATER DISPOSAL/ DISCHARGES

Discharges are generally regulated under provisions of the *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2003*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Discharge ¹					Discharges regulated under sections 3(2) or 8(7) of Schedule 1 of the <i>Environment Protection Act 1993</i> are prohibited
Extraction and disposal for a desalination plant ¹					
Vessel discharge of wastewater ²					Specifically regulated by Clause 36 of the <i>Environment Protection (Water Quality) Policy 2003</i>

Notes:

¹ Discharges in HPZ will be managed under the *Environment Protection (Water Quality) Policy 2003* to ensure that all reasonable and practicable measures are taken to achieve the definition of the zone (i.e. no harm to habitats or the functioning of ecosystems).

² Wastewater includes black water, concentrated black water and grey water as defined by the *Environment Protection (Water Quality) Policy 2003*.

KEY	
	Activity is deemed to be consistent with the definition of the zone (i.e. no change to current activity/use).
limit	Activity is consistent with the definition of the zone when conducted in accordance with stated limits.
*	Activity is deemed to be inconsistent with the definition of the zone and will not be considered until such time as it can be demonstrated otherwise.
	Activity is deemed to be inconsistent with the definition of the zone and will not be permitted.

RESOURCE EXPLORATION AND PRODUCTION

These activities are regulated under provisions of the *Mining Act 1971*, the *Petroleum and Geothermal Act 2000*, the *Offshore Minerals Act 2000* and the *Petroleum (Submerged Lands) Act 1982* to achieve the objectives of the marine park zones described under the *Marine Parks Act 2007*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Exploration (passive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– satellite/high level airborne					
– airborne surveys				*	*Will depend on the nature and timing of the proposed survey in relation to key environmental considerations (e.g. breeding and migration cycles of protected species).
– geophysical/geochemical surveys			limit		Limit: Will depend on the nature and timing of the proposed survey in relation to key environmental considerations (e.g. breeding and migration cycles of protected species).
Exploration (active)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– geological sampling			*		* Will depend on nature of proposed surveying
– geophysical/geochemical surveys			*		* Will depend on nature of proposed surveying
– drilling (drill rig within zone)		*			* Will depend on nature of proposal and its location
– deviated drilling (drill rig outside zone)			limit	*	Limit: Activity will need to be conducted in accordance with approved conditions * Deviated drilling from outside zone may be considered if consistent with the zone
– trenching/bulk sampling	*	*			* Will depend on nature of proposal and its location

RESOURCE EXPLORATION AND PRODUCTION

These activities are regulated under provisions of the *Mining Act 1971*, the *Petroleum and Geothermal Act 2000*, the *Offshore Minerals Act 2000* and the *Petroleum (Submerged Lands) Act 1982* to achieve the objectives of the marine park zones described under the *Marine Parks Act 2007*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Gas storage					
– carbon sequestration (surface facilities within zone)		*	x	x	* Will depend on nature of proposal and its location
– carbon sequestration (surface facilities outside zone)			*	*	* Deviated drilling from outside zone may be considered if consistent with the zone
Production/ Extraction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– seawater (for extraction of resources such as salt)					
– through drillhole (surface facilities within zone)		*			* Will depend on nature of proposal and its location
– through drillhole (surface facilities outside zone)			limit	*	Limit: Activity will need to be conducted in accordance with approved conditions * Extraction from deviated drillhole from outside zone may be considered if consistent with the zone
– underground mining with surface facility	*				* Will depend on nature of proposal and its location
– underground mining with no surface facility		limit	*	*	Limit: Activity will need to be conducted in accordance with approved conditions. May be considered if activity does not compromise habitats or the functioning of ecosystems. * Will depend on nature of proposal and its location.
– pipeline on/above ground/seabed/trenched		*			* Will depend on nature of proposal and its location
– pipeline underground			*	*	* Will depend on nature of proposal and its location
– seabed dredging	*				* Will depend on nature of proposal and its location
– pit-type extraction	*				* Will depend on nature of proposal and its location

RESOURCE EXPLORATION AND PRODUCTION

These activities are regulated under provisions of the *Mining Act 1971*, the *Petroleum and Geothermal Act 2000*, the *Offshore Minerals Act 2000* and the *Petroleum (Submerged Lands) Act 1982* to achieve the objectives of the marine park zones described under the *Marine Parks Act 2007*.

