

# **Aquaculture Research Advisory Committee**

## **Annual Report July 2010 to June 2011**

Professor Ian White (Chairperson)  
Ms Jo Pickles (Executive Officer)

NSW Primary Industries  
Port Stephens Fisheries Institute  
Taylors Beach NSW 2316



**Department of  
Primary Industries**

## CHAIRPERSON'S REPORT

The value of long-term, committed research in protecting and supporting aquaculture comes to the fore when emergencies, such as disease outbreaks, occur. This year we have seen at first hand the value of research and experience in underpinning quick and efficient responses to challenges in the oyster industry, not just in NSW but throughout oyster production areas in Australia. That rapid and decisive response would not have been possible but for the continued investment in research by the oyster industry, the NSW State Government and the Australian Government, through the Fisheries Research and Development Corporation, FRDC, and the Seafood Collaborative Research Centre, AS-CRC.

In NSW we are singularly fortunate to have key, committed farmers and a group of NSW Department of Primary Industries and university researchers dedicated to providing the knowledge and experience necessary to sustain the aquaculture industry. I would like to particularly mention the work of the Elizabeth Macarthur Agricultural Institute, EMAI. Their highly professional and dedicated efforts have been absolutely invaluable in the rapid identification of diseases and parasites and in the protection of the industry. This exemplifies the benefits that have flowed from the merger of NSW Fisheries with NSW Primary Industries. The benefits to aquaculture it has created in providing opportunities for farmers and fisheries scientists to draw on EMAI's broader expertise have been outstanding.

I want to specifically thank the efforts of ARAC members. The farmer members have been outstanding and tireless representatives of their industries, and at personal cost to themselves. I am also extremely grateful to NSW Primary Industries staff who have assisted and contributed to ARAC. Their professionalism, dedication, energy, commitment and organisational skills have been outstanding. I also want to thank the FRDC and the AS-CRC for their continued support for the NSW aquaculture industry. Finally I am extremely grateful to the Minister and NSW Primary Industries for their strategic initiatives in and support for aquaculture.

ARAC is committed to increasing the sustainability, profitability and growth of the aquaculture in NSW through applicable research. I have pleasure in presenting this report on activities of the NSW Aquaculture Research Advisory Committee.



Professor Ian White FTSE  
CHAIR ARAC

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*This report was compiled in July/August 2011*

## Preamble

This is the fifth Annual Report for the Aquaculture Research and Advisory Committee (ARAC). The Minister for Primary Industries approved the formation of the Aquaculture Research Advisory committee in October 2005 to provide advice on industry contributions and R&D expenditure for all aquaculture industries in NSW. Confirmation for ARAC's establishment was confirmed in 2006 after the completion of a NSW Government review of Boards and Committees. ARAC has replaced the Oyster Research Advisory Committee (ORAC) and the former Advisory Council on Aquaculture (ACoA).

ORAC was formally disbanded after its meeting in December 2005.

## **The Committee**

The Aquaculture Research Advisory Committee (ARAC) was established in October 2006 and held its inaugural meeting on 31 January 2007.

ARAC is a statutory committee that advises the Minister on the amount of contributions payable by the NSW aquaculture industries into trust accounts for aquaculture research and development and the expenditure of those trust funds. The NSW prawn aquaculture industry is not included as it pays research levies directly to the Commonwealth.

ARAC is established under Section 157 of the *Fisheries Management Act 1994*.

## **Terms of Reference**

- 1 Investigate and evaluate the requirement for aquaculture research and development in NSW, after consultation with NSW aquaculture industries and with reference to NSW, Australian and overseas experience, and whether funded by the Fisheries Research and Development Corporation or otherwise;
- 2 Revise as appropriate research and development plans for NSW aquaculture research and development and promote it to the wider research community;
- 3 Advise the appropriate NSW Fisheries Research Advisory bodies and the Fisheries Research and Development Corporation on NSW aquaculture research and development matters and priorities;
- 4 Advise the NSW Minister for Primary Industries on the level of funding from industry required for aquaculture research and development in NSW and on its expenditure.
- 5 Oversee the management of annual contributions for aquaculture research collected under Section 156 of the *Fisheries Management Act 1994*, and placed in separate trust accounts under Section 157 of the *Fisheries Management Act 1994*.
- 6 Report on a regular basis, including an Annual Report based on a financial year, to the NSW aquaculture industry, the NSW Minister for Primary Industries and NSW researchers on aquaculture research and development initiatives;
- 7 Facilitate the dissemination, adoption and commercialisation of the results of aquaculture research and development; and
- 8 Promote aquaculture research and development in NSW.

## Membership and Selection Process

The *Fisheries Management (Aquaculture) Regulations 1995*, schedule 2 provisions relating to members and procedure of committee, section 2, states:

- 1 The Minister may convene a selection committee (including representatives of the aquaculture industry) for the purpose of recommending persons for appointment as members of a committee.
- 2 The Chairperson of a committee is to be the member of the committee at the time of being appointed by the Minister as Chairperson.
- 3 Section 157 (7) of the Act requires the Minister to ensure that a majority of the members of the committee are representatives of the aquaculture industry.

Industry members of ARAC are appointed by the Minister through a competitive selection process from Aquaculture Permit holders who have submitted expressions of interest to join the committee. A selection committee is appointed, comprised of two representatives from the NSW Farmers Association, one representative from the Seafood CRC and the NSW Primary Industries (Fisheries Division). Industry members are selected on merit.

The Chairperson is appointed to the committee by the Minister.

To aid the committee with their function, NSW Primary Industries personnel attend meetings and undertake the role of facilitator and secretariat.

