



DISCUSSION PAPER SUPPORTING THE AQUACULTURE (ZONES—SMOKY BAY) POLICY 2007

Saddle Peak intertidal aquaculture zone
Smoky Bay intertidal aquaculture zone
Missiessy intertidal aquaculture zone
Vinya intertidal aquaculture zone
Eyre Island intertidal aquaculture zone
Smoky Bay South subtidal aquaculture zone
Smoky Bay North subtidal aquaculture zone
Smoky Bay (holding) intertidal aquaculture zone
Smoky Bay aquaculture emergency zone
Eyre Island aquaculture exclusion zone

Gazetted on 4th October 2007

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1 EXECUTIVE SUMMARY

This discussion paper supports the Aquaculture (Zones Smoky Bay) Policy 2007 ('The Policy'). The Policy has been developed to ensure the ecologically sustainable development of aquaculture and associated activities in the Smoky Bay region. The Policy aims to provide certainty for industry stakeholders, improve community confidence and facilitate the consolidation of existing industry and opportunities for moderate aquaculture development.

Smoky Bay currently has extensive intertidal oyster aquaculture development and a small amount of subtidal oyster development.

The bay is twenty kilometres long, with depths of generally less than ten metres and a seabed covered by patches of sand and seagrasses. At the southern end of the bay is Smoky Bay township with a population of approximately 440, a caravan park, a large boat ramp and a dedicated land based Aquaculture Park with a number of large oyster processing sheds.

The Policy affects the waters from Little Eyre Island in the West to Smoky Bay township in the East and from six kilometres South of Laura Bay to a few kilometres south of Cape Missiessy near Windippy Hill (Figure 1). Currently, Smoky Bay has 144.25 hectares of intertidal oyster development and 40 hectares of subtidal oyster development. The Policy maintains the level of development for the intertidal culture area, however one additional hectare will be made available in each of the intertidal zones for the purposes of research. The subtidal areas has been increased to a total of 80 hectares (Table 1). While there is some existing filter feeding mollusc (oyster) aquaculture within the subtidal zone, any further development in the subtidal area will be restricted to non-filter feeding molluscs in the Smoky Bay (North) subtidal aquaculture zone and mussels will not be permitted in any of the zones. The total zone area covers 14,149.5 hectares of which less than 2% is available for lease allocation (Table 2).

Table 1: Changes in aquaculture use under this policy

Aquaculture Zone	New development
Intertidal zones	An additional 1 ha in each zone for research purposes only, but no further development
Subtidal zones	40 ha of new development
Aquaculture emergency zone	As required
Aquaculture exclusion zone	No aquaculture development
TOTAL	40 ha of new development

Table 2: Area descriptions of the aquaculture zones in this policy (ha)

Aquaculture Zone Area	Current Licensed Area	Zone Area	Additional Licensed Area	Total Area Available
Intertidal	144.25*	501.4	0	144.25*
Subtidal	40	3,787.5	40	80
Emergency	0	171.4	0	0
Exclusion	0	9,699.1	0	0
Total	184.25	14,159.4	40	224.25

* There is, in addition, 1 hectare in each intertidal area available for research purposes only.

1.1 Zones

The following zones have been established:

- Saddle Peak, Smoky Bay, Missiessy, Vinya and Eyre Island aquaculture zones catering for intertidal aquaculture;
- Smoky Bay (holding) intertidal aquaculture zone for the short term storage of oysters;
- Smoky Bay South and Smoky Bay North subtidal aquaculture zones catering for subtidal aquaculture;
- Smoky Bay aquaculture emergency zone; and
- Eyre Island aquaculture exclusion zone.

Approval of leases and licences in these zones will be subject to requirements under the *Aquaculture Act 2001*; assessment of individual site suitability; criteria outlined in the Aquaculture Tenure Allocation Policy; ongoing environmental monitoring; and other relevant plans and policies.

Mussels are not permitted in any of the zones and any further development in the subtidal zones will only permit non-filter feeding molluscs in the Smoky Bay (North) subtidal aquaculture zone.

1.2 Saddle Peak Intertidal Aquaculture Zone

The Saddle Peak intertidal aquaculture zone provides for 20 hectares of intertidal filter feeding mollusc aquaculture development. At the time of this report being prepared all of this area had been allocated. The zone covers 62.0 hectares. The Saddle Peak intertidal zone has wide intertidal flats making it ideal for intertidal aquaculture. An additional 1 hectare is made available in this zone for the purposes of research.

1.3 Smoky Bay Intertidal Aquaculture Zone

The Smoky Bay intertidal aquaculture zone provides for 19.9 hectares of intertidal filter feeding mollusc aquaculture development. At the time of this report being prepared all of this area had been allocated. The zone covers an area of 66.9 hectares. The Smoky Bay intertidal aquaculture zone has broad

intertidal flats, making it ideal for intertidal aquaculture. An additional 1 hectare is made available in this zone for the purposes of research.

1.4 Missiessy Intertidal Aquaculture Zone

The Missiessy intertidal aquaculture zone provides for 23 hectares of intertidal filter feeding mollusc aquaculture development. At the time of this report being prepared all of this area had been allocated. The zone covers 107.7 hectares. The Missiessy intertidal aquaculture zone has broad intertidal flats ideal for intertidal aquaculture. An additional 1 hectare is made available in this zone for the purposes of research.

1.5 Vinya Intertidal Aquaculture Zone

The intertidal aquaculture zone provides for 61 hectares of intertidal filter feeding mollusc aquaculture development. At the time of this report being prepared all of this area had been allocated. The zone covers an area of 179.5 hectares. The intertidal aquaculture zone has broad intertidal flats ideal for intertidal aquaculture. An additional 1 hectare is made available in this zone for the purposes of research.

1.6 Eyre Island Intertidal Aquaculture Zone

The Eyre Island intertidal aquaculture zone provides for 20 hectares of intertidal filter feeding mollusc aquaculture development. At the time of this report being prepared all of this area had been allocated. The zone covers 81.0 hectares. The Eyre Island intertidal aquaculture zone has broad intertidal flats ideal for intertidal aquaculture. An additional 1 hectare is made available in this zone for the purposes of research.

1.7 Smoky Bay (Holding) Intertidal Aquaculture Zone

The Smoky Bay (holding) intertidal aquaculture zone is provided for the short term holding of Pacific oysters (*Crassostrea gigas*) that are grown within Smoky Bay. This zone is not for commercial development. A total of 0.35 hectares is provided to lease holders from Smoky Bay. The site is protected and provides a temporary storage for oysters prior to harvesting or staging to other zones. This zone is only for temporary storage of oysters, and only oysters associated with allocated lease sites in Smoky Bay are permitted in the area. The zone is only to be used by license holders with sites in Smoky Bay. This zone is necessary to provide a location for the safe holding of oysters that is out of strong weather and that is accessible for holding oysters to allow consistent harvesting even in rough weather when the other sites are not accessible. The zone covers an area of 4.3 hectares.

1.8 Smoky Bay South Subtidal Aquaculture Zone

The purpose of this zone is to provide for a total of 40 hectares of development. This zone is fully allocated with an existing 40 hectares of filter feeding mollusc (oyster) sites within this zone. This zone covers an area of 1,621.3 hectares.

1.9 Smoky Bay North Subtidal Aquaculture Zone

The purpose of this zone is to provide for a total of 40 hectares of development for non-filter feeding molluscs such as abalone. This zone covers an area of 2,166 hectares.

1.10 Smoky Bay Aquaculture Emergency Zone

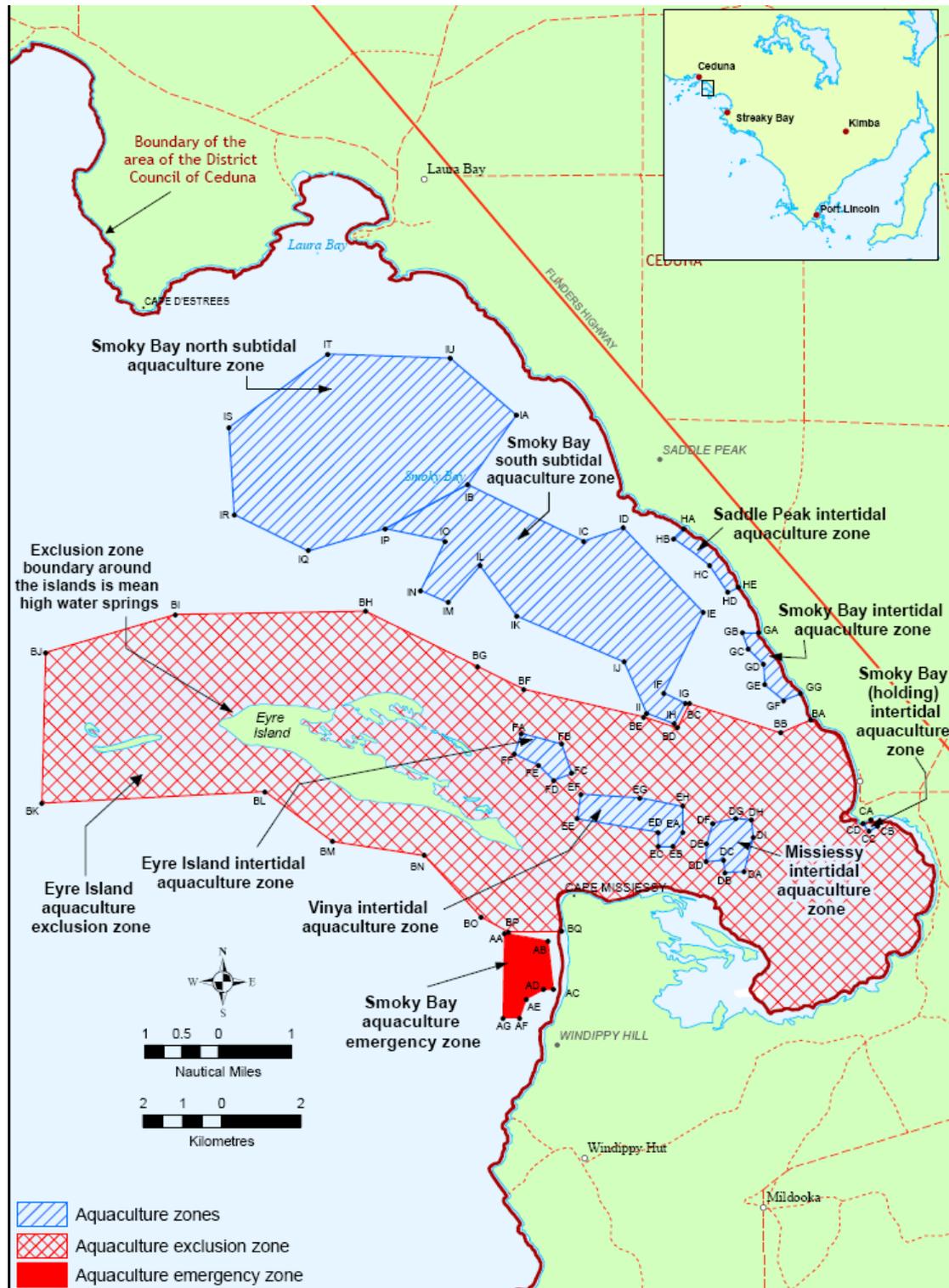
An emergency zone of 171.4 hectares is established on the southern side of Cape Missiessy. No aquaculture development is allocated in this zone. The emergency zone has been established for emergency relocation of aquaculture operations. At such a time as this zone is used, an emergency lease must be issued, the Minister being satisfied that emergency circumstances exist such that measures are required to assist the protection of the environment or the preservation of endangered aquaculture stock. The Minister must notify the EPA immediately upon grant of an emergency lease. The lease will be issued for three months or less and can be renewed for successive terms up to six months.