	GMUZ	HPZ	SZ	RAZ	Limits / Permits / Exceptions
Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
– mineral facility (mobile e.g. vessel based)	*				* Will depend on nature of proposal and its location
– mineral facility (permanent)					
– petroleum/geothermal facility					

Notes: All licence applications under the *Mining Act 1971* and the *Petroleum and Geothermal Act 2000* within and adjacent to marine parks are referred by the Minister for Mineral Resources and Development to the Minister for Sustainability, Environment and Conservation for concurrence. A referral process is required for the approval of on-ground exploration, and production activities, as part of the relevant mining regulation protocols between DMITRE and DEWNR. This provides for case-by-case assessment of each proposed activity. This includes activities deemed consistent with with the definition of the zone. The table indicates which activities are likely to be restricted when leases, licences and permits are considered by the Ministers. Activity proposals are considered by assessing risk. Activities likely to compromise the values of any zone would not be approved. A similar process is expected to be undertaken for activities authorised under the *Offshore Minerals Act 2000* and the *Petroleum (Submerged Lands) Act 1982*.

This table may be revised over time as new technologies and techniques are developed, to ensure that new technologies are appropriately considered, consistent with marine park zone objectives.

The following types of special purpose area may be identified in accordance with section 13(1)(c) of the *Marine Parks Act 2007*. Notwithstanding the zoning of the area, the following activities will be permitted in the special purpose areas.

Special Purpose Areas (significant economic development)

Activities comprising a development or project, or that part of a development or project, within the ambit of a declaration under section 46 of the *Development Act 1993*; and

Activities comprising development approved under section 49 (Crown development and public infrastructure) or section 49A (Electricity infrastructure development) of the *Development Act 1993*.

Special Purpose Areas (harbor activities)

Activities undertaken by or on behalf of the Minister responsible for the administration of the *Harbors and Navigation Act 1993*, or a port operator, for the purposes of maintaining or improving a harbor or port. (Harbor, port and port operator have the same meanings as in the *Harbors and Navigation Act 1993*.)

Special Purpose Areas (submarine cables and pipelines)

Activities undertaken for the purposes of maintaining or improving submarine cables or pipelines comprising public infrastructure (within the meaning of section 49 of the *Development Act 1993*).

Special Purpose Areas (transhipment)

Activities comprising the establishment, maintenance or improvement of facilities for a transhipment point prescribed or to be prescribed under the *Harbors and Navigation Regulations 2009*; and

Activities comprising or connected with loading or unloading a vessel at a transhipment point prescribed under the *Harbors and Navigation Regulations 2009*.

Special Purpose Areas (anchoring)

Activities comprising anchoring a commercial vessel (within the meaning of the *Harbors and Navigation Act 1993*) in an area recommended for that purpose by way of a Notice to Mariners by the Minister responsible for the administration of the *Harbors and Navigation Act 1993*.

Special Purpose Areas (shore-based recreational line fishing)

Recreational fishing from the shore by use of a hand line or rod and line. (Hand line, recreational fishing and rod and line have the same respective meanings as in the *Fisheries Management Act 2007*.)

Special Purpose Areas (Murray Mouth dredging)

Activities associated with dredging undertaken for the purposes of maintaining or improving water flows through the mouth of the River Murray.

Special Purpose Areas (Defence Prohibited Area)

Activities undertaken by the Department of Defence in relation to the Proof and Experimental Establishment (Port Wakefield).

Special Purpose Areas (Aquaculture)

Activities authorised under the *Aquaculture Act 2001*.