## Deputy Members

The *Fisheries Management (Aquaculture) Regulations 1995*, schedule 2 provisions relating to members and procedure of committee, section 3, states:

- 1 The Minister may, from time to time, appoint a person to be the deputy of a member, and at any time revoke any such appointment.

## Committee Members in 2010/11

Member	Representing	Date of Appointment	Expiry Date
Prof. Ian White	Independent Chair	Oct 2006	Oct 2012
Ms Milada Safarik	Industry	Oct 2009	Oct 2012
Mr Tony Troup	Industry	Oct 2006	Oct 2012
Mr Geoff Diemar	Industry	Oct 2006	Oct 2012
Mr Michael Wright	Industry	Oct 2009	Oct 2012
Mr Ewan McAsh	Industry	Oct 2009	Oct 2012
Mr Nick Arena	Industry	June 2008	June 2011

There are six members on ARAC, four lease-based (oyster) representatives and two land-based (non-oyster) representatives, which reflects the relative sizes of the industry sectors in NSW. All members of ARAC, including the independent Chairperson, are appointed for a term of three years.

Ms Ali Bowman (Director, Productivity and Food Security Research), Dr Geoff Allan (Research Leader, Aquaculture), Dr Wayne O'Connor (Senior Research Scientist), Mr Ian Lyall (Manager, Aquaculture), Mr Steve McOrrie (Policy Officer, Aquaculture) and Ms Jane Frances (Manager, Aquatic Biosecurity and Risk Management) from NSW Primary Industries sat as observers on the Committee for 2010/11. Ms Jo Pickles from NSW Primary Industries is the Executive Officer. Mr Phil Baker (NSW Food Authority) also sat as an observer.

### Meetings

Three meetings were held during the financial year 2010/11:

<b>Member</b>	<b>26 August 2010</b>	<b>25 November 2010 (tele-conference)</b>	<b>10 March 2011</b>
Prof. Ian White	✓	✘	✓
Mr Tony Troup	✓	✓	✓
Mr Geoff Diemar	✓	✘	✓
Mr Nick Arena	✘	✓	✓
Ms Milada Safarik	✘	✓	✓
Mr Michael Wright	✓	✓	✓
Mr Ewan McAsh	✓	✓	✓
<b>NSW Primary Industries</b>			
Ms Ali Bowman	✓	✓	✓
Dr Geoff Allan	✓	✓	✓
Mr Ian Lyall (or rep)	✓	✓	✓
Dr Wayne O'Connor	✓	✓	✓
Ms Jane Frances (or rep)	✓	✓	✓
Mr Phil Baker	✓	✓	✘
Ms Jo Pickles	✓	✓	✓

## **Declaration of Pecuniary Interests**

Schedule 2 of the *Fisheries Management (Aquaculture) Regulations 1995* sets out provisions relating to members and committee procedure. Clause 9, sub clause 1 of the state:

- a a member of a committee is required to disclose any direct or indirect pecuniary interest in a matter being considered or about to be considered at a meeting of the committee, and
- b a member whose interest appear to raise a conflict with the proper performance of the member's duties in relation to the consideration of the matter must as soon as possible after the relevant facts have come to member's knowledge, disclose the nature of the interest at a meeting of the committee.

No pecuniary interests were declared in this financial year.

## **Trust Accounts for the 2019/11 Financial Year**

### **Advice on Level of Contribution**

Section 156 of the *Fisheries Management Act 1994* states a permit holder is required to contribute to the cost of administration or research or to other industry costs. Under section 157(4) of the *Fisheries Management Act 1994* the Minister is to appoint a committee of persons to advise the Minister on the amount of contributions payable into any trust account. Research contributions made by the aquaculture community (excluding the prawn industry) are reported to the Minister by ARAC.

Research contributions from the oyster industry have been set at \$37.00/ha/year. The amount of research contributions billed for 2010/11 was \$110,002.25.

Research contributions from the non-oyster aquaculture industry have been set at \$28/ha/year or \$134 for a minimum of 5 ha/year. The amount of research contributions billed for 2010/11 was \$21,329.16.

The required annual contribution to the Fisheries Research Development Corporation is calculated at 0.25% average gross value of production (AGVP), based on three year rolling calculations. The contribution from the oyster industry for 2010/11 was \$92,405.61 (\$99,056.00 less the fee waiver of \$6,650.39). The contribution from the non-oyster aquaculture industry for 2010/11 was \$14,199.82 (\$15,345.00 less the fee waiver of \$1,145.18).



## Advice on Level of Expenditure

Section 156 of the *Fisheries Management Act 1994* states a permit holder is required to contribute to the cost of administration or research or to other industry costs. Under section 157(4) of the same Act the Minister is to appoint a committee of persons to advise the Minister on the expenditure of money in the trust account.

## Expenditure Purpose and Level

The allocated expenditures for the 2010/11 financial year are outlined below:

<b>ARAC REVENUE AND EXPENSES – 1 July 2010 to 30 June 2011</b>		
*Note: this is an accrual accounting report for WBS 116-1 (Oyster Research Levy)		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2010	\$22,628.79	
Research Contributions billed 01.07.2010 to 30.06.2011	\$110,002.25	
<b>Total Revenue</b>	<b>\$132,631.04</b>	
<b>Expenses:</b>		
Internal Transfer to Committee Account		\$4,790.94
Bad Debts		\$261.00
FRDC Contribution (reduced by fee waivers for research)		\$92,405.61
Fees – Energy Assessments (Bullock & Assoc)		\$588.00
Fees – contribution for laboratory analysis for POMS		\$6,000.00
<b>Total Expenses</b>		<b>\$104,045.55</b>
<b>Balance of Cost Centre as at 30.06.2011</b>	<b>\$28,585.49</b>	