1.11 Eyre Island Aquaculture Exclusion Zone

The Eyre Island exclusion zone covers 9,699.1 hectares. No aquaculture is permitted in this zone. The zone establishes a buffer between aquaculture development and conflicting marine resource users and areas of high conservation significance. The policy precludes aquaculture developments adjacent to shipping and mooring facilities, navigational channels, conservation areas, directly in front of towns and areas of high visual amenity.

The Eyre Island aquaculture exclusion zone extends from immediately north of Smoky township along the coast to Cape Missiessy, then one kilometre seaward of Eyre and Little Eyre Islands. On the northern side of Eyre Island the Exclusion zone adjoins the Smoky Bay subtidal zone. The aquaculture zones within this Exclusion zone are not part of the exclusion zone, i.e. holding zone, Eyre zone, Vinya and Missiessy zones.

Figure 1: Aquaculture zones and aquaculture exclusion zone in Smoky Bay



2 INTRODUCTION

This discussion paper has been developed to inform and involve all stakeholders in the decision making process for aquaculture allocation in the Smoky Bay region. The Policy will promote the orderly and efficient development of the aquaculture industry and recognises the industry as a legitimate user of the State's marine resources, providing guidance and increased assurances for access to the marine resources for the aquaculture industry.

Smoky Bay is protected from southerly and south-westerly swells. The area has large sandy mudflats grading into extensive seagrass meadows in waters generally less than ten metres deep (Edyvane 1999).

The aquaculture industry has developed rapidly in recent years. Through its relatively large requirement for labour and material inputs, the industry has shown the potential to increase the complexity and diversity of local economies. In total, the value of aquaculture industry output in South Australia was estimated at over \$242 million in 2004/05. In terms of employment, 3,366 jobs were generated through the aquaculture industry including direct, downstream and flow on employment, mainly in rural and regional areas (EconSearch 2006).

Aquaculture in Smoky Bay has previously been managed under the Far West Aquaculture Management Plan (PIRSA 1996) prepared under the *Fisheries Act 1982*. With the introduction of the *Aquaculture Act 2001*, there is a need to review this plan. This ensures many community and industry issues are dealt with at the zone planning phase rather than during individual application processes.

The policy will have effect 5 years from the date of gazettal. As such there is a requirement to incorporate the future needs of the Government, aquaculture industry and community at this time.

The policy will manage current intertidal oyster developments and provide limited potential for expansion of subtidal non-filter feeding aquaculture reflecting the policies cautious approach in limiting the additional area available for development. The Policy introduces objectives for the development and management of this resource within a framework of ecologically sustainable development.

2.1 Objectives

- Objective 1: To provide for the development of a sustainable aquaculture industry in the Smoky Bay region.
- Objective 2: To protect proclaimed conservation areas in the Smoky Bay region.
- Objective 3: To protect historic shipwrecks and sites of Aboriginal heritage value in the Smoky Bay region.
- Objective 4: To minimise the impact of aquaculture development on the tourism and residential qualities of the Smoky Bay region.

Objective 5: To minimise the impact of aquaculture development on fishing in the Smoky Bay region.

Objective 6: To minimise the impact of aquaculture on sensitive species and habitat in the Smoky Bay region.

3 BENEFITS OF AQUACULTURE

South Australia's natural geography positions the State well to maximise the opportunities aquaculture presents. One attraction for the aquaculture industry is the excellent water quality that stems from low levels of runoff because of the low rainfall and sparse regional population. The State's aquaculture products have a sound reputation in export markets, where a consistent supply and good quality product is able to attract premium prices.

Aquaculture allows producers to plan their harvest to utilise the variabilities in market demand and to manage processing capacity, storage and transport availability. To improve, maintain and protect this reputation, aquaculture must be appropriately managed to prevent potential risks to the environment and to minimise conflict with other users of the waters and adjacent coast.

3.1 Economic impacts of aquaculture

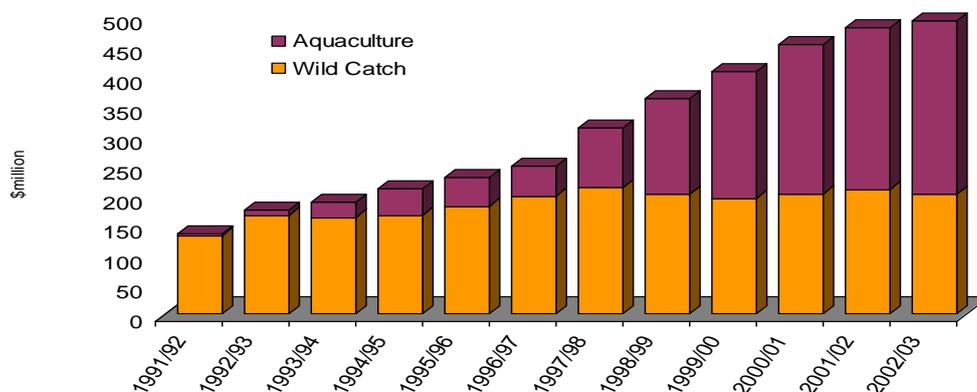
The aquaculture industry plays an important role in creating wealth and prosperity for the State, particularly in regional communities (Herrera et al. 2004). In January 2005, the South Australian seafood industry (comprising aquaculture, wild fishing and post harvest sectors) released the Seafood Food Plan, committing the industry to building its value base from \$900m in July 2003 to \$2b in 2015 (Seafood Industry Development Steering Committee 2006). Figure 2 shows how aquaculture production has experienced exceptional growth (averaging 50% per annum) over the last decade while growth from wild catch production has been reasonably stable.

South Australia produces 30% of Australia's aquaculture production and 18% of the national seafood production (ABARE 2006). This trend is reflected worldwide with expectations that, by 2030, aquaculture will produce 50% of the global seafood demand (FAO 2004, FAO 2006).

Aquaculture continues to grow more rapidly than all other animal food-producing sectors, with an average annual growth rate for the world of 8.8 percent per year since 1970, compared with only 1.2 percent for capture fisheries and 2.8 percent for terrestrial farmed meat production systems (FAO 2006)

This Policy will assist the National Aquaculture Industry Action Agenda targets of \$2.5 billion production from the aquaculture sector by 2010. The State aquaculture industry body, the SA Aquaculture Council has produced industry targets. They estimate that by 2013, aquaculture production in South Australia will generate a farm gate value of \$650 million.

Figure 2: South Australia's seafood production trends



Source: Firsia Scorecard

The value of the South Australian aquaculture industry output (direct and flow-on) was estimated at over \$518 million in 2004/2005, a total direct output of over \$242 million (farm-gate and associated direct business turnover impacts in the processing, transport, retail and food sectors) and further business turnover (output) of \$276 million in other South Australian industries (EconSearch 2006).

The value of the South Australian oyster industry output (direct and flow-on) was estimated at over \$118 million in 2004/2005, a total direct output of over \$56 million (farm-gate and associated direct business turnover impacts in the processing, transport, retail and food sectors) and further business turnover (output) of \$62 million in other South Australian industries (EconSearch 2006).

3.2 Social impacts of aquaculture

In terms of employment 1,541 jobs were generated directly in aquaculture, 346 jobs in downstream activities and approximately 1,478 flow on jobs generated in other sectors of the State's economy in 2004/2005 (EconSearch, 2006).

The aquaculture sector can be seen to provide social benefits through jobs and additional income, which leads to improved social cohesion, increased training opportunities, additional business opportunities and improved social stability, particularly in rural and regional South Australia.

State government predictions are that, by 2010, the population on Eyre Peninsula will decline by 2% if changes to the economic structure are not implemented (DTUPA 2000). The area is experiencing reduced value of agriculture production and decreasing employment in the traditional land based agricultural farming sector. Additionally, the periodic fluctuations typical in agriculture have an effect on the support and service sectors on the Eyre Peninsula.

The positive social impacts of aquaculture employment have been advantageous to towns such as Ceduna, Cowell and Arno Bay. Smoky Bay had a declining population until recently when the oyster aquaculture sector

increased demand for workers in the town. The town has expanded significantly in recent years and proposed developments cater for an extra 20 new houses.

3.3 Regional impacts of aquaculture

In 2004/05 oyster farming was responsible for the direct employment of 382 people in the Eyre Peninsula region. Associated downstream activities created employment for 49 people, and flow-on business activity was estimated to generate a further 110 jobs (EconSearch 2006).

The aquaculture industry in South Australia has developed rapidly in recent years. Through its relatively large requirement for labour and material inputs, the industry has shown the potential to increase the complexity and diversity of local economies. The demand for local labour, goods and services can help offset the contraction of other local industries and may assist in alleviating the range of economic and social pressures associated with declining regional economies.

Aquaculture development in many regions has been seen to have a positive impact through diversified training and employment opportunities and an injection of income and jobs, including new youth job opportunities, into regional areas (many of which are socially and economically disadvantaged).

The jobs on aquaculture farms require locally based, permanent and skilled staff. There is constant employment in fish husbandry, environmental management, processing, boat and net maintenance. This consistent workload balances out the peaks and troughs of tasks and provides ongoing employment including labouring, professional, scientific or managerial positions. Workers tend to live close to their work site, providing significant social cohesion, more business opportunities and greater economic stability to the local area.

The regional impact of the aquaculture industry has, to date, been largely concentrated in the Eyre Peninsula region, reflecting the dominance of tuna and oyster farming. However, other sectors such as yellowtail kingfish, mussels and abalone have increased significantly in recent years in terms of production volume and value of production and this has resulted in the spread of benefits to other regional areas.