Appendix 3 List of Parties Consulted

Name		Affiliation	Organisation
Natalie	Ban	Research Fellow	James Cook University
James	Bennett	Fishery Management Officer	Department for Primary Industries and Resources SA
Michelle	Besley	Fishery Manager	Department for Primary Industries and Resources SA
Andrew	Burnell	Principal Advisor	Department of Environment and Natural Resources
Jenny	Cassidy	Senior Project Officer	Department for Transport, Energy and Infrastructure
Dave	Cockshell	Chief Petroleum Geophysicist	Department for Primary Industries and Resources SA
Shaun	de Bruyn	Manager	South Australian Tourism Commission
Graham	Edgar	Senior Research Fellow	University of Tasmania
Roger	Edward	Independent Chair	Goolwa Pipi Harvesters Assoc. Inc.
Alice	Fistr	Manager, Fisheries Policy	Department for Primary Industries and Resources SA
Ian	Fitzgerald	Secretary	South Australian Recreational Fishing Advisory Council
David	Hitchcock	Director, Environment & Infrastructure	The Local Government Association of SA
Peter	Hollister	Director, Marine Transport and Policy	Department for Transport, Energy and Infrastructure
Phil	Hollow	Project Coordinators, Marine Parks Project	Department of Environment and Natural Resources
Vera	Hughes	Team Leader, Legislation and Governance	Department of Environment and Natural Resources
Ian	Janzow	Member	Metropolitan Fishers Alliance
Sean	Kalling		Tony's Tuna International
Carl	Kavina	General Manager Marine Operations	Flinders Ports Pty Ltd
Keld	Knudsen	Senior Policy Adviser	Australian Petroleum Production and Exploration Association
David	Lake	Manager	South Australian Tourism Commission
Peter	Lauer	Manager Aquaculture Policy, Planning and Environment Unit	Primary Industries and Regions South Australia
Ian	Llewellyn	Senior Project Officer	Department for Transport, Energy and Infrastructure
Nigel	Long	Director Corporate and Social Responsibility	South Australian Chamber of Mines and Energy
Neil	MacDonald	Executive Officer,	Gulf St Vincent Prawn Fisherman's Association
Neil	MacDonald	Executive Officer,	Charter Boat Owners and Operators Association

Name		Affiliation	Organisation
Angus Gary Steve Merilyn Peter Craig Justin Justin	Members		Marine Park Council
	Members		South Australian Regional Organisation of Councils
	Members	The Scientific Working Group	Department of Environment and Natural Resources
	Mitchell	Principal Policy Officer	Department of Environment and Natural Resources
	Morgan	Chairman	Wildcatch Fisheries SA
	Moriarty	Rocklobster Fisher	Rock lobster fisheries
	Nobes	Policy Manager, Fisheries and Aquaculture	Department for Primary Industries and Resources SA
	Noble	Secretary	Surveyed Charter Boat Owners and Operators Association
	Noell	Fishery Manager	Department for Primary Industries and Resources SA
	Phillips	Executive officer	Blue Crab Pot Fishers Association
Justin Phillip Keith Brenton Rob Scoresby Peter Emmanuel Sean Mark Adam Graham Chris Michael Lianos	Phillips	Executive officer	Gulf St Vincent Prawn Fishery
	Phillips	Executive Officer & Industry Liaison Officer (PIFS)	South Australian Rock Lobster Advisory Council, South East Professional Fishermen's Association, Northern Zone Rock Lobster Fishing Association
	Reddy	Environmental Sustainability Officer	Alexandrina Council
	Rowling	Fishery Manager	Department for Primary Industries and Resources SA
	Schahinger	Chairman	South Australian Recreational Fishing Advisory Council
	Shaw		Department for Primary Industries and Resources SA
	Shepherd	Senior Research Fellow	South Australian Research and Development Institute
	Short	Project Director	Department for Transport, Energy and Infrastructure
	Sloan	Manager, Aquaculture Planning Unit	Department for Primary Industries and Resources SA
	Sloan	Director of Fisheries and Aquaculture Policy	Primary Industries and Regions South Australia
Mark Adam Graham Chris Michael Lianos	Spencer	Fishery Manager	Department for Primary Industries and Resources SA
	Stanford	Commercial Analyst	South Australian Tourism Commission
	Tapley	President	South Australian Sardine Industry
	Thomas	Branch Manager	Department of Environment and Natural Resources
	Tokley	Executive officer	Central Zone Abalone Fishery
	Triantafillos	Fishery Manager	Department for Primary Industries and Resources SA