<b>ARAC Committee expenses – 1 July 2010 to 30 June 2011</b>		
*Note: this is an accrual accounting report for WBS 2492-1		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2010	\$1,409.52	
Transferred from NSW Primary Industries funds	\$7,186.42	
<b>Total Revenue</b>	<b>\$8,595.94</b>	
<b>Operating Expenses:</b>		
Travel		\$3,700.13
Committee Fees		\$3,829.55
Consumables		\$1,066.26
<b>Total Expenditure</b>		<b>\$8,595.94</b>
<b>Balance of Cost Centre as at 30.06.2011</b>	<b>\$0.00</b>	

<b>ARAC REVENUE AND EXPENSES – 1 July 2010 to 30 June 2011</b>		
*Note: this is an accrual accounting report for WBS 119-1 (Aquaculture [non-oyster] Research Levy)		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2010:	\$38,557.75	
Research Contributions billed 01.07.2010 to 30.06.2011	\$21,329.16	
<b>Total Revenue</b>	<b>\$59,886.91</b>	
<b>Expenses:</b>		
Internal Transfer to Committee Account		\$2,395.48
Bad Debts		\$227.52
FRDC Contribution (reduced by fee waivers for research)		\$14,199.82
Fees - Energy Assessments (Bullock & Assoc)		\$1,372.00
Fees – Analysis of nutrients in aquaculture water		\$4,682.99
<b>Total Expenses</b>		<b>\$22,877.81</b>
<b>Balance of Cost Centre as at 30.06.2011</b>	<b>\$37,009.10</b>	

### Levy Collection

Billing is conducted on the financial year and permit holders have the option of paying in full by 30 September or by quarterly instalments at 30 September, 31 December, 31 March and 30 June of that year.

Money held in the NSW Primary Industries Crown Trust Account does not receive interest.

### Forward Budget

<b>ARAC REVENUE AND EXPENSES – 1 July 2011 to 30 June 2012</b>		
<b>(Oyster Research Levy)</b>		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2011	\$28,585.49	
Research Contributions billed 01.07.2011 to 30.06.2012	\$120,460.00	
<b>Total Estimated Revenue</b>	<b>\$149,045.49</b>	
<b>Expenses:</b>		
FRDC Contribution (estimate)		\$100,000.00
ARAC Committee Expenses (Internal transfer)		\$8,000.00
<b>Total Estimated Expenses</b>		<b>\$108,000.00</b>
<b>Estimated Balance as at 30.06.2012</b>	<b>\$41,045.49</b>	

<b>ARAC REVENUE AND EXPENSES – 1 July 2011 to 30 June 2012</b>		
<b>(Aquaculture [non-oyster] Research levy)</b>		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2011:	\$37,009.10	
Research Contributions billed 01.07.2011 to 30.06.2012	\$23,899.00	
<b>Total Estimated Revenue</b>	<b>\$60,908.10</b>	
<b>Expenses:</b>		
FRDC Contribution (estimate)		\$20,000.00
ARAC Committee Expenses (Internal transfer)		\$4,000.00
<b>Total Estimated Expenses</b>		<b>\$24,000.00</b>
<b>Estimated Balance as at 30.06.2012</b>	<b>\$36,908.10</b>	

<b>COMMITTEE REVENUE AND EXPENSES – 1 July 2011 to 30 June 2012</b>		
<b>Revenue:</b>	Credit	Debit
Balance carried forward 30.06.2010	\$0.00	
Internal transfers	\$12,000.00	
<b>Total Estimated Revenue</b>	<b>\$12,000.00</b>	
<b>Expenses:</b>		
Consumables		\$1,500.00
Travel		\$6,000.00
Committee fees		\$4,500.00
<b>Total Estimated Expenses</b>		<b>\$12,000.00</b>
<b>Estimated Balance as at 30.06.2012</b>	<b>\$0.00</b>	

### **Recommendation on Level of Contribution**

On 31 January 2007, the Committee agreed the oyster research levy should increase to \$35.00/ha/yr from \$29.00 as this amount was insufficient to maintain the contribution to FRDC at 0.25% of AGVP and operate ARAC. Letters were then written to lease-based farmers explaining the reasons for the increase. An amendment in the Regulation Review was prepared and approved to raise the levy to be in effect 2008/09. The Committee has agreed that levies be reviewed on an annual basis at the first meeting in the calendar year.

### **Aquaculture Permit Holders in NSW**

In NSW, aquaculture occurs in fresh, estuarine and marine waters. There are several classes of aquaculture permits that are issued for the different types of aquaculture, with some farms having more than one permit. Most forms of aquaculture include Intensive farming; when the species being grown is given specially prepared feeds and Extensive farming; when the natural ecosystem of the water provides feed for the species grown.

As at June 2011 there were 330 oyster farming permits and 164 non-oyster businesses that have 210 permits between them authorising extensive and intensive (leases), fishout, hatchery and intensive land based activities.