In addition to the regional impacts generated by recurrent expenditures in the aquaculture sector, further economic impacts are generated by the investment of profits, by aquaculture operators, in local ventures. As an example, the current profitability in the tuna farming sector near Port Lincoln underpins substantial local investment by tuna farmers in the local cannery, shipyard, marinas, property (eg hotels) and other industries (eg viticulture).

3.4 Infrastructure factors

Much of South Australia that is best suited to aquaculture development is comparatively remote from major regional centres. Hence adequate power, water, road and other transport systems are needed to support marine based industry development in the regions. Coupled with this is the need for harbour and breakwater facilities to support marine activities. As the demand for

aquaculture increases, so will the need for appropriate infrastructure, which can cater for current demand and for future expansion.

Oyster farming generally requires small to medium scale land based support infrastructure to service the marine based farms. Smoky Bay has a recreational jetty and a large boat ramp. Smoky Bay also has a land based aquaculture park that consolidates aquaculture activities and activities ancillary to aquaculture in the same areas. Sealed roads connect the township of Smoky Bay and Ceduna with Adelaide via the Flinders Highway. Ceduna to the north is well serviced by larger infrastructure such as boat ramps, slipways and mooring facilities.

Lack of housing has been indentified by a number of Councils as a key blockage to the future development of the aquaculture industry (Planning SA 2003, Planning SA 2005).

4 MANAGEMENT OBLIGATIONS

Management obligations are those requirements an aquaculture operator must undertake according to the *Aquaculture Act 2001* and other relevant legislation. Penalties for failures of compliance include expiation fees, fines and suspension or cancellation of licence.

4.1 Environmental monitoring and management

Environmental regulation is supported through the *Aquaculture Regulations 2005*, which prescribe particulars for waste management, chemical use and environmental monitoring and reporting.

All aquaculture developments are managed with regard to the principles of ecologically sustainable development (ESD). Accordingly, applications to undertake aquaculture are subject to a risk assessment that considers the potential environmental, social and economic risks that may arise should the operation be licensed. This risk assessment process is consistent with the PIRSA Aquaculture Environmental Management Framework and the nationally agreed ESD framework (Fletcher et al. 2004). The environmental risk assessment component considers the nature of the specific activity relative to the environment in which it will be undertaken at different spatial scales, namely; at the level of the individual site, at the bay or catchment level and at the regional or whole-of-industry level. Risks are ranked and adaptively managed according to their priority and complexity. Risks ranked unacceptably high require immediate modification of the application or development whereas those ranked as negligible or low may only require monitoring and reporting with a management response only necessary if levels deviate from the expected range. Developments that entail moderately ranked risks may be allowed to proceed with more frequent monitoring and reporting requirements and appropriate management responses. Each operation is required to provide an annual Environmental Monitoring Program (EMP) report that provides information relating to those risks that require ongoing adaptive management.

For intertidal mollusc developments, the potential environmental risks tend to be limited to changes to the seafloor, 'escaped' shellfish forming feral populations and the incidence of diseases.

Representative oyster farms and control sites within each growing region or bay are chosen to monitor whether there are any impacts to the seafloor and all licensees are required to provide information on the remaining issues via an annual EMP report.

4.2 Marine mammal and other animal interactions

In this State, there have been no reported incidences of negative interactions (such as entrapments or entanglements) between mollusc aquaculture operations and marine animals. The requirement to report interactions form part of licence conditions and Regulations under the *Aquaculture Act 2001*. If interactions occur then modifications to farming practices may be required.

Licensees are required to submit a Seabird and Large Marine Vertebrate Interaction Avoidance Strategy, which satisfies the Minister, at the commencement of operations. The strategy will detail what procedures the licensee will implement to minimise the risk and manage incidences of entanglement or entrapment of seabirds, dolphins, seals, sharks and whales. Operators may be audited against the operating practices detailed in their strategy at any time. Failure to comply with the strategy may result in an expiation fee or fine.

4.3 Health controls

A range of health controls is included in the management of licensed aquaculture activities. All applications for new aquaculture licences are assessed for health risks as part of the ESD assessment. Regulations under the *Aquaculture Act 2001* require that operators report to the Department of Primary Industries and Resources South Australia (PIRSA) any increases in background mortality and must not move any animals showing signs of clinical disease without Ministerial approval. Requirements designed to manage other on-farm activities are included in a variety of legislation and policy.

Diseases of particular concern and those that are regarded as posing particular threats to environmental, economic or social processes are listed as notifiable under the *Livestock Act 1997* and it is an offence under that Act to fail to report the occurrence, or suspected occurrence, of a notifiable condition. Translocation of organisms is managed through a process of Import Risk Analysis and the outcomes of these analyses, which include factors to reduce risk of disease or pest introduction and consideration of genetic integrity, are included in Orders under the Livestock Act, including the Livestock (Restrictions on Entry of Aquaculture Organisms) Notice 2005. Use of any therapeutants or treatments can be conducted only under a Ministerial approval (for off-label use as defined by the *Veterinary Practice Act 2003*) or under conditions specified by the Australian Pesticides and Veterinary Medicines Authority either on the label of registered products or included in Minor Use Permits.

Disease issues are seriously considered during the licence application stage by conducting a risk assessment that takes into consideration the culture technique, technology and specific environment of the application.

Activities that may pose a risk have risk mitigation procedures imposed and are carefully monitored, including the reporting of mortalities and translocation activities.

4.4 Exotic species and preservation of biodiversity

The most efficient and therefore economic species for aquaculture production are those that are fast growing. These may not necessarily be native species.

There are potential risks associated with the introduction of organisms not from the local environment. For the protection of the aquaculture industry, and of the natural environment, controls must be maintained on the introduction and movement of aquatic organisms, bearing in mind the potential risks involved with aspects of disease and genetic manipulation. The primary concerns associated with the introduction of introduced organisms are that they may form feral populations, which may compete for habitat and reduce the availability of nutrients to local organisms.

Genetically modified organisms proposed for use in South Australia would require approval by the Commonwealth Office of the Gene Technology Regulator. Other potential genetic issues are addressed as part of the ESD risk assessment and licence application process.

4.5 Stock escapes

The escape of aquaculture stock from a site is considered during the ESD risk assessment of the application. This the best stage to consider the level of risk presented by the species under consideration and the technology used. Consideration will be given to the source of the cultured stock and whether it is present in the area of the farm. Regulations under the *Aquaculture Act 2001* require operators be proactive by undertaking the development of escape prevention strategies and immediately reporting escaped stock.

The Pacific oyster (*Crassostrea gigas*) is not endemic to the South Australian marine environment but has cultivated for many years on oyster leases. A native species to Japan, it was first introduced to Tasmania in the 1940s for aquaculture purposes and subsequently introduced to South Australia in 1969.

Pacific oysters are relatively fast growing and have a high rate of reproduction. They spawn during summer and can produce around 30 to 40 million eggs each. Tide and current transport the planktonic eggs and larvae of Pacific oysters. On the west coast in Denial Bay and Smoky Bay, Pacific oyster larvae originating from the many commercial oyster leases in the area have spread and settled along the shoreline of nearby bays and islands. Wild Pacific oysters are now found in many places on limestone reef in the intertidal and shallow subtidal zones, particularly around the cape near Thevenard.

Hone has reported small populations of feral Pacific oysters occurring in the intertidal zone around Denial Bay and Franklin Harbor (Hone 1995, cited by Ashman 1996), although these populations are not considered to have reached pest status. Furthermore, at least one population has persisted at an abandoned lease site (Murat Bay) and had bred three to four times when the report of this population was published (Vandeppeer 1995). Oyster growers have reported the presence of feral oysters at Denial Bay, Streaky Bay, Smoky Bay, Nepean Bay and Franklin Harbor PIRSA (2006).

4.6 Doing it better - research and adaptive management

Evidence based policies require robust research to inform the decision making process. As such PIRSA Aquaculture has initiated several projects with the Fisheries Research and Development Corporation (FRDC) to improve our knowledge and inform our policies, in particular, the PIRSA /FRDC Innovative Solutions for Aquaculture Planning and Management Program. This suite of projects aims to develop tools to ensure a sustainable and competitive aquaculture industry for South Australia. These tools will:

- identify more effective ways to manage aquaculture;
- minimise the regulatory burden on industry; and
- ensure that environmental considerations for South Australian aquaculture remain a clear priority.

Research is currently underway in the areas of;

- a) Environmental audits of marine aquaculture – this project aims to quantify the real and perceived environmental risks surrounding aquaculture and further develop and refine environmental monitoring;
- b) Addressing seal interactions – this project is designed to provide a better understanding of how seals behave in the marine environment and has already produced results of significant conservation value. The data gathered will allow zones to be located taking into consideration knowledge of seal habitat use around Port Lincoln and the West Coast. This project represents a considerable increase in pinniped research nationally;
- c) Spatial impacts and carrying capacity – this project aims to further refine the mathematical modelling of carbon and nutrient deposition from aquaculture farms;
- d) Parasite interactions between wild and farmed yellowtail kingfish – this project aims to proactively assess the risks to both wild and farmed stocks from parasite transmission; and

4.7 R&D area allocation

Research into commercially related new species or technologies and improved environmental management can be hindered by delays in getting approvals and subsequent access to suitable sites. It is inconvenient or unsuitable for researchers to use industry sites for research purposes. This proposal sets aside a small area that is not for commercial use but available solely for research purposes. One hectare in each of the intertidal aquaculture zones will be made available for the purposes of research.

4.8 Disaster resilience

Marine based aquaculture is particularly exposed to the uncontrollable elements of the weather. Being prepared to deal with the vagaries of the weather or other disasters, natural or man made, requires foresight and planning to minimise loss of aquaculture stock from such events, and to reduce social and economic disruptions that may arise from them.

Industry must have foresight and be prepared. Foresight is the key to reducing potential costs from disasters. The government planning process must also be flexible.

To this end, this Policy has for the first time developed an emergency zone. This will add flexibility for dealing with disasters such as algal blooms, oil spills and diseases. The principle aim is to prevent stock loss in the event of a disaster.

The emergency zone is an alternative area approved to receive stock. The Minister must be satisfied that the event is an unforeseen disaster and stock may be kept there for a maximum of six months. Planning for emergency response is included in the Aquatic Animals Chapter of the PIRSA Emergency Management Documents and various Aquavetplan Manuals.

4.9 Site decommissioning

There will be times when an aquaculture site in the zone is no longer being used. In this case the lease contract requires that the site to be rehabilitated and reinstated by the lessee at the expiry of the lease. The lease also requires the operator to be party to an approved indemnity scheme or bank guarantee.