Name		Affiliation	Organisation
Hank	van der Wijngaart	President	Scuba Divers Federation of SA
Tim	Ward	Program Leader, Wild Fisheries	South Australian Research and Development Institute
Paul	Watson	Executive Officer	South Australian Sardine Industry Association
Peter	Welch	Executive Officer	Marine Fishers Association
Ian	Winton	Deputy Chairman	South Australian Recreational Fishing Advisory Council
Alison	Wright	Project Coordinator, Marine Parks	Department of Environment and Natural Resources
Qifeng	Ye	Acting Chief Scientist	South Australian Research and Development Institute

Appendix 4 MPSIAT feedback

Appendix Table 4-1 General views about the Encounter Marine Park

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
Fully understand scientific arguments in favour of this Marine Park	6	2	0	5	5	0
Establishment of this Marine Park is based on sound scientific evidence	8	3	2	1	3	1
DENR Preliminary Marine Park zone for this Marine Park is about right	11	4	0	2	1	0
MPLAG zone advice for this Marine Park is about right	2	5	1	7	3	0
More information is needed about this Marine Park & how it will operate	3	3	1	7	4	0

Note: 18 of 28 members responded to the MPSIAT.

Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix Table 4-2 Tourism, education & wellbeing impacts for Encounter Marine Park

	Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely	Don't know
MP likely to increase tourism in our area						
DENR zone	8	3	1	3	3	0
MPLAG zone	7	4	3	3	1	0
There will be more opportunity for charter boats to exploit ecotourism opportunities						
DENR zone	8	4	1	1	4	0
MPLAG zone	6	3	4	4	1	0
MP will provide increased opportunities for education about marine life						
DENR zone	5	5	1	4	3	0
MPLAG zone	4	2	4	8	0	0
MP will provide increased opportunities for our understanding of marine conservation issues						
DENR zone	5	2	2	6	3	0
MPLAG zone	4	4	1	7	2	0
MP will create new employment opportunities for local people						
DENR zone	8	5	1	4	0	0
MPLAG zone	8	5	2	2	1	0
MP will have no impact (positive or negative) on me or my family						
DENR zone	7	6	0	1	4	0
MPLAG zone	4	6	3	4	1	0
MP will improve the quality of life of people in my community						
DENR zone	12	3	0	0	3	0
MPLAG zone	8	4	3	3	0	0
MP will improve my personal quality of life						
DENR zone	12	2	0	1	3	0
MPLAG zone	10	3	2	0	3	0
MP will negatively change our way of life*						
DENR zone	3	3	2	3	7	0
MPLAG zone	2	2	5	4	5	0

Note: 18 of 28 members responded to the MPSIAT. *Question is negatively scored.

Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix Table 4-3 Culture and heritage impacts for Encounter Marine Park

	Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely	Don't know
MP will respect the interests of Aboriginal communities						
DENR zone	4	1	3	5	2	3
MPLAG zone	2	1	6	6	0	3
MP will help preserve Aboriginal culture & heritage						
DENR zone	5	2	3	5	1	2
MPLAG zone	3	1	6	5	0	3
MP will help preserve local Australian culture & heritage						
DENR zone	10	3	0	3	1	1
MPLAG zone	5	4	2	6	0	1
MP will help maintain our community identity as a fishing centre						
DENR zone	12	2	1	0	3	0
MPLAG zone	9	3	2	2	2	0

Note: 18 of 28 members responded to the MPSIAT.

Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix Table 4-4 Recreation & fishing impacts for Encounter Marine Park

	Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely	Don't know
MP will help to encourage recreational activities						
DENR zone	9	5	0	2	2	0
MPLAG zone	5	9	2	0	2	0
MP will discourage recreational fishing*						
DENR zone	3	2	0	6	7	0
MPLAG zone	4	2	3	5	4	0
MP will bring better local facilities e.g. for recreation & fishing						
DENR zone	12	4	0	2	0	0
MPLAG zone	6	10	0	2	0	0
MP will bring a wider range of activities for local people to participate in						
DENR zone	10	4	0	4	0	0
MPLAG zone	6	9	0	3	0	0
Any significant losses in commercial fishing would be very damaging for my family*						
DENR zone	2	2	2	3	8	1
MPLAG zone	2	2	4	3	6	1
Any significant losses in commercial fishing would be very damaging for the community*						
DENR zone	0	2	1	5	10	0
MPLAG zone	1	3	4	4	6	0

Note: 18 of 28 members responded to the MPSIAT. *Question is negatively scored.

Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix Table 4-5 Population & housing impacts for Encounter Marine Park

	Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely	Don't know
MP will bring too many tourists here & change the quality of our life						
DENR zone	12	3	1	1	1	0
MPLAG zone	9	6	3	0	0	0
MP will see too many locals leaving the area						
DENR zone	4	4	3	3	3	1
MPLAG zone	2	8	3	3	2	0
MP will increase property prices making it more difficult for locals to buy houses						
DENR zone	8	6	3	0	1	0
MPLAG zone	8	6	2	2	0	0
MP will lead to a lowering of beachfront property prices						
DENR zone	4	4	2	3	4	1
MPLAG zone	4	6	1	3	3	1

Note: 18 of 28 members responded to the MPSIAT.

Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix Table 4-6 Community response impacts for Encounter Marine Park

	Very unlikely	Unlikely	Neither likely nor unlikely	Likely	Very likely	Don't know
Our community will adapt well to having the MP						
DENR zone	5	6	1	4	1	1
MPLAG zone	2	3	3	8	1	1
Our community is strong enough to manage changes brought by the MP						
DENR zone	2	5	1	7	1	2
MPLAG zone	2	3	1	10	1	1
A number of potential business opportunities will be brought by the MP						
DENR zone	7	6	0	1	2	2
MPLAG zone	5	6	2	4	0	1
Need for training programs to help people adapt to new occupations associated with the MP						
DENR zone	3	4	4	4	1	2
MPLAG zone	3	6	2	3	2	2
MP will divide our community into those for & against it*						
DENR zone	1	0	1	8	7	1
MPLAG zone	0	2	3	7	5	1
MP will be a source of pride to this community						
DENR zone	5	7	2	2	1	1
MPLAG zone	4	5	4	3	1	1
MP will increase number of events & other activities that bring the community together						
DENR zone	9	4	3	1	0	1
MPLAG zone	5	8	3	1	0	1

Note: 18 of 28 members responded to the MPSIAT. *Question is negatively scored.