## List of Activities

- ARAC wrote to the NSW Food Authority about data gathered under the Shellfish Quality Assurance Program which is collected and archived by the NSW Food Authority. The NSW Food Authority responded to our request, advising the NSW Shellfish Program, agreed the release of data to councils and other relevant agencies could yield significant benefits to industry. The NSW Food Authority confirmed they can publish water results, however, shellfish results can be linked back through NSW Primary Industries including microbiological data and the NSW Food Authority will be conscious of this. The process to release data is a formal request to the NSW Food Authority who will then notify growers from the relevant area that they are releasing the data requested.
- ARAC is progressing with an oral history and photographic archive of the NSW Oyster Industry. In July 2010, Steve McOrrie prepared an invitation and registration form that was mailed to all oyster farmers in NSW seeking historical material. ARAC has created a register and collating this information as it comes in. It is hoped items such as photos, oral histories or equipment will be used to document the History of the NSW Oyster Industry. Around a dozen responses have slowly been trickling in. Steve will continue to encourage farmers to reply to the invitation and hopefully generate further interest at field days planned for 2011. NSW Primary Industries will have a scanner on site, to encourage farmers to bring photos on that day which can be scanned during the field day, but allows farmers to take them home again.
- Rebates on electricity and energy efficiency have been discussed over the past year. The increasing cost of electricity was nominated as a priority by several respondents to the ARAC survey of R&D priorities submitted late 2009. Farmers are also interested in the viability of solar power for their businesses and any rebates available. NSW Primary Industries worked with a consultant who conducted energy audits on a silver perch pond farm and a recirculation barramundi farm. In both audits, electricity costs were high and dominated (90%) by motors and air compressors. The aim was to explore the potential for expanding energy audits for NSW aquaculture farms. The consultant found few areas for efficiency savings apart from different fluorescent lighting in offices, a solar pump for a water reservoir and solar hot water. Potential improvements and savings were minimal with payback periods ranging from between 7.6 to 13.3 years. On the basis of these results, there appears little opportunity for this audit approach to significantly reduce costs for NSW aquaculture farmers.
- A representative from NSW Primary Industries' Aquatic Biosecurity and Risk Management team attend each ARAC meeting as an 'observer'. This has proven to be a valuable contribution to our meetings providing updates on aquatic biosecurity issues affecting the NSW aquaculture industry. Discussions included the Pacific Oyster Survey, Winter Mortality pilot study, processes underway to manage the unregulated ornamental fish industry, Nodavirus and that research is needed on wild populations of bass.

- Pacific Oyster Mortality Syndrome (POMS, OSHV-1) was confirmed in Sydney Harbour (Parramatta River) in early March 2011. This was in addition to the farmed triploid and wild Pacific oyster POMS event confirmed in the Georges River in December 2010. The Aquatic Consultative Committee for Emergency Animal Diseases endorsed a National Surveillance Plan to determine the extent to which POMS was occurring in Pacific oysters in NSW, SA and Tasmania in early February 2011. Field work was completed by Michael Dove, Brigid Krug, Steve McOrrie and Paul Schuettrumpf (a District Fisheries Officer based in Sydney and appointed as Operations Manager to POMS), with oyster farmers providing invaluable assistance and support. Lab analysis was conducted at EMAI for the samples collected (155 samples collected from each of 10 sites). The Federal Government and Australian Animal Health Laboratories subsidised laboratory costs with jurisdictions responsible for the cost of sample collection. The laboratory costs for the NSW component were estimated at \$64,200 with the national subsidy being capped at \$25,600 leaving a shortfall of \$38,600. ARAC were asked to contribute \$6,000 to assist with laboratory analysis for POMS. ARAC gave unanimous support to contribute \$6,000 from the Lease-Based Research Trust Account.
- ARAC members discussed the progression of industry development issues raised at the Joint Aquaculture Consultative Committee meeting held on May 2010 at the Sydney Fish Markets. Issues have been allocated to POAG, LBACG and ARAC to progress with I&I NSW and many of the items are underway.
- The oyster industry in upper Port Stephens (Karuah River) has experienced significant mortality and production is declining. The cause/s remain unexplained, but concerns have been raised over the potential impacts of mine effluent and leachate on oyster health. Geoff Diemar is working with Dr Wayne O'Connor and have approached Newcastle University researchers, with expertise in this field, to see if they would be willing to assist and what might be a path of action. ARAC has given 'in principle' support to investigate funding sources for this research and with the support of a number of agencies including the Great Lakes Council, it is planned to develop a full research application.
- Michael Wright raised the issue of norovirus testing and the closure of the Kalang River (the estuaries were closed by PCR testing). There is some question about what the test is testing, as virus particles detected by PCR may not be viable and hence, is the test 'fit for purpose'. The NSW Food Authority and the Office of Environment and Heritage are working with Belligen Council after major pollutants were identified with on-site sewage management systems (OSMS). Several government agencies are working with the Kalang River Working Group, but until water quality issues have been addressed the timeframe for reopening is unknown. The Kalang is an example of the importance of water quality issues and NSW Primary Industries, together with the NSW Food Authority and the Peak Oyster Advisory Group, have produced a guide for Councils/land use planners and oyster farmers on best practice called 'Healthy Estuaries for Healthy Oysters'. ARAC will keep apprised of any research related priorities for the Kalang.

- ARAC are supporting an investigation into the impact of oyster farming activities on seagrass communities in NSW. Information to date is anecdotal with many reports of positive impacts. However, it is likely that oyster farming activities in seagrass areas will require a more rigorous assessment under NSW State planning legislation. To assist the oyster industry to mitigate potential negative impacts of existing oyster farming activities on seagrasses, and to assist in the development of best practice for farming activities undertaken in seagrass areas, it is essential that independent research is encouraged that a) describes the impact of existing individual cultivation methods (e.g. longline, floating, tray etc.) on seagrass communities, and b) assists the development of oyster farming practices that reduce any demonstrated oyster farming impacts on seagrass communities. The Aquatic Ecosystems branch of NSW Primary Industries are designing the experiment which will also incorporate an assessment of the impact of removal of infrastructure on seagrasses.
- In August 2010, results of tests following oyster mortalities in the Macleay River indicated sulphide concentrations at levels that were sufficient to cause mortality. Sulphide is likely to have been the product of acid sulphate soil oxidation products mobilized following heavy rain. A working group including the Office of Environment and Heritage, NSW Primary Industries and Kempsey Council progressed investigations, sampling and monitoring. A report by a consultant to Kempsey Council (who is also preparing the Macleay Estuary Management Plan) will be ready in early 2012.
- Concerns were raised over the 'Draft Guidelines on the Application of General Principles of Food Hygiene to the Control of Viruses in Food' proposed by the Codex Committee on Food Hygiene. The major concern is the method of testing. The PCR test does not discriminate between infectious and non-infectious viruses – limiting PCR as an indicator. In spite of this, the draft guidelines impose many restrictions dependent on PCR results. SafeFish (a project funded by the Seafood CRC) have sent correspondence to the Codex Committee which included the feedback from the NSW Oyster Industry, NSW Food Authority and the Australian Shellfish Quality Assurance Program believing the document will prove restrictive to shellfish culture in NSW. Michael Wright noted that Codex have acknowledged that PCR does not discriminate between infectious and non-infectious viruses, however, labelling still seems to be an issue and the NSW Food Authority is concerned about the potential to be locked into a course of action in response to PCR positives. SafeFish have agreed to keep ARAC updated as to the outcomes of the Codex deliberations on the Standard.
- A funding request was submitted to ARAC, for the analysis of nutrients in aquaculture water, as a number of development applications are being delayed because there is a lack of information relating to nutrient levels. In November 2010, ARAC approved the request for \$5,000 for a testing program involving several farms to measure nitrogen, phosphorus and conductivity – the key variables Councils need information on when assessing applications. The analysis refers to those farms who don't have an EPA license and looked at a series of different classes of farms eg. intensive, extensive and recirc systems. The aim of this project was to provide data to assist Councils when assessing land-based aquaculture applications and should speed up the DA process.

- Kept informed of the Seafood CRC. The Seafood Cooperative Research Centre (CRC) is Australia's first entity to stimulate and provide comprehensive seafood-related R&D and industry leadership on a national basis. The Seafood CRC formed the Oyster Consortium to ensure the national oyster industry became a core participant in the Australian Seafood CRC. The Oyster Consortium consists of 6 representatives from NSW (currently including two members of ARAC), 6 from SA and 6 from Tas. The Consortium determines a national approach to R&D on edible oysters. Together the Consortium and the Seafood CRC determine what research and development proceeds. From here the Seafood CRC develops the program and decide the best institution/agency and project leader to conduct the research. The 'Shed Talks' held at Port Stephens and Batemans Bay (4 and 5 November 2010) arranged by the Oyster Consortium were very successful talking about some of the projects and issues supported by the Seafood CRC. Geoff Allan participated in the third year review of the Seafood CRC carried out in February 2011. The team provided five areas of improvement; two of these were how do we make sure the advances made by research are captured by industry and the other was articulating industry needs; genuine research needs, how research can address it and communicating this to research providers. A full report from the review panel will be available in late March.
- Ian Lyall advised of a proposed project to address the management of on-site sewage management systems (OSMS) in coastal NSW where there is potential for impact on oyster harvest areas. This was an action item arising from a State Aquaculture Steering Committee meeting held in November 2010. Local Government is responsible for approval and regular inspection of OSMS but not all Councils have properly functioning OSMS strategies in place. NSW Primary Industries would work together with the 19 Councils with responsibility for managing OSMS in oyster growing estuaries to a) have in place best practice OSMS management strategies that are fully implemented; b) engage in an active partnership with the local seafood industry and community to protect and improve estuarine water quality; and c) be aware of and use the newly developed guidelines Healthy Estuaries for Healthy Oysters.
- Ian Lyall and Tony Troup attended a strategy meeting on 16 November 2010 hosted by the Marine Adaptation Network (National Climate Change Adaptation Research Network for Marine Biodiversity and Resources) to scope stakeholder needs to respond to, prepare for, and manage the risks associated with climate change impacts on marine biodiversity and resource sectors. A report will be produced by the NCCARF and this will be forwarded to ARAC. Ian Lyall also advised information on climate change will be included in the review of the Oyster Strategy.
- Ray Tynan advised of a draft proposal to alter FRAB procedures. This follows a meeting in December 2010 where FRAB members endorsed preparing a detailed proposal to SIAC on industry taking on the responsibility of running the FRAB. Revised guidelines and procedures have now been drafted seeking comment from ARAC. ARAC discussed the proposal and noted among other things, there is a need to harmonise the meeting dates ie. FRAB, ARAC and other relevant bodies to be as effective as possible in the assessment and recommendation process.



- In 2010, the Committee made some minor changes to its priorities in the ‘ARAC R&D Strategic Plan 2007-2012’ ([www.dpi.nsw.gov.au/fisheries/aquaculture/publications/industry-development/arac-r\\_and\\_d-strategic-plan-2007-2012](http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/industry-development/ arac-r_and_d-strategic-plan-2007-2012)). In late 2011, we are looking forward to industry support in laying the platform for growth over the next five years, when a major review of the R&D Strategic Plan takes place to encompass 2012-2017.
- Continue to update the ARAC homepage on the Department’s website including the summary of discussions from previous meeting and contributing to the Aquaculture Update newsletter.

**Aquaculture Research and Development currently being undertaken by NSW Primary Industries**

For the most up-to-date information on oyster research and development currently being undertaken by NSW Primary Industries, please refer to its web site: [www.dpi.nsw.gov.au/research/areas/production-research/aquaculture](http://www.dpi.nsw.gov.au/research/areas/production-research/aquaculture). The web site contains non-technical summaries of all research projects, scientific outputs and final reports.

**Oyster Research and Development currently being undertaken in Australia**

1	Project Title	Australian Oyster Industry Benchmarking Program Development
	Principal Investigator	Shane Comiskey
	Time Frame	2009 – 2010
	Funding Sources	Seafood CRC (2009/701)
2	Project Title	Enhancing mollusc production in northern Vietnam and NSW
	Principal Investigator	Wayne O'Connor
	Time Frame	2007 – 2012
	Funding Sources	ACIAR (FIS/2010/100)
3	Project Title	Protecting and enhancing the Sydney rock oyster breeding program
	Principal Investigator	Wayne O'Connor
	Time Frame	2006 – 2010
	Funding Sources	NSW DPI, FRDC and Seafood CRC (2006/226)
4	Project Title	Enhancement of the Pacific oyster selective breeding program
	Principal Investigator	Mr Barry Ryan
	Time Frame	2006 – 2010
	Funding Sources	ASI, FRDC and Seafood CRC (2006/227)
5	Project Title	Paralytic shellfish poisoning – A molecular genetic probe for fast, accurate detection
	Principal Investigator	Dr Shauna Murray
	Time Frame	2009 – 2010
	Funding Sources	UNSW, USYD, UTAS, NSW DPI
6	Project Title	Differential accumulation of algal biotoxins within diploid and triploid Pacific oysters and Sydney rock oysters
	Principal Investigator	Dr Shauna Murray
	Time Frame	2011
	Funding Sources	UNSW, NSW DPI, ARC (LP1110516)
7	Project Title	Building Bivalve Production Capacity in Vietnam and Australia
	Principal Investigator	Dr Wayne O'Connor
	Time Frame	2007 – 2012
	Funding Sources	ACIAR
8	Project Title	PhD – Improving safety and marketability of Australian oysters in China
	Principal Investigator	Dr Cath McLeod
	Time Frame	2010 – 2011
	Funding Sources	Flinders University and Seafood CRC (2010/723)

9	Project Title	CRC Oyster Consortium – communication, extension and management of R&D results
	Principal Investigator	Rachel King
	Time Frame	2007 - 2010
	Funding Sources	Seafood CRC (2007/715)
10	Project Title	Develop the non-maxima pearl industry at the Abrolhos Islands ( <i>Pinctada imbricate/fucata</i> )
	Principal Investigator	Derek Cropp
	Time Frame	2007 – 2011
	Funding Sources	Latitude Fisheries Pty Ltd and FRDC (2007/216)
11	Project Title	Protecting the safety and quality of Australian oysters with integrated predictive tools
	Principal Investigator	Mark Tamplin
	Time Frame	2008 - 2009
	Funding Sources	UTAS and Seafood CRC (2007/719)
12	Project Title	Oyster Consortium members – group study tour to New Zealand
	Principal Investigator	Ian Duthie
	Time Frame	2010
	Funding Sources	Seafood CRC (Oyster Consortium) (2010/730)
13	Project Title	Using genomic information to understand and improve the quality of the Australian South Sea Pearl
	Principal Investigator	Degnan, B.
	Time Frame	2009-2014
	Funding Sources	UQ, ARC, Autore Pearling Pty Ltd, Pearl Oyster Propagators
14	Project Title	Linking genes with the phenotype – creation of a genetic linkage map for the silver-lipped pearl oyster <i>Pinctada maxima</i>
	Principal Investigator	Jerry, D.
	Time Frame	2008-2010
	Funding Sources	ARC, James Cook University, Atlas South Sea Pearl
15	Project Title	Climate change research: Can Sydney rock oysters adapt to chronic multigenerational exposure to ocean acidification and temperature?
	Principal Investigator	Laura Parker
	Time Frame	2010-2011
	Funding Sources	ARC

16	Project Title	Molluscan biomonitor for quantification and impact assessment of endocrine disrupting chemicals in marine ecosystems
	Principal Investigator	MacFarlane, G.
	Time Frame	2008-2011
	Funding Sources	ARC, The University of Newcastle, NSW DPI, Port Stephens Council, Hunter Water Corporation
17	Project Title	Incorporation of selection for reproductive condition, marketability and survival into a breeding strategy for Sydney rock oysters and Pacific oysters
	Principal Investigator	Graham Mair
	Time Frame	2009-2013
	Funding Sources	Seafood CRC (2009/743)
18	Project Title	Aquatic Animal Health Subprogram: development of diagnostic tests to assess the impact of Haplosporidium infections in pearl oysters
	Principal Investigator	Phillip Nicholls
	Time Frame	2006-2009
	Funding Source	Murdoch University and FRDC (2006/064)
19	Project Title	PhD supplementary funding – human enteric viruses in Australian bivalve molluscan shellfish (operating)
	Principal Investigator	Tom Ross
	Time Frame	2008-2010
	Funding Source	Seafood CRC (2008/741)
20	Project Title	Oyster over catch: cold shock treatment
	Principal Investigator	Bob Cox
	Time Frame	2010 – 2011
	Funding Sources	TORC and Seafood CRC (Oyster Consortium) (2010/734)
21	Project Title	Protecting the safety and quality of Australian oysters using predictive models integrated with ‘intelligent’ cold chain technologies
	Principal Investigator	Mark Tamplin
	Time Frame	2008 - 2011
	Funding Sources	UTAS and Seafood CRC (2008/700)
22	Project Title	Methodologies for the implementation of Micro Mobile Information Systems in the Cold Chain and the resulting implications of Time Temperatures
	Principal Investigator	Paul Turner
	Time Frame	2007 - 2010
	Funding Sources	UTAS and Seafood CRC (2008/734)

23	Project Title	Proactive control of oyster spat production by controlling microbiological contamination
	Principal Investigator	Mark Tamplin
	Time Frame	2008 - 2011
	Funding Sources	UTAS and Seafood CRC (2008/761)
24	Project Title	Quality, shelflife and value adding of Australian Oysters
	Principal Investigator	Tom Madigan
	Time Frame	2009 - 2012
	Funding Sources	Uni SA and Seafood CRC (2008/763)
25	Project Title	Impact of acid sulphate soils on the survival of adult Pacific oysters challenged by bacterial extracellular products
	Principal Investigator	James Harris
	Time Frame	2009
	Funding Sources	Flinders University and Seafood CRC (2009/764)
26	Project Title	Development of tools for the sustainable management of genetics in polyploid Pacific oysters, <i>Crassostrea gigas</i>
	Principal Investigator	Anthony Koutoulis
	Time Frame	2010
	Funding Sources	University of Tasmania and Seafood CRC (2010/724)
27	Project Title	A novel method for producing sterile male fish and shellfish
	Principal Investigator	Dr Kathy Schuller
	Time Frame	2010
	Funding Sources	Flinders University and Seafood CRC (2010/759)
28	Project Title	Aquatic Animal Health Subprogram: understanding and planning for the potential impacts of OHsV1 on the Australian Pacific oyster industry
	Principal Investigator	Dr Tom Lewis
	Time Frame	2011-2012
	Funding Sources	RDS Partners Pty Ltd and FRDC (2011/043)

## Aquaculture Research and Development currently being undertaken in Australia



### Australian Centre for International Agriculture Research (ACIAR)

Active and Pipeline ACIAR Aquaculture Projects. NB. All ACIAR-funded Projects have an Australian component with the Commissioned Organisation [responsible for administering the funds] being an Australian University or State or Commonwealth Government Department or other Statutory Organisation. *More information visit [www.ACIAR.gov.au](http://www.ACIAR.gov.au)*

Active projects	
FIS/2002/111	Culture, capture conflicts: sustaining fish production and livelihoods in Indonesian reservoirs
FIS/2005/169	Improving productivity and profitability of smallholder shrimp aquaculture and related agribusiness in Indonesia
FIS/2006/142	Developing new assessment and policy frameworks for Indonesia's marine fisheries
FIS/2007/124	Diversification of smallholder coastal aquaculture in Indonesia
FIS/2010/016	Application of aquaculture planning tools in Indonesia
SMAR/2008/021	Spiny lobster aquaculture development in Indonesia, Vietnam and Australia
FIS/2005/114	Building bivalve hatchery production capacity in Vietnam and Australia
FIS/2006/141	Improving feed sustainability for marine aquaculture in Vietnam and Australia
FIS/2009/046	Development of fish passage technology to increase fisheries production on floodplains in the lower Mekong and Murray-Darling River basins
FIS/2010/031	Fish supply and demand scenarios in the lower Mekong Basin
FIS/2005/108	Freshwater prawn aquaculture in the Pacific: improving culture stock quality and nutrition in Fiji
FIS/2006/138	Developing aquaculture-based livelihoods in the Pacific Islands region and tropical Australia
FIS/2006/172	Winged oyster pearl industry development in Tonga
FIS/2007/116	Improving resilience and adaptive capacity of fisheries-dependent communities in Solomon Islands
FIS/2008/023	Increasing production from inland aquaculture in Papua New Guinea
FIS/2010/017	Building mariculture capacity in Papua New Guinea
FIS/2003/059	Sea ranching and restocking sandfish ( <i>Holothuria scabra</i> ) in Asia-Pacific
FIS/2009/033	Preliminary assessment of the hand-line (banca) fisheries in the Philippines
FIS/2009/054	Refinement and application of Cage Aquaculture Decision Support Tool (CADS_Tool) for freshwater systems in the Philippines
Recently completed projects	
FIS/2002/074	Capacity development to monitor, analyse and report on Indonesian tuna fisheries
FIS/2002/077	Improved hatchery and growout technology for marine finfish in the Asia-Pacific region
FIS/2005/009	Technical capacity building and research support for the reconstruction of tsunami-affected brackishwater aquaculture ponds in Aceh

FIS/2005/078	Culture based fisheries development in Lao PDR
FIS/2005/137	Control of nodaviral disease in tropical marine finfish hatcheries: enhanced biosecurity through the application of contemporary biotechnology, epidemiology and pathobiology
FIS/2006/002	Aceh aquaculture rehabilitation project
FIS/2006/140	Achieving consistent spawning of captive yellowfin tuna ( <i>Thunnus albacares</i> ) broodstock at the Gondol Research Institute for Mariculture, Bali, Indonesia
FIS/2009/035	Determinants for White Spot Disease outbreaks in Indonesian smallholder shrimp ponds - a pilot study of locality factors, White Spot Syndrome genotype distributions and pond factors
FIS/2008/031	An assessment of the extent of genetic introgression in exotic culture stocks of tilapia in the Pacific
FIS/2009/061	Aquaculture and food security in Solomon Islands - Phase 1
FIS/2010/035	Asia-Pacific tropical sea cucumber aquaculture research symposium
FIS/2009/014	Preliminary assessment of invasive and exotic fish species in Papua New Guinea
FIS/2009/015	Impact, management and utilisation of invasive and exotic fish species in Papua New Guinea
Pipeline projects	
FIS/2009/059	Improved catch monitoring and stock analyses for pelagic fisheries in Indonesia
FIS/2010/097	Improved food and nutritional security through sustainable fish production in Timor-Leste
FIS/2010/101	Fish health mariculture
FIS/2009/047	Mekong fisheries analyses
FIS/2010/058	Strengthening resilience of fishery dependent communities in Laos and Cambodia
FIS/2010/095	Adaption to climate change in rice-fish systems in the Mekong delta
FIS/2010/100	Enhancing mollusc production in northern Vietnam and NSW
FIS/2011/008	Development of land-based lobster production systems in Vietnam and Australia
FIS/2011/013	Enhancement of culture based fisheries in Lao PDR
FIS/2009/057	Support of pearl industry recovery in Tonga
FIS/2009/063	Pacific Islands near-shore fisheries Management
FIS/2010/057	Aquaculture and food security in Solomon Islands - Phase II
FIS/2010/058	Scaling-up innovation in marine fisheries governance in Solomon Islands, Kiribati and Vanuatu
FIS/2010/096	Removing bottlenecks for Sea Cucumber in PICs
FIS/2010/098	Further development of aquaculture based livelihoods in the Pacific Islands region and tropical Australia
FIS/2010/054	Mariculture PNG
FIS/2010/042	Expansion and diversification of production and management systems for sea cucumbers in the Philippines and Northern Australia





Australian Research Council (ARC)

New and ongoing projects and fellowships of the Australian Research Council. *For more information visit [www.arc.gov.au](http://www.arc.gov.au)*

Project ID	Project Title
DP1110592	Stress transcriptomics: development of tests to reduce the incidence of summer mortality in abalone
DP1110695	Orientation in the pelagic environment: how do larval marine fish find their way home?
DP1114750	Can consistent individual differences in metabolic rate explain animal personality? Implications for fish and aquaculture in a warming climate
LP1110516	Differential accumulation of algal biotoxins within diploid and triploid Pacific Oysters and Sydney Rock Oysters
LE1110239	Small biological molecule tissue imaging mass spectrometry facility for Western Australia for spatial metabolomics and lipidomics
FT0991722	The resilience of marine ecosystems and fisheries to climate change: exploring adaptation strategies
FT0992310	Linkages between productivity and consistent behavioural traits in fish: implications for harvesting, climate impacts, and selective breeding for aquaculture
DP0985015	Catch me if you can: predator recognition and anti-predator behaviour in marine fishes
DP0987537	An Assessment of Social-Ecological Resilience in the Context of Marine Resource Management in Melanesia
DP0987892	Ecological consequences of hydrodynamic disturbances
DP0988818	Coastal cold core eddies of the East Australian Current and their fisheries potential
LP0989432	What drives recruitment variability in Snapper? Application of a novel theoretical and empirical approach to predict fluctuations in fisheries
LP0989676	Sensory strategies for protecting endangered sawfishes
DP0877742	Global climate change and the future for coral reef fishes
LP0884160	Fine-scale responses of freshwater fish to environmental flows in arid-zone rivers and wetlands
DP1110716	Changing perspective: using fish ear bones to counteract the shifting baseline syndrome
FT1010767	Using ancient fish ear bones to overcome the shifting baseline syndrome in freshwater fish populations
DP1093510	Ocean-reef interactions as drivers of continental shelf productivity in a changing climate
DP1094932	A mechanistic understanding of coral reef recovery
FS1010088	Resilience of Coral Reef Ecosystems to Climate Change

FL0992179	Adapting the sustainable exploitation of coral reef resources to provide for climate change
FT0990835	Enhancing coral reef resilience to climate change
LP0990568	Management of coastal lakes to minimise invasion
DI1010158	Climate change research: Can Sydney rock oysters adapt to chronic multigenerational exposure to ocean acidification and temperature?
DP0878499	Omega-3 fats in vegetable oils: Improving their benefits
DP0880358	Production of structured designer particles with high encapsulation capacities and efficiencies
DP0985995	The essence of being an animal: sponge allorecognition and the evolution of individuality
DP1093395	Investigations of Australian Hematodinium species (sp.): a dinoflagellate parasite damaging major crustacean fisheries in Australia and worldwide
DP1093444	More than mud: how will disruption of soft-sediments threaten coastal biodiversity?
DP1093570	Triggering the dormant capacity of fish to make omega 3 fatty acids
LE1010059	Dual frequency identification SONAR (DIDSON) facility for sampling benthic and pelagic fish populations
LP0882042	Reducing skeletal malformations in cultured marine fish using gene expression, improved nutrition and advanced system operation
LP0882235	Linking genes with the phenotype - creation of a genetic linkage map for the silver-lipped pearl oyster <i>Pinctada maxima</i> .
LP0883806	An investigation of the underlying mechanisms that control gender and fertility in the Moreton Bay Bug, <i>Thenus orientalis</i>
LP0883880	Improving vaccine performance through understanding host-pathogen interaction in yersiniosis
LP0883918	Molluscan Biomonitor for Quantification and Impact Assessment of Endocrine Disrupting Chemicals in Marine Ecosystems
LP0989830	Regulation of saxitoxin production in bacteria and algae
LP0990606	Optimising barramundi production through early prediction of thermal tolerance and growth
LP0990664	Towards closing the life cycle of marine sponges: benefits for public aquarium display and coral reef conservation.
LP1010069	Enzymatic synthesis, microencapsulation and biological evaluation of a new class of omega-3 derived functional food ingredients.
LP1010153	Linking fish recruitment and habitat use to ecosystem processes
LP1010367	Feeding and breeding: Rainfall effects on connectivity and fidelity of iconic coastal fishes
LP1020409	Restoration genetics of five endangered fish species from the Murray-Darling Basin

Fisheries