The Sustainable Management of South Australian Aquaculture
PIRSA’s role

PIRSA Fisheries and Aquaculture (PIRSA F&A) administers the *Aquaculture Act 2001* (the Act), which is a unique and complex piece of legislation that is the first of its kind in Australia.

**The Act has the following objectives:**

- To promote ecologically sustainable development of marine and inland aquaculture
- To maximise the benefits to the community from the State’s aquaculture resources
- Otherwise to ensure the efficient and effective regulation of the aquaculture industry

**History**

The development of Aquaculture in South Australia has evolved over the last two decades to deliver nationally recognised high quality seafood products, environmental monitoring, aquatic animal health and legislative programs.

The first aquaculture management plans developed by the Department of Environment and Natural Resources and PIRSA during the 1990’s were the starting point for marine and land-based aquaculture development in South Australia.

The South Australian Environment Resources and Development Committee inquiry into aquaculture in 1998 recommended a revised management approach to improve this process, including the development of one-stop-shop process, higher level strategic spatial planning, greater environmental assessment and more extensive public consultation. The current model, encapsulated in the *Aquaculture Act 2001* and which was recently amended in 2012, ensures that the lessons learned over the years have been incorporated into the current aquaculture management framework.

South Australia’s aquaculture industry produces some of the most sought after seafood in the world including Southern Bluefin Tuna, Pacific Oysters, Yellowfin Kingfish and Abalone.
The ‘one-stop’ approach

In line with the recommendations made in 1998 by the South Australian Environment Resources and Development Committee inquiry into Aquaculture, the commencement of the Aquaculture Act in 2002 allowed PIRSA to focus the development of the legislative framework development around the concept of the “one-stop shop” approach.

This effectively created a single point of entry to State Government for the aquaculture industry. Various provisions of the Aquaculture Act require PIRSA Fisheries and Aquaculture to case manage and conduct referrals to various government agencies when developing zone policies and considering licence applications.

In addition, government agencies such as the Environment Protection Authority (EPA), the Department of Environment, Water and Natural Resources (DEWNR) and the Department of Transport, Energy and Infrastructure (DPTI) readily participate in PIRSA’s policy development, legislative review and through the Aquaculture Advisory Committee.

Incorporating key government agencies into PIRSA’s administrative processes as necessary allows a whole of government approach to industry development and regulation, and a simplified framework for industry liaison.


**Zone policy development**

In planning for the development of marine aquaculture in South Australia, PIRSA Fisheries and Aquaculture develops the State’s aquaculture zone policies in consultation with the industry, key state and local government agencies and wider community.

Aquaculture zone policies are statutory policies that dedicate or prioritise spatial areas of the marine environment for the purposes of aquaculture activity, which essentially includes:

- Species that may be farmed
- Areas where marine aquaculture cannot occur
- The type of aquaculture system that is allowed
- Limitations on biomass or leasable areas in a given location

Prior to developing zone policies, PIRSA F&A conducts desktop research of the available environmental, conservation, heritage, industrial/commercial and social data of each area to determine the spatial scope for aquaculture proposed zones.

Thereafter, an independent scientific technical investigation is undertaken which determines the environmental conditions and sustainable carrying capacity of the region identified. This includes:

- Benthic video analysis
- Water and sediment chemistry analysis
- Sediment in-fauna analysis
- Oceanography analysis
- Carrying capacity modelling

This provides the technical information necessary to determine the ecological appropriateness of proposed aquaculture zone areas for the zone policy. Once a zone policy is drafted by Parliamentary Counsel, it is referred to an independent Aquaculture Advisory Committee (AAC). Members of this statutory committee include PIRSA, the Environment Protection Authority (EPA), the Department of Planning, Transport and Infrastructure (DPTI), local government, industry and relevant conservation interests. If supported, the policy is then taken to both the relevant stakeholders and local public for consultation.

Community stakeholder comments received are addressed and incorporated in the policy which is again reviewed by the AAC, before being approved by the Minister for Agriculture, Food and Fisheries. Thereafter the Environment, Resources and Development Committee of the Parliament has the opportunity to comment on it. The final stage is gazetted by the Minister.
Community consultation

PIRSA Fisheries and Aquaculture has well established processes for consultation with relevant stakeholders to ensure that environmental, social and economic considerations are taken into account and addressed during both lease/licence and aquaculture zone developments.