5 POLICY STATUS

The Policy has been developed in conjunction with the Aquaculture Advisory Committee. The Policy has been developed under the *Aquaculture Act 2001* and will be recognised under the *Development Act 1993*.

The Policy has been designed to guide the development of an ecologically sustainable aquaculture industry within the sustainable limits of available marine resources and their existing use. The Policy is not designed as a comprehensive management framework for the protection of the whole marine environment. The Policy cannot consider all issues for individual aquaculture applications to the detail required for a complete assessment of the environmental risks of an application. Each application within a zone will be subject to an ESD Assessment as part of the licence application process in accordance with the PIRSA Aquaculture Environmental Management Framework Policy. However, the Policy does provide certainty for developers and those concerned with broader environmental and stakeholder impacts.

5.1 Consistency

The policy seeks to further the objectives of the State Government goals and strategies contained in the South Australia's Strategic Plan and is consistent with the objectives of that Strategy.

South Australia's Strategic Plan is organised around six objectives and over the next 10 years aims to reach 84 measurable targets.

Aquaculture Policies under the *Aquaculture Act 2001* provide the necessary policy framework to facilitate aquaculture development in South Australia. The new and developing aquaculture industry is greatly assisting economic and regional development and will help meet the following Strategic Plan targets:-

Jobs (T1.1), economic growth (T1.5), exports (T1.12), regional population levels (T5.8) and regional unemployment (T5.9).

The Strategic Plan was updated in 2007.

The policy was developed within the framework of key objectives established in the South Australian Government's Food Plan and Directions for Regional South Australia. Additionally, the policy is consistent with the provisions of the *Environment Protection Act 1993*, *Native Vegetation Act 1991*, *Harbors and Navigation Act 1993* and *Coast Protection Act 1972*.

The Planning Strategy for Regional South Australia, January 2003, contains a number of strategies relevant to the development of this policy. In particular, the Policy is consistent with strategies relating to diversifying primary production into new areas to replace or complement existing activities and the integrated and sustainable management of natural resources in a manner that maintains ecological processes.

Australia's Oceans Policy sets in place a framework for integrated and ecosystem-based planning and management for Australia's marine jurisdictions. It promotes ecologically sustainable development of the ocean resources and encourages internationally competitive marine industries, whilst ensuring the protection of marine biological diversity. The key tool is Regional Marine Planning i.e. planning based on large areas that are ecologically similar, and seeks to integrate the use, management and conservation of marine resources at the ecosystem level.

The Great Australian Bight Marine Park is a Commonwealth Marine Protected Area. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is used to manage the Commonwealth Marine Protected Area. By defining the IUCN (the World Conservation Union) category, this defines the level of protection and hence whether activities are controlled in the Park.

Marine Plans establish an overarching strategic planning framework to guide State and local government planners and natural resource managers in the development and use of the marine environment. Fundamental to these Marine Plans is an ecologically-based zoning model. Each of these zones is supported by goals and objectives.

Marine Parks (or Marine Protected Areas) protect an area by managing some or all of the human activities that take place within it. Marine Park Zoning plans are designed to achieve long-term conservation of the biodiversity within a marine park, whilst providing opportunities for ecologically sustainable use. The zoning plans for each Marine Park (of which 19 are proposed for South Australia) will feature a combination of zones and special purpose areas to manage activities and uses within marine parks. Aquaculture policies will be prepared having regard to Marine Plan and Marine Park objectives and boundaries. However, consultation between the Department for Environment and Heritage and PIRSA Aquaculture continues to ensure aquaculture, and the management arrangements in place ensuring ecologically sustainable development, are appropriately recognised within Marine Parks and Marine Plans.

The Policy has been prepared having regard to the *Natural Resource Management Act 2004* (NRM Act). The intent of this Act is to establish an integrated system of natural resource management that will assist in achieving sustainable natural resource management in South Australia. Both the

Aquaculture Act 2001 (and Policies prepared under it) and the NRM Act are underpinned by ecologically sustainable development principles and are intended to complement each other. Natural Resource Management Regional Plans are required to recognise best practice by an industry sector. The *Aquaculture Act 2001* and management policies established under it provide a very good basis for managing the industry against best practice.

The Policy was developed within the context of the *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2003* (the “Water Quality Policy”).

The Water Quality Policy established under the *Environment Protection Act 1993* came into operation on 1 October 2003. The principal object of this Policy is to achieve the sustainable management of waters by protecting or enhancing water quality while allowing economic and social development. In particular, the Water Quality Policy requires all reasonable and practicable measures to be taken to avoid the discharge or deposit of waste into any waters or onto a place from which it is reasonably likely waste will enter any waters. The Water Quality Policy prescribes water quality criteria that must not be contravened and prohibits the discharge or deposition of pollutants into any waters that results in:

- Loss of seagrass or other native aquatic vegetation; or
- Reduction in numbers of any native species of aquatic animal or insect; or
- Increase in numbers of any non-native species of aquatic animal or insect; or
- Reduction in numbers of aquatic organisms necessary to a healthy aquatic ecosystem; or
- Increase in algal or aquatic plant growth; or
- Water becoming toxic to vegetation on land; or
- Water becoming harmful or offensive to humans, livestock or native animals; or
- Increased turbidity or sediment levels.

The Objects of the *Environment Protection Act 1993* include the promotion of the principles of ecologically sustainable development and, in particular, to prevent, reduce, minimise and, where practicable, eliminate harm to the environment. Section 25 of the *Environment Protection Act 1993* imposes a “general environmental duty not [to] undertake an activity that pollutes, or might pollute, the environment unless ... all reasonable and practicable measures to prevent or minimise any resulting environmental harm [are taken]”. This duty is enforceable through environment protection orders. The *Environment Protection Act 1993* also provides that communities must be able to provide for their economic, social and physical well-being.

The *Environment Protection Act 1993* defines general offences relating to environmental harm and environmental nuisance. Environmental harm is “material environmental harm if...it consists of an environmental nuisance of a high impact or on a wide scale, it involves actual or potential harm to the

health or safety of human beings that is not trivial, or other actual or potential environmental harm (not being merely an environmental nuisance) that is not trivial or it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$5,000". Serious environmental harm is defined as "environmental harm which involves actual or potential harm to the health or safety of human beings that is of a high impact or on a wide scale or other actual or potential environmental harm (not being merely an environmental nuisance) that is of a high impact or on a wide scale, results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$50,000."

This Policy is consistent with the provisions of the Water Quality Policy and *Environment Protection Act 1993* in that it seeks to minimise or prevent harm to the environment associated with aquaculture.

South Australia's Food Plan was developed with the objective of increasing the food industry's contribution to the South Australian economy to \$15 billion by 2010. The Food Plan identifies eight strategies to accelerate the food industry's growth. This policy is aligned with strategies relating to market driven food exports, sustainable production and a committed government. Aquaculture Management Policies support the growth of the food industry – specifically the seafood industry – by allocating and managing marine tenure in which the industry can grow sustainably. In addition: the policy is consistent with the objectives of the South Australia Seafood Food Plan in that it seeks to consolidate existing industry and allow appropriate expansion in aquaculture production.

The South Australian Government's regional development policy, *Directions for Regional South Australia*, identifies a number of objectives for regional development. This policy is aligned with objectives relating to planning and infrastructure building, responsive government and economic generation.

The *Harbors and Navigation Act 1993* vests the seabed in the fee simple with the Minister responsible for administration of that Act. That is, section 15 (1) of the *Harbors and Navigation Act 1993* vests all adjacent and subjacent land in the Minister for Transport.

Adjacent land is land extending from the low water mark on the seashore or the edge of any navigable waterway or body of water to the nearest road or section boundary, or to a distance of fifty metres from high water mark (whichever is the lesser distance). Subjacent land is land underlying navigable waters within the jurisdiction.

Matters of title and jurisdiction related to the territorial sea adjacent to the State are further addressed in the *Coastal Waters (State Powers) Act 1980*, *Seas and Submerged Lands Act 1973* and *Coastal Waters (State Title) Act 1980* of the Commonwealth. Under the *Aquaculture Act 2001*, plans such as aquaculture policies can be prescribed in State waters. State waters being those waters adjacent the State and territorial sea, and other navigable waters declared as such by regulation.

Section 15 (4) of the *Harbors and Navigation Act 1993* provides that "the *Crown Lands Act 1929* does not apply to land vested in the Minister under this Act but the Crown may, with the concurrence of the Minister, exercise any

other power that it has to grant a lease or licence over its land in relation to land vested in the Minister under this Act.”

Part 6 of the *Aquaculture Act 2001* provides for the grant of aquaculture leases in “State waters or State waters and adjacent land within the meaning of the *Harbors and Navigation Act 1993*”. Section 20 of the *Aquaculture Act 2001* provides that the grant of aquaculture leases is subject to the concurrence of the Minister responsible for administration of the *Harbors and Navigation Act 1993*. The Policy is consistent with these provisions as they relate to the jurisdiction of the *Aquaculture Act 2001* and the requirement for concurrence.

The *Coast Protection Act 1972* establishes the Coast Protection Board. The Coast Protection Board has a number of functions including...’to protect the coast from erosion, damage, deterioration, pollution and misuse’. The Policy is consistent with the provisions of the *Coast Protection Act 1972* in that it seeks to protect the coast by minimising any risk of erosion, damage, deterioration, pollution and misuse of the resource, through appropriate siting of aquaculture zones and aquaculture exclusion zones, the specification of appropriate types and levels of aquaculture development and the encouragement for the development of suitably located and designed infrastructure.

The *Native Vegetation Act 1991* sets out objectives relating to native vegetation in South Australia. Objectives relevant to this policy include ‘the conservation of the native vegetation of the State in order to prevent further reduction of biological diversity and further degradation of the land and its soil and the limitation of the clearance of native vegetation to clearance in particular circumstances including circumstances in which the clearance will facilitate the management of other native vegetation or will facilitate the efficient use of land for primary production.’ This Policy is consistent with these objectives in that it seeks to minimise impacts on native vegetation through appropriate siting of aquaculture zones and aquaculture exclusion zones around sensitive habitats.

The *Aboriginal Heritage Act 1988* provides for the registration, protection and preservation of Aboriginal sites, objects and remains. It establishes the Aboriginal Heritage Committee to advise the Minister for Aboriginal Affairs and Reconciliation and represents the interests of Aboriginal people throughout the State in the protection and preservation of Aboriginal Heritage. The Act requires that no person may damage, disturb or interfere with an Aboriginal site, object or remains, whether registered or not, without an authorisation from the Minister.

The Doing it Right policy on Aboriginal affairs commits the Government to “partnership and transparency”, to ensuring that “decision making and priority setting is inclusive of Aboriginal views and opinion”.

It is vital to the wellbeing of Aboriginal community members that their traditional values and practices are respected and that their heritage interests are taken into account when aquaculture development and expansions are planned for a particular area.

PIRSA Aquaculture will facilitate the involvement of local Aboriginal representatives in its process for developing and amending aquaculture policy and zoning.

5.2 Development Act 1993

Relevant provisions of the Land Not Within A Council Area (Coastal Waters) Development Plan provide that aquaculture development should be undertaken in an 'ecologically sustainable way', in 'a manner which recognises the social and economic benefits to the community' and so as 'to conserve environmental quality, in particular water quality, and other aspects of the coastal environment including sea floor health, visual qualities, wilderness, ecosystems, and biodiversity'. Additionally, aquaculture should be undertaken 'in a manner which recognizes other users of marine and coastal areas and ensures a fair and equitable sharing of marine and coastal resources' and minimizes 'conflict between water and land based users', 'adverse impact on the visual amenity of the coastal environment and unspoilt views adjacent to the coast' and 'adverse impacts on sites of ecological, economic, cultural, heritage or scientific significance.' The Policy is consistent with these provisions in that it seeks to ensure the ecologically sustainable development of the aquaculture industry and recognise and respect other users of the marine resource.

This Policy has been developed contemporaneously with the Smoky Bay Plan Amendment Report that amended the Ceduna (DC) development plan (1 June 2006). This recognises that further development of the aquaculture industry is currently restricted by the lack of residential housing. The Ceduna (DC) Development Plan proposes an Aquaculture Park for focusing land based activities ancillary to aquaculture, land based waste management sites, appropriate traffic routes for moving boats to and from the ramp and an increase in the housing allotments.

Section 29 of the *Development Act 1993* enables the Minister for Urban Development and Planning to amend a development plan in accordance with an approved aquaculture policy under the *Aquaculture Act 2001*.

Accordingly, it is proposed that the following zones specified in the Aquaculture (Zones - Smoky Bay) Policy 2007 be incorporated into the Land Not Within A Council Area (Coastal Waters) Development Plan.

- Eyre Island intertidal aquaculture zone;
- Missiessy intertidal aquaculture zone;
- Saddle Peak intertidal aquaculture zone;
- Smoky Bay intertidal aquaculture zone;
- Vinya intertidal aquaculture zone; and
- Smoky Bay South subtidal aquaculture zone.
- Smoky Bay North subtidal aquaculture zone.

Any form of aquaculture development identified in an aquaculture zone policy under the *Aquaculture Act 2001* is assigned to Category 1 for the purposes of section 38 of the *Development Act 1993*. Category 1 development is exempt

from any form of public notification and consultation. Aquaculture is exempt from public comment under the *Development Act 1993*, as it is provided for under the *Aquaculture Act 2001* through the aquaculture licensing process.

The assignment of various forms of development to Category 1 does not extend to developments that involve, or are for the purposes of, any activity specified in Schedule 22, other than where the development is, in the opinion of the relevant authority, of a minor nature. These developments must, for the purposes of public notice and consultation, be treated as a Category 2 development.

Schedule 22 lists activities of major environmental significance. Schedule 22 includes aquaculture or fish farming being the propagation or rearing of marine, estuarine or fresh water fish or other marine or freshwater organisms, but not including:-

- (a) the propagation or rearing of molluscs or finfish in marine waters; or
- (b) the propagation or rearing of other marine or freshwater organisms in an operation resulting in the harvesting of less than 1 tonne of live fish or organisms per year.

The vast majority of development applications for marine aquaculture development fall within the Land Not Within A Council Area (Coastal Waters) Development Plan. The Development Assessment Commission determines these applications.

5.3 Subsequent Development Plan Amendments

The area affected by the Aquaculture (Zones - Smoky Bay) Policy 2007 falls within the Land Not Within A Council Area (Coastal Waters) Development Plan.

This Development Plan currently contains policies to guide aquaculture development (Objective 35 and Principles of Development Control 13, 17-19, 25, 26, 38 and 41). However, to provide more certainty in regard to appropriate locations for aquaculture development, specific aquaculture zones are proposed to be identified within the Development Plan that give effect to the Aquaculture (Zones - Smoky Bay) Policy 2007.

An amendment to the Development Plan may be undertaken, pursuant to Section 29 of the *Development Act 1993*, to give effect to Aquaculture Policies gazetted under the *Aquaculture Act 2001*.

As such, it is proposed to amend the Land Not Within A Council Area (Coastal Waters) Development Plan, subject to the approval of the Aquaculture (Zones - Smoky Bay) Policy 2007, by establishing two new aquaculture zones with associated Objectives and Principles of Development Control.

Specific details are as follows:-

5.3.1 Smoky Bay

1. Establish a new “Aquaculture (Smoky Bay) Zone” with the following Objective and Principle of Development (PDC):

“OBJECTIVES

- 1 The ecologically sustainable development of filter-feeding mollusc aquaculture.

PRINCIPLES OF DEVELOPMENT CONTROL

- 1 Development should be primarily in the form of intertidal and subtidal filter-feeding molluscs aquaculture and associated activities, incorporating a range of species such as cockles, oysters and scallops.

PROCEDURAL MATTERS

Public Notification

Categories of public notification are prescribed in schedule 9 of the *Development Regulations 1993*”.

Insert new zoning maps to delineate the extent of the Aquaculture (Smoky Bay) Zone (Figure 3). Note the precise co-ordinates of the zone are provided in Attachment C).

5.3.2 Smoky Bay Subtidal

Establish a new “Aquaculture (Smoky Bay Subtidal) Zone” with the following Objective and Principle of Development (PDC):

“OBJECTIVES

- 1 The ecologically sustainable development of mollusc aquaculture.

PRINCIPLES OF DEVELOPMENT CONTROL

- 1 Development should be primarily in the form of subtidal mollusc aquaculture and associated activities.

PROCEDURAL MATTERS

Public Notification

Categories of public notification are prescribed in schedule 9 of the *Development Regulations 1993*”.

Insert new zoning maps to delineate the extent of the Aquaculture (Smoky Bay Subtidal) Zone (Figure 3). Note the precise co-ordinates of the zone are provided in Attachment C)

6 MARINE RESOURCES IN THE AREA

6.1 Physical characteristics

The West coast of Eyre Peninsula has major sandy bays with smaller embayments and exposed headlands, peninsulas and islands. The cliffs are eroded calcarenite deposited as dunes and consolidated. Smoky Bay receives low wave energy creating sandy beaches, mud and sand flats, samphire flats and mangroves. There are several offshore islands adjacent to the area. The surrounding land is used for farming.

The Ceduna marine system is a relatively shallow environment consisting of a number of linked bays including Tourville, Denial, Murat, Bosanquet, Decres and Smoky Bay and is approximately 40 kilometres wide and 8 kilometres long. The mouth of the system opens to the south-west at a maximum depth of approximately 20 metres. Most of the system has a depth of less than 8 metres. Water exchange between the Ceduna system and the Great Australian Bight occurs through the Yalata and Waterwitch Channels and a number of smaller channels. Based on a tidal prism study of the region water flow is high with an exchange period of approximately one day (Petruševics 1995). Water exchange is tidally driven with a lesser wind influence.

The waters of the Ceduna region receive little fresh water input and experience high evaporation. Salinity is elevated at approximately 35-41 ppt and water temperature ranges between 12-25°C. Dissolved oxygen levels generally range between 7-9 mg l⁻¹ and pH is approximately 8 (Petruševics et al. 1998).

The area has a Mediterranean climate with hot, dry summers and cool, wet winters. Daily maximum temperatures range between 15° and 29° Celcius in the summer and between 6 and 17° Celcius during the winter. The average annual rainfall is three hundred and eighty millimetres (380 mm) (PB & SARDI 2003).

Data from the Bureau of Meteorology's Streaky Bay Station shows that frequent light to moderate south to south westerly winds prevail for most of the year, except in July when north to north westerly winds occur. Winds of over 30 knots occur 9% of the time from the west (PB & SARDI 2003).

The most frequently occurring waves in Smoky Bay are less than 1-1.5 metres. The maximum wave height is expected to be 3 metres. The maximum swell is estimated to be south westerly waves of up to 4 metres in height.

Smoky Bay is characterised by intertidal sand and mud flats, with mangroves and samphire flats. The subtidal area consists of sand and stands of *Heterozostera tasmanica* in waters that are generally less than ten metres deep. Inshore areas are characterised by bare sand, intermediate areas are characterised by mixed seagrass species including *Posidonia* and *Heterozostera* and offshore areas are characterised by extensive *Posidonia* meadows.

The water depth, tidal range, temperature and salinity are suitable for oyster growth in existing intertidal development areas. Pacific oysters grow best in salinities between 30 to 35 ppt and water temperatures of 15 to 18°Celsius.

The wave height data indicates that the region is suitable for intertidal and subtidal mollusc aquaculture structures.

Aquaculture sites require appropriate depth of water and good water flow. Aquaculture is best sited to avoid fishing sites, high amenity areas, navigation channels, moorings, and minimise disturbance to sensitive species and habitats.

There are two types of aquaculture zoning in Smoky Bay, intertidal and subtidal culture. Environmental monitoring reports indicate that changes to the benthic habitats directly under such structures are minimal. Subtidal aquaculture is regulated to ensure several metres separation between the benthic habitat and the floating structures that greatly limits any opportunity for environmental interaction with the benthos.

The farming of non-filter feeding molluscs is a relatively new venture and on going monitoring and continued research is needed to understand / predict its potential impacts on the benthos.

6.2 Current aquaculture in the area

The Smoky Bay area already supports 144.25ha of intertidal oyster production. No further intertidal development is allowed in this Policy. The intertidal oyster sites are clustered in five groups.

Along the northern side of the Bay are two clusters of development:

- A cluster near Smoky Bay township,
- Another cluster further northwest from the township towards Saddle Peak,

Along the southern side of the Bay, there are three clusters of development:

- There is a cluster half way along Eyre Island,
- A cluster at the southern end of Eyre Island, and
- A cluster near Cape Missiessy.

There are 40 hectares of subtidal oyster sites in the centre of Smoky Bay.

6.3 Intertidal Oysters

Pacific oysters (*Crassostrea gigas*) are grown intertidally in South Australian using several methods - traditional rack and rail systems, the unique South Australian BST longline system or hybrid systems that suit particular growing areas. PIRSA Aquaculture will not consider any further rack and rail systems over areas of seagrass.

The oyster racks hold bags of oysters and are subject to the tides, spending only part of the time under water, hence the term “intertidal”. Culturing systems differ between bays and have been developed to allow oysters the greatest access to food to ensure that the optimum meat to shell ratio is obtained.

Oysters are graded several times to minimise parasite and fouling settlement and maximise growth. South Australian oysters are sold in a range of sizes to meet customer demands. The growout time varies with size, but usually takes between 18 to 30 months.

6.4 Subtidal Oysters

Subtidal oyster development is now being considered to increase the value and production of the industry. Subtidal oyster growth can be faster than intertidal oyster growth. However, intertidally grown oysters have better meat to shell ratio and a longer shelf life.

Subtidal oysters are grown in plastic baskets suspended from long lines supported from large plastic buoys.

6.5 Food Availability

Oysters feed on microscopic organic particles including phytoplankton (Van den Enden 1994), detritus (Quayle 1988) and protozoa (Le Gall *et al.* 1997) and rely on natural production of these nutrients. Consequently, the maximum sustainable shellfish stocking density or carrying capacity of a region is determined by the natural productivity of adjacent waters. Natural production may be derived internally or imported from surrounding waters depending on the hydrodynamics of the water body.

A number of attempts have been made in Australia and internationally to determine the carrying capacity of waterways for shellfish production. These studies have been hampered by lack of knowledge of seasonal and size related changes in energy requirements of the shellfish, seasonal changes in the productivity and feeding habits of the shellfish and the hydrodynamics of many areas (Incze *et al.* 1981). Methodological, measurement and analytical problems have been encountered with the models used to determine carrying capacity (Raillard and Menesquen 1994) and research has been hampered by the lack of long term environmental data (Crawford *et al.* 1996).

In the absence of more refined carrying capacity data, the allocation of marine resources for aquaculture in South Australia is undertaken conservatively and continually reviewed (Bond 1991, 1992 and 1994, Wilson 1989). Difficulty in conditioning oysters in oyster farming areas has historically been addressed by translocation of animals to other suitable conditioning sites.

7 FACTORS CONSIDERED DURING PLANNING FOR AQUACULTURE DEVELOPMENT

There are a number of factors considered in planning for aquaculture development. These factors are discussed in the following section.

7.1 Infrastructure

The major hindrances to aquaculture development are often the lack of supporting land based infrastructure. During early stages of industry development, this may be evident as a lack of hatcheries or some other link in the production process. As the industry matures, more employment is created and pressure shifts to the provision of suitable housing for workers. Land based planning needs to consider the movement of large boats and trucks through town sites and plan for consolidation of aquaculture ancillary activities. Large boat ramps are also required in oyster farming areas to prevent congestion at the ramps. In Smoky Bay, some of these factors have affected the development of the industry. Many of these are well addressed in the recent Smoky Bay Plan Amendment Report that amended the Ceduna (DC) development plan. This report also addresses appropriate sites for waste

management, encourages responsible waste management practices and promotes recycling centres.

7.2 Environmental quality

The ability to culture high quality, healthy aquaculture products, which are safe for human consumption and suitable for market requirements, needs the best marine environmental conditions available. Substandard environmental conditions will impact the economics of a business through higher mortality rates, slower growth rates and more disease prone stock.

Substandard water quality may result from poor site selection either in terms of the species and technology requirements or the selection of areas where outside factors may impact.

Suitable aquaculture sites may be impacted by terrestrial pollution and nutrient input through poor land management practices leading to urban or agricultural runoff. With increasing levels of coastal development this is a significant risk to the aquaculture industry.

The NRM Act will play an overarching role in coordinating regional natural resource management (NRM) issues. These will be coordinated through the State NRM Council, and will be implemented by the regional NRM Groups. The NRM Act has jurisdiction to coastal waters of the State, and will address potential interactions of terrestrial resource and marine resource management issues.

7.3 Commercial and recreational fishing

The Policy has been developed utilising the available data on commercial and recreational fishing.

Current aquaculture usage in Smoky Bay consists largely of the intertidal culture of Pacific oysters. The current total intertidal farming area is 144.25 hectares. Farming is divided amongst five separate growing zones and a small holding zone. There are also two subtidal zones in the centre of the Bay. There are currently two subtidal mollusc aquaculture sites (oysters) in the south subtidal zone. The current total subtidal farming area is forty hectares (40 ha), all in the southern subtidal zone.

The Policy covers an area of fourteen thousand one hundred and fifty nine point four hectares (14,159.4 ha) and includes an increase of only 40 hectares of subtidal non-filter feeding mollusc aquaculture in the Smoky Bay North subtidal zone. There will be no additional intertidal area available, but an additional one hectares will be made available in each intertidal zone for research purposes only. The emergency zone is only for temporary use if there is a requirement to remove stock from the production leases inside Smoky Bay proper.

7.3.1 Fishery Summaries

There is no take of abalone or rock lobsters in the area of Smoky Bay covered by this Policy. The bay is closed to all netting activities. In this area of South Australia, the blue crab fishery is managed as part of the marine scale fishery. This impact statement, therefore, will concentrate on the marine scale and recreational fisheries.

7.3.2 Marine scale fishery

The sector has access to 29 species or groups of related teleosts, 4 types of crustaceans, 7 types of mollusc, polychaete annelids and all species of elasmobranchs except great white sharks. Statewide, scalefish are taken predominantly by nets, longlines and lines. The total annual commercial catch of fish in the marine scalefish fishery is approximately 5,000 tonnes. Access to the commercial marine scalefish fishery is limited to holders of a Marine Scalefish Fishery Licence. As of May 2005, 402 marine scalefish fishery licences had been issued, including 25 restricted marine scalefish fishery licences. Other management restrictions include closed seasons and size limits. In addition, Northern zone rock lobster licence holders have access to the marine scalefish fishery in Smoky Bay and of 69 licences issued in this fishery, 66 have full access to scalefish species, two have access for bait only and one licence has no access. Eight miscellaneous fishery licences have been issued; one licence is for Australian salmon (*Arripis truttacea*) only and the remaining seven are restricted to the take of beachworms, bloodworms and tubeworms.

The area covered by this Zone Policy is included in Marine Scalefish Block 9. Fishing activity in this sector in Smoky Bay includes line fishing for King George whiting, snapper and calamari. Capture of scallops (*Pectinidae*) by divers is also a common activity within Smoky Bay. The total catch of other species from Block 9 is moderate (over 37 tonnes) (PPK & SARDI, 2002). Marine scalefishers in this part of the state are also permitted to take blue crabs and sand crabs using various types of pots. Marine scalefishers may also take 5 gummy or school sharks per trip, as Coffin Bay is defined as an 'Internal Water of the State' under the Offshore Constitutional Settlement (OCS) arrangements for school and gummy shark made between the Commonwealth and South Australia in 2001. Fishing activity in this sector occurs diffusely; scalefish and scallops are targeted on sand patches between seagrass meadows and calamari is found in association with seagrass.

7.3.3 Recreational fisheries

Participation in recreational fisheries in South Australia is not controlled and approximately 24% of South Australia's population over 5 years of age and around 29% of households participated in recreational fishing at least once a year (Henry and Lyle 2003). Take by recreational fishers in South Australia is managed through controls on devices used, size limits, bag and boat limits, closed seasons and closed areas, including aquatic reserves.

Recreational fishing is important for the local community and tourism value of Smoky Bay. Beach, shore and jetty fishing are popular and target species include King George whiting, sand flathead, yelloweye mullet, Australian salmon, snapper, mulloway, snook, garfish, greenback flounder, blue swimmer crab, tommy rough, trevally, leatherjackets, yellowtail kingfish and southern calamari (Edyvane 1999).

7.3.4 Area-specific fishing impact

Commercial take of important marine scalefish species in Smoky Bay is shown in table 3 based on 2000/01 data:

Table 3: Commercial fishing catch in Smoky Bay

Species	Catch (tonnes)	Percent of State Total Catch (%)
King George whiting	94	21
Calamari	17	3.5
Snapper	7.5	1.3
Other species	37	1.7

Areas of significance to the local community are included in the exclusion zone, together with a buffer exclusion zone around the Nuyts Archipelago Conservation Park. These areas will not be subject to any aquaculture development.

Aquaculture developments may affect recreational or commercial fishers through physical displacement. The current level of spatial data on the marine scalefish fishery, does not allow resolution of patterns of catch within fishing blocks. Potential impacts can be assessed only on a case-by-case basis as the impact is highly dependent on the location of individual farms. Issues of use relating to specific developments will be assessed and considered during the licensing process.

7.4 Navigation

The waters off Eyre Peninsula are used for recreational and commercial navigation. A major port is located at Thevenard, and there is a jetty and large boat ramp at Smoky Bay.

Aquaculture will be located to minimise impacts on navigational safety. Aquaculture sites must be marked for marine safety and navigation in accordance with the requirements of the Department of Transport, Energy and Infrastructure.

There are three shipwrecks south of Smoky Bay township. They are protected from aquaculture impacts as they are included in the aquaculture exclusion zone. There are known to be unlocated shipwrecks in the vicinity of Smoky Bay. Developers should consult with a Maritime Heritage Officer from the Heritage Branch of the Department for Environment and Heritage to identify possible shipwreck locations before submitting an aquaculture application.

The aquaculture developer needs to be aware that there is legislation that protects shipwrecks and that it is an offence to interfere with, disturb, damage, or dispose of an historic shipwreck or relic, punishable on conviction of a fine of up to \$50 000 or 5 years imprisonment.

Aquaculture developers are advised that a 550 metre radius buffer zone applies around the historic shipwreck, and that no aquaculture development should take place within this area, under the Land Not Within A Council Area (Coastal Waters) Development Plan (Planning SA 2003).

7.5 Tourism

There are opportunities for positive synergies between aquaculture and tourism. Tourism activities associated with the aquaculture sector, such as recreational fishing and farm tours, provide an additional source of income

and employment for regional economies with a well developed aquaculture sector. Good planning will reduce any potential for negative conflicts between aquaculture and tourism. To this end a buffer has been established along the main beach, jetty and boat ramp.

Tourism in the Eyre Peninsula Region generated in excess of \$200 million of local revenue from over 400,000 visitors in 2002 (SATC 2003). Major tourism events in the area include the Streaky Bay Snapper Fishing Competition and the Ceduna Oyster Fest. Tourism therefore provides a significant opportunity for broadening the economic base (District Council of Streaky Bay 2004). Coastal locations are important for satisfying visitors' demand for escape, relaxation, recreation, ecotourism and adventure.

South Australia's Seafood and Aquaculture Trail is a self-drive trail that promotes aquaculture related tourism products in the region. There are sixteen tours available on Eyre Peninsula between Whyalla and Ceduna.

7.6 Indigenous heritage

Smoky Bay is within the Far West Coast Native Title Claim (SAD6008/98). The Far West Coast Native Title Claim is made on behalf of the Wirangu, Mirning, Kokatha and other Anangu peoples with connection to the Far West Coast, who hold collectively all of the native title rights and interests, which exist in this area. The rocky coast north of Smoky Bay has sites of indigenous cultural significance. There are at least three areas of significance located in the area covered by the Smoky Bay policy. This includes a fishtrap in the bay adjacent to Willora and two areas of significance near Blacks Lagoon.

Applicants may wish to seek a Section 12 Determination under the *Aboriginal Heritage Act* to ensure their development does not damage or disturb an Aboriginal site that has restricted information access. Applicants are advised to contact the State Department of Aboriginal Affairs and Reconciliation, before submitting an aquaculture application.

7.7 Reserves and conservation areas

There are no marine reserves or marine parks in this area. The area around Laura Bay may be of particular interest to the marine parks program. There is an exclusion zone around Laura Bay depicted in the Aquaculture (Zones - Cape D'estrees) Policy 2006. Laura Bay Conservation Park and Laura Bay Conservation Reserve are located north of the policy area. Eyre Island is part of the Nuyts Archipelago Conservation Park, which is on the Register of the National Estate. It is undisturbed and contains mangroves and samphire flats.

The Great Australian Bight Marine Park approximately 250 kilometres to the west is declared under the EPBC Act.

7.8 Sensitive habitats

Smoky Bay consists of substantial areas of mangroves, samphire and wetlands. The bay has extensive mud flats. The benthic environment is up to ten metres in depth and consists of patches of seagrass and sand (Edyvane 1999). Ongoing research and environmental monitoring programs will monitor for any changes.

7.9 Protected species

The *National Parks and Wildlife Act 1972* provides the legislative framework dealing with native fauna in this State. Most native mammals, reptiles and birds are protected in South Australia. Under the provisions of the Act it is an offence to kill, hunt, catch, restrain, injure, molest or harass a protected animal. Schedules 7, 8 and 9 of the Act list rare, vulnerable and endangered species.

The *Fisheries Act 1982* deals with the killing, injuring etc a marine mammal. Under the provisions of Section 41A of the Act, a person must not kill, injure or molest, or cause or permit the killing, injuring or molestation of, a marine mammal. Under the provisions of Section 42 of the Act it is an offence to take white pointer shark (*Carcharodon carcharias*). A statutory defence exists in cases where the defendant proves that the alleged offence was not committed intentionally and did not result from any failure on the part of the defendant to take reasonable care to avoid the commission of the offence.

Syngnathid fishes are protected under the provisions of Section 42 of the *Fisheries Act 1982*. Syngnathid fishes are likely to be present, especially in the seagrass, algal and reef assemblages. It is known that at least some seahorses are abundant around finfish cages, using them as an alternative habitat to seagrass beds and algal assemblages. Thus it is likely that these species will not be adversely affected.

The EPBC Act addresses the protection of matters of national environmental significance. The Commonwealth Department of the Environment and Heritage's online database (www.ea.gov.au/epbc) list the following four groups of nationally listed species that may potentially occur in the region:

Seabirds, which may be adversely affected by activity around any feeding, roosting or nesting sites in the area.

Great white shark, which some fear may become entangled in mooring lines from subtidal mollusc culture units, although this has never occurred.

Marine mammals, including Australian Sea Lions, Blue Whale, Southern Right Whale and the Humpback Whale, which would have the potential to become entangled in nets or mooring lines. There have not been any reported entanglements of these species in shellfish culture systems in this State.

A number of terrestrial species that may be affected by land based access to aquaculture sites, however, it should be noted that any coastal development or user of the coastal environment could have this same potential for impact. Aquaculture, by definition, is no more or less likely to have these impacts, and applications for land based activities facilities undergo a complex ESD assessment that includes consideration of coastal protection.

Potentially up to 10,000 wader birds use Smoky Bay as a roosting site (Wilson 2000). This rivals the number of wader birds that utilize the Coorong, which is widely recognised as critical habitat for these birds (Wilson 2000).

The management of aquaculture in South Australia is designed to minimise any potential for impact on the above listed protected species. Aquaculture operators are bound by all environmental legislation including the *Coast Protection Act 1972*, *Environment Protection Act 1993*, the Water Quality Policy and other environmental plans and policies. The outcomes from the Aquaculture Advisory Committee subcommittee, the Marine Mammal-Marine Protected Area's Aquaculture Working Group, found that Australian Sea Lions face a very low risk of entanglement or entrapment with mollusc aquaculture structures.

Reporting of adverse interactions with wildlife is covered by *Aquaculture Regulations 2005*, which also requires that licence holders must submit an interaction Seabirds and Large Marine Vertebrates Avoidance Strategy for approval by the Minister.

7.10 Fisheries nursery and juvenile habitats

Concern has been expressed that aquaculture could affect commercially important fisheries (such as marine scalefish or prawns) either through direct impacts on the fishing grounds or indirect impacts on the fish population. It is argued that impacts on the fish population could result from effects on the habitat or food source of any life stage of the fish. The common species of commercial concern in this area are prawns and King George Whiting. Research in Fitzgerald Bay on adult fish assemblages, by Williams (2004), has suggested that fish farm structures have no detectable impact on the demersal fish assemblages.

The early life stages of fish and prawns involve larval stages where the prawns and fish live in the water column feeding on plankton. Larval prawns are filter feeders, feeding on organic detritus and plankton, for up to a month (Carrick and Ostendorf 2005). The food resources are naturally renewed and cultured filter feeding organisms such as oysters may be seen to compete for the limited food supply.

For prawns, these early life stages have a very low survival rate, with less than 1% surviving to two years (Tanner 2001). For aquaculture to have an effect on prawn populations, there would have to be an effect over and above the 99%+ natural mortality. This is extremely unlikely due to distance separation and segregation of trophic competition such that nutrient sources for the juvenile fisheries tend to be geographically distinct from the aquaculture areas.

Juvenile fish and prawns often spend part of their life cycle in inshore habitats including seagrasses and mangroves (Bryars 2004). Prawns for example may spend a year or more in the vicinity of seagrass habitat in their juvenile phase. However, they are generally found closer to mangroves (Skilleter *et al.* 2005). Aquaculture sites in the area are sited to avoid these sensitive areas.

Impacts of aquaculture are further limited by the limited scale of aquaculture compared to the available feeding habitat for these species. The Policy has a maximum aquaculture allocation of 244.25 hectares across an area of 14,159.4 hectares.

To prevent the potential for adverse impacts, allocation of aquaculture for filter feeding organisms is done conservatively. However, in Smoky Bay the zone policy maintains the existing level of filter feeding mollusc aquaculture.

8 AQUACULTURE ZONING

Development of intertidal farms in Smoky Bay is physically limited by the amount of water of the appropriate depth that is available. The intertidal zones are designed to allow adequate water flow between zones, to provide a suitable depth for the farms that maintains the oysters out of the water for the appropriate amount of time, and to avoid impacting shorebirds. Farmers are encouraged to approach their sites from the seaward side.

The subtidal area is also limited by the physical availability of area over five metres in depth. The subtidal zone is designed to include as much water volume as is possible, and the zone boundary follows closely along the five metre contour.

The Policy affects the waters from Little Eyre Island and Saddle Peak in the north to a few kilometres south of Cape Missiessy (Figure 1). Currently Smoky Bay has 144.25 hectares of intertidal oyster development and 40 hectares of subtidal oyster development. This policy maintains the level of development of the intertidal oyster industry, and increases the subtidal area by 40 hectares to a total of 80 ha split between two zones. Further development will be restricted to non-filter feeding molluscs only in the Smoky Bay North subtidal aquaculture zone.

Current oyster farmers in Smoky Bay have expressed concern that mussels can adversely affect nearby oyster farms through excess spat settling and fouling on oyster racks. Therefore, development of sites for mussels will not be considered in any of the zones.

The depth of each intertidal site is critical to the performance of the oysters. As intertidal sand flats are mobile, some flexibility must be maintained in the Policy to allow for site movement. Therefore, sites will be allowed to move, but not greater than 50% of the dimension parallel to the direction of movement of the sandbar, i.e. if a site is 200 metres wide, it may only move forward by a maximum of 100 metres. Additionally, any site movement must minimise disruption of water flow to other sites. All sites must therefore move in the same direction and by the same increment. This may only occur under direction from the Minister. For this reason all zones have been designed with a buffer area to allow site movement in the event of sand bar migration.

An aquaculture exclusion zone has been established to protect the visual amenity of area around the township, including the main beach and the jetty, Several recreational fishing sites are also included in the aquaculture exclusion zone, as are the small channels used by small craft for navigation purposes. Similarly, an aquaculture exclusion zone buffer of one kilometre is located around Eyre Island. There is one area where the Eyre Island intertidal aquaculture zone is less than this distance from Eyre Island due to the position of the associated sandbar. This area has current approvals and has been sited with the approval of the Department for Environment and Heritage, Coastal and Marine Conservation Branch.

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10 ATTACHMENT A – GLOSSARY OF TERMS

Adaptive Management Management involving active response to new information of the deliberate manipulation of fishing intensity or other aspects in order to learn something of their effects. Within a stock, several sub-stocks can be regarded as experimental units in which alternative strategies are applied.

Aquatic Reserve An area of water, or land and water, established as an aquatic reserve by proclamation under the *Fisheries Act 1982*.

Assimilative capacity The capacity of a natural body of water to receive wastewaters without deleterious effects to aquatic life.

Benthic Describes animals that live on, or near the substrate.

Biodiversity The variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part) and includes: (a) diversity within species; and (b) diversity of ecosystems.

Biomass The total weight or volume of individuals in a fish stock

Closures Prohibition of fishing during particular times or seasons (temporal closures) or in particular areas (spatial closures), or a combination of both.

Carrying capacity The maximum population of a given organism that a particular environment can sustain.

Ecologically sustainable development (ESD) Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

Ecosystem A dynamic complex of plant, animal, fungal, and micro-organism communities and the associated non-living environment interacting as an ecological unit.

Habitat The place or type of site in which an organism naturally occurs.

Harvest A productivity measuring technique

Infaua Aquatic organisms (usually animals, but sometimes algae) that live within particulate media such as sediments or soil.

Marine protected area (MPA) An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural resources, and managed through legal or other effective means.

Organic enrichment The supply of organic material (eg waste feed, faeces) to the seafloor.

Population A group of individuals of the same species, forming a breeding unit and sharing a habitat.

Spatial Of or relating to space.

Stakeholder An individual or a group with an interest in the conservation, management and use of a resource.

Stock A group of individuals of a species occupying a well defined spatial range independent of other groups of the same species, which can be regarded as an entity for management or assessment purposes.

11 ATTACHMENT B – LIST OF ACRONYMS

AAC	Aquaculture Advisory Council
ABARE	Australian Bureau of Agricultural and Resource Economics
Aq-CCEAD	Aquatic Consultative committee on Emergency Animal Diseases
CRC	Co-operative Research Centre
DAAR	Department for Aboriginal Affairs and Reconciliation
DAC	Development Assessment Commission
DEH	Department for Environment and Heritage
DNA	Deoxyribonucleic acid
DTEI	Department for Transport, Energy and Infrastructure
DWLBC	Department of Water, Land and Biodiversity Conservation
EMP	Environmental Monitoring Program
EPA	Environment Protection Authority
EPBC Act	The Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ERDB	Eyre Regional Development Board
ERDC	Environment, Resources and Development Committee
ESD	Ecological Sustainable Development
FAO	Food and Agriculture Organisation of the United Nations
FRDC	Fisheries Research and Development Corporation
ILUA	Indigenous Land Use Agreement
ISLW	Indian Springs Low Water
LGA	Local Government Association
MPA	Marine Protected Area
NATPLAN	National Marine Spill Contingency Plan
NPW Act	National Parks and Wildlife Act 1972
NRM	Natural Resource Management
NIMPCG	National Introduced Marine Pest Coordination Group
PAR	Plan Amendment Report
PIRSA	Department of Primary Industries and Resources, South Australia
RESA	Regional Environmental Sustainability Assessments

SA Water	South Australia Water
SARDI	South Australian Research and Development Institute
SATC	South Australian Tourism Commission
SMK	Sinclair Knight Menz
The Minister	Minister for Agriculture, Food and Fisheries
TAFE	Technical and Further Education

12 ATTACHMENT C - PROPOSED DEVELOPMENT PLAN AQUACULTURE ZONES

The **Aquaculture (Smoky Bay) Zone**, proposed to be included in the Land Not Within A Council Area (Coastal Waters) Development Plan, covers the following five aquaculture zones described in the Aquaculture (Zones—Smoky Bay) Policy 2007:

- The Eyre Island intertidal aquaculture zone;
- The Missiessy intertidal aquaculture zone;
- The Saddle Peak intertidal aquaculture zone;
- The Smoky Bay intertidal aquaculture zone; and
- The Vinya intertidal aquaculture zone.

The Aquaculture (Smoky Bay) Zone is comprised of the waters delineated by the following coordinates and shown on Figure 3.

Coordinates (GDA94)

Point	Latitude	Longitude
FA	32°21'39.96" South	133°51'26.14" East
FB	32°21'48.95" South	133°51'59.43" East
FC	32°22'13.19" South	133°52'07.59" East
FD	32°22'19.07" South	133°51'52.87" East
FE	32°22'06.28" South	133°51'40.08" East
FF	32°21'56.97" South	133°51'20.42" East

Coordinates (GDA94)

Point	Latitude	Longitude
DA	32°23'34.61" South	133°54'29.31" East
DB	32°23'35.34" South	133°54'13.51" East
DC	32°23'25.21" South	133°54'12.44" East
DD	32°23'26.31" South	133°53'58.37" East
DE	32°23'11.95" South	133°53'58.59" East
DF	32°22'54.65" South	133°54'03.59" East
DG	32°22'50.61" South	133°54'22.42" East
DH	32°22'51.72" South	133°54'35.62" East
DI	32°23'06.26" South	133°54'36.91" East

Coordinates (GDA94)

Point	Latitude	Longitude
HA	32°18'49.9" South	133°53'39.82" East
HB	32°18'58.2" South	133°53'31.64" East
HC	32°19'20.54" South	133°54'01.09" East
HD	32°19'42.89" South	133°54'16.06" East
HE	32°19'38.97" South	133°54'24.58" East

Coordinates (GDA94)

Point	Latitude	Longitude
GA	32°20'16.54" South	133°54'41.32" East
GB	32°20'16.68" South	133°54'28.03" East
GC	32°20'30.16" South	133°54'32.75" East
GD	32°20'42.83" South	133°54'45.4" East
GE	32°20'59.73" South	133°54'46.45" East
GF	32°21'12.61" South	133°55'02.05" East
GG	32°21'07.16" South	133°55'15.99" East

Coordinates (GDA94)

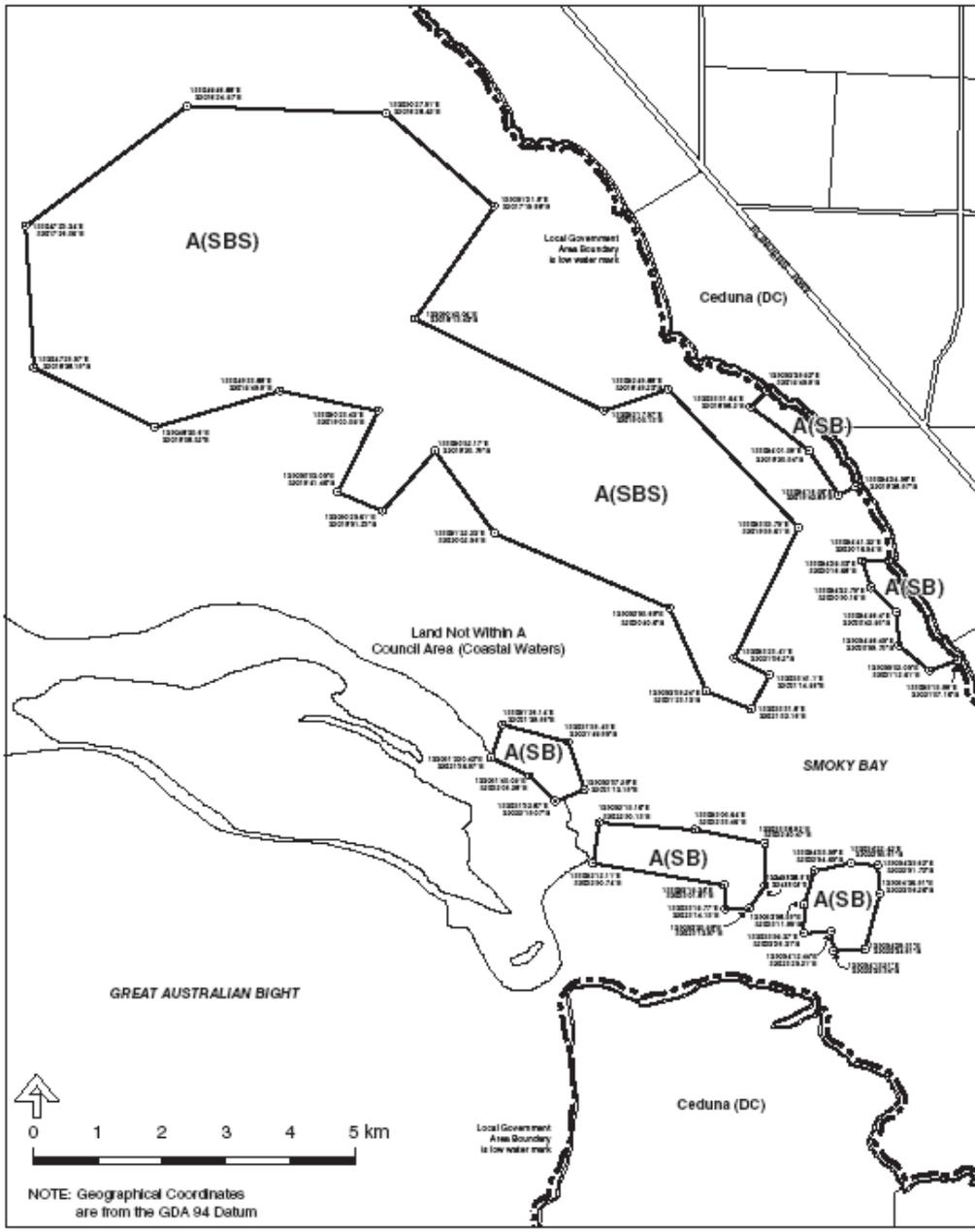
Point	Latitude	Longitude
EA	32°23'02" South	133°53'38.9" East
EB	32°23'13.97" South	133°53'30.89" East
EC	32°23'14.15" South	133°53'18.77" East
ED	32°23'01.81" South	133°53'18.34" East
EE	32°22'50.74" South	133°52'12.11"E
EF	32°22'30.13" South	133°52'15.16"E
EG	32°22'33.46" South	133°53'03.64" East
EH	32°22'40.47" South	133°53'38.92" East

The **Aquaculture (Smoky Bay Subtidal) Zone**, proposed to be included in the Land Not Within A Council Area (Coastal Waters) Development Plan, covers the Smoky Bay subtidal aquaculture zone as described in the Aquaculture (Zones—Smoky Bay) Policy 2007:

The Aquaculture (Smoky Bay Subtidal) Zone is comprised of the waters delineated by the following coordinates and shown on Figure 3.

Coordinates (GDA94)

Point	Latitude	Longitude
IA	32°17'15.88" South	133°51'21.9" East
IB	32°18'13.43" South	133°50'42.04" East
IC	32°19'00.13" South	133°52'17.57" East
ID	32°18'49.23" South	133°52'49.88" East
IE	32°19'59.61" South	133°53'55.75" East
IF	32°21'06.2" South	133°53'23.41" East
IG	32°21'14.86" South	133°53'41.1" East
IH	32°21'32.16" South	133°53'31.8" East
II	32°21'23.13" South	133°53'09.24" East
IJ	32°20'40.6" South	133°52'50.69" East
IK	32°20'02.56" South	133°51'22.23" East
IL	32°19'20.79" South	133°50'52.17" East
IM	32°19'51.25" South	133°50'25.61" East
IN	32°19'41.46" South	133°50'03.05" East
IO	32°19'00.08" South	133°50'23.43" East
IP	32°18'49.9" South	133°49'33.88" East
IQ	32°19'08.32" South	133°48'30.6" East
IR	32°18'38.19" South	133°47'29.57" East
IS	32°17'26.06" South	133°47'25.34" East
IT	32°16'24.87" South	133°48'46.88" East
IU	32°16'28.45" South	133°50'27.51" East



**LAND NOT WITHIN A COUNCIL AREA
(COASTAL WATERS)
SMOKY BAY
MAP LNWCA(CW)/1**

- A(SB) Aquaculture (Smoky Bay) Zone
- A(SBS) Aquaculture (Smoky Bay Subtidal) Zone
- Zone Boundary
- - - Development Plan Boundary

Figure 3 - Map LNWCA (SBAq)/1 – Land Not Within A Council Area – Smoky Bay Aquaculture.