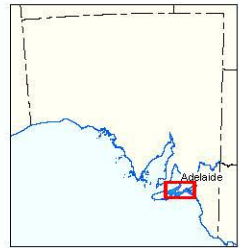
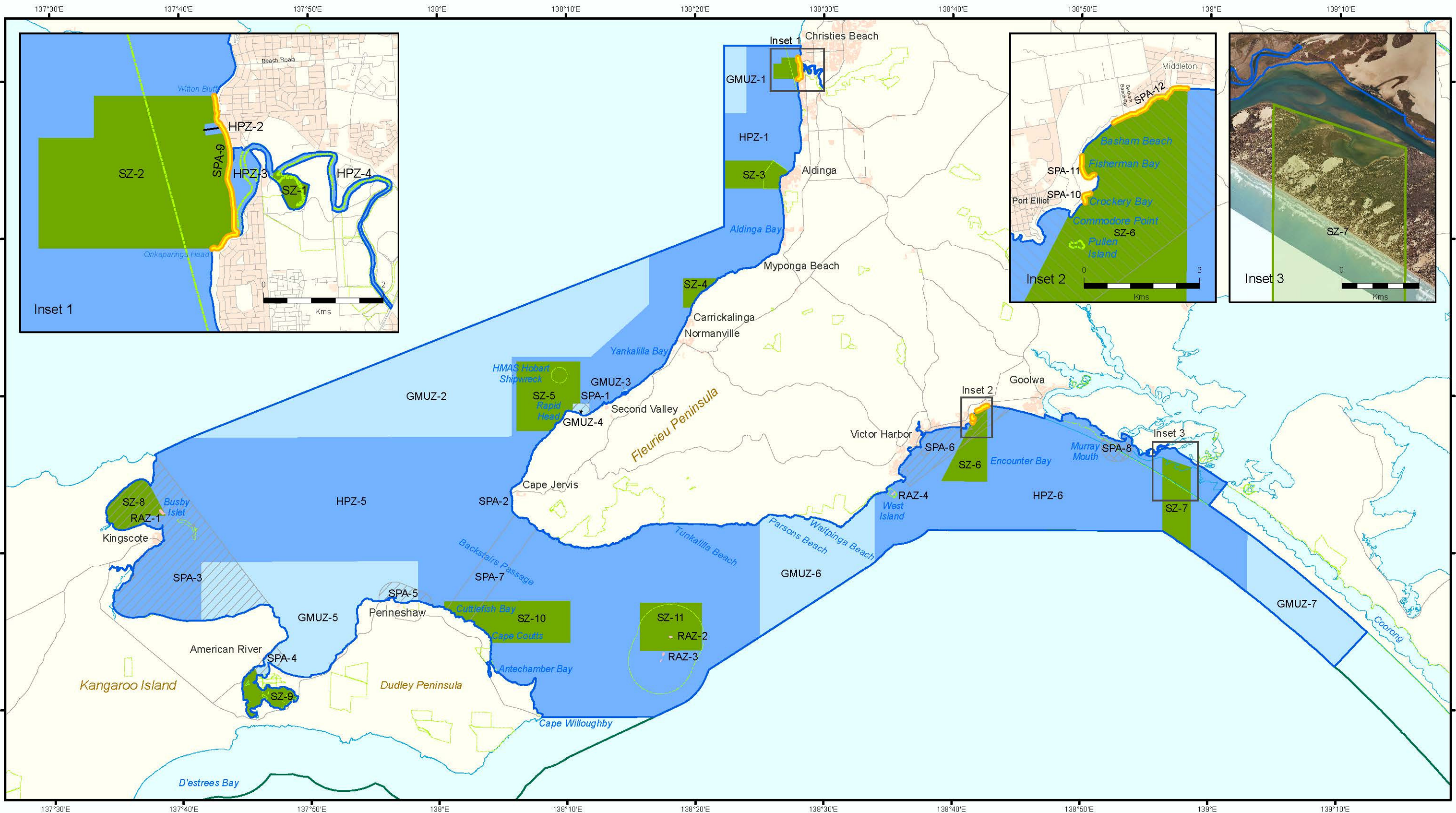
Source: Australian Workplace Innovation and Social Research Centre MPSIAT 2011

Appendix 5 Map of Marine Park Showing Draft Zoning

Appendix Figure 5–1 Map of Marine Park Showing Draft Zoning

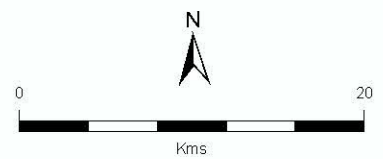
See next page.

Marine Park 15 - Encounter



- Marine Park Draft Zoning**
- Restricted Access Zone (Existing)
 - Sanctuary Zone
 - Habitat Protection Zone
 - General Managed Use Zone
 - Special Purpose Area (Harbor Activities)
 - Special Purpose Area (Murray Mouth Dredging)
 - Special Purpose Area (Submarine Cables and Pipelines)
 - Special Purpose Area (Shore-based recreational line fishing)

- Topographic**
- Built Up Area
 - Marine Park Boundary
 - Existing Reserves under other Acts
 - Coastal Waters of the State
 - Coastline (median high water)
 - Jetty
 - Major Road



THIS MAP IS INDICATIVE ONLY AND IS NOT INTENDED FOR NAVIGATIONAL PURPOSES

Produced by Marine Parks Project
Department of Environment, Water and Natural Resources
GPO BOX 1047 Adelaide SA 5001
www.marineparks.sa.gov.au

Data Source Marine Parks, NPWSA, Topographic Data, Coastline (median high water) - DEWNR
Coastal Waters of the State - Geoscience Australia

Compiled Projection Datum 6 August 2012
Lambert Conformal Conic
Geocentric Datum of Australia, 1994

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