Consultation processes are statutory obligations when considering both zone policy development processes and lease/licence assessments outside of zone policies under the Aquaculture Act 2001. PIRSA Fisheries and Aquaculture works in collaboration with other South Australian Government agencies to develop policy approaches on various environmental issues such as seagrass impacts and interactions between wildlife and aquaculture.

Memoranda of Administrative Agreements currently exist between PIRSA Fisheries and Aquaculture and the EPA and DEWNR to consolidate these collaborations.

As part of these administrative arrangements, input from these agencies is frequently sought by PIRSA Fisheries and Aquaculture, particularly during early stages of aquaculture policy zone development and when developing monitoring programs and assessment protocols for licence applications.

Members of the public are also provided with relevant details of proposed farming activity during all new licence application processes and are given the opportunity to provide submissions to PIRSA Fisheries and Aquaculture. These are considered and addressed prior to lease and licence approval.

A similar process applies to zone policy developments.

PIRSA Fisheries and Aquaculture have also developed a draft user guide for marine and land-based operators. The guide is developed for licence holders to ensure they know their regulatory and licence/lease requirements. User guides also include methods for environmental best practice and have been prepared in consultation with the EPA.
In South Australia, the assessment of individual aquaculture licence applications follows a strict set of guidelines. A semi-quantitative risk based assessment, based on a national best practice Ecological Sustainable Development assessment framework is applied to determine the sustainability of each individual application. The integrity of the assessment process rests on understanding of both the nature of the environment in which the intended aquaculture operation is practiced and the manner in which it interacts with or changes the environment that surrounds it.

As part of the assessment process, approximately 40 possible risk events considered to be directly relevant to potential aquaculture influences, are examined and this assessment is applied at both site and regional levels.

PIRSA Fisheries and Aquaculture also uses general guidelines to minimise environmental harm through the exclusion of aquaculture over areas of seagrass, reef and microalgae considered significant to local ecology.

Aquaculture activity is also excluded in buffer zones around areas of conservation and heritage significance such as seal colonies, aquatic reserves, shipwrecks and national parks. Under the Act, all new licences and any changes to conditions of existing licences must be referred to the Environment Protection Authority for consideration.

Annual Environmental Monitoring Programs (EMP) are required for all aquaculture licences. The level and type of monitoring varies for each sector (e.g. the requirement for water sampling or benthic videos) and are outlined in the Aquaculture Regulations 2005.

As EMP requirements are sector-specific they generally require the following annual information:

- Site development and productivity (all sectors)
- Feed and chemical inputs (all sectors)
- Water usage and discharge (land-based)
- Interactions with site infrastructure and marine vertebrates (all marine)
- Disease incidents (all sectors)
- Debris incidents (all marine)
- Waste and refuse disposal (all sectors)
- Benthic video assessment (finfish, mussel, abalone)

For some sectors, such as finfish and tuna, sediment sampling is also conducted by SARDI. This program involves sampling sediment adjacent to actively farmed sites and using DNA profiling to measure changes in the benthic community compared to established control sites.

PIRSA Fisheries and Aquaculture, the tuna and finfish industries and SARDI determine which sites are to be sampled each year. The same group also has responsibility for any follow up action that needs to occur as a consequence of poor environmental monitoring results. Monitoring of sediments in addition to data collected from EMP reports allows PIRSA Fisheries and Aquaculture to determine the overall environmental condition of the site.
To ensure compliance with lease/licence conditions and relevant legislation, PIRSA Fisheries and Aquaculture Environmental Officers are involved in the planning and execution of site audits together with Compliance Officers. The site audits cover each major sector on a bi-annual basis. Issues such as navigation, impacts to benthic habitats and discharge of water are among those investigated.

Land-based site visits may also be conducted as part of the initial assessment of an application, in response to public concern or as part of an audit program.
PIRSA’s aquatic animal health program aims to safeguard SA’s aquaculture, fisheries and natural resources from the impact of aquatic diseases to maintain their clean, green image. The program includes disease prevention, preparedness, response and recovery functions. These include:

- Developing aquatic animal health legislation, policies and guidelines.
- Planning and responding to disease emergencies, including fish kills.
- Managing the use of chemical treatments in aquaculture (in consultation with EPA).
- Biosecurity, disease surveillance and zoning.
- Meeting the State’s national and international disease reporting requirements.
- Managing disease risks associated with translocations (animal movement).
- Representing PIRSA at national committees and other national forums.
- Guiding the direction of scientific research on aquatic animal health.
- Building stakeholder and public awareness of aquatic animal health risks.

As an example, PIRSA have been working proactively with the South Australian Oyster Growers Association (SAOGA) to prevent and mitigate impacts of disease, with emphasis on Pacific Oyster Mortality Syndrome (POMS) which has devastated oyster growing industries elsewhere in Australia and the world. POMS has not been detected in South Australia to date, despite surveillance efforts. During 2012/13 South Australia led a national emergency disease response exercise to practice response strategies and identify improvements for policy and legislation. Outcomes included the development of a disease response plans for POMS, identification of alternate species culture (e.g. Ostrea angasi), improvements to surveillance and early detection systems, disease risk assessments, review of translocation policies and development of an emergency lease policy.

The aquatic animal health program also closely works with other seafood sectors on a variety of disease management initiatives, including abalone, tuna, yellowtail kingfish and other finfish.

PIRSA also lead fish kill investigations and responses. During 2013 and 2014, PIRSA’s emergency response capabilities have been put to the test, with great success in responding to numerous fish kill reports. PIRSA investigate numerous fish kills each year, with the majority caused by natural events (e.g. warm water events, harmful algae blooms, dodge tides). PIRSA’s primary role for investigating fish kills is to:

1. Rule out aquatic notifiable diseases (seafood trade implications)
2. Determine any human health issues (risks to fishers and seafood trade implications)
3. Ensure obvious human impact causes (such as oil or chemical spills) are quickly dealt with to protect natural resources

PIRSA engage numerous other government departments (including DPTI, EPA and SA Health) and research groups in a coordinated structure to rapidly and effectively investigate fish kills to determine likely causes.
As part of its commitment to supporting industry growth and developing an adaptive resource management framework, PIRSA Fisheries and Aquaculture plays a key role in supporting a number of strategic research initiatives.

Many of these projects are led and conducted by the South Australian Research and Development Institute (SARDI), the research division of PIRSA which offers an integrated research and development (R&D) capability to sustainably create, nurture and grow aquaculture industries. SARDI and PIRSA Fisheries and Aquaculture work closely with the aquaculture sector to produce applied research outcomes and timely delivery. SARDI’s aquaculture research program is uniquely set up to provide support across the whole spectrum of industry research needs, including:

- Developing novel technologies, species and sites.
- Environmental assessment, monitoring and carrying capacity modelling.
- Improving spawning, and larval and juvenile rearing of stock.
- Developing improved and more cost-effective sustainable feeds.
- Providing advice and support on selective breeding programs and aligned molecular technologies.
- Enhancing algal production and systems to produce biomass for a diverse range of products.
- Addressing disease and pest issues, through support with chemical registration, monitoring and surveillance, evaluation of therapeutics and development of improved husbandry practices.
- Pre and post-harvest product safety and quality, including developing novel products and packaging.
- Trade and market access.

The outcomes of such initiatives are integrated into decision making processes such as those associated with aquaculture zoning, disease control, managing interactions with protected wildlife species and environmental management.

Another strategic research initiative is the Innovative Solutions for Aquaculture Planning and Management suite of projects (IS). Commenced in 2004, this program is a joint initiative between PIRSA F&A and the Fisheries Research and Development Corporation (FRDC) to fund research to foster the continued sustainable development of the South Australian aquaculture industry.

Stage 1 of IS involved a site or species focus. Projects included an environmental audit of marine aquaculture, spatial impacts and carrying capacity for finfish aquaculture, finfish parasites, seal interactions and the development of rapid environmental assessment and monitoring techniques. In addition, a communication and extension strategy was developed to disseminate project outcomes to industry.

The particular focus of the current and second stage of the IS program is to facilitate further economic growth of the aquaculture industry and to provide information to improve the management of aquaculture resources. Projects include oceanic and biological modelling of Spencer Gulf, biosecurity, new technologies and new species and improving programs for environmental monitoring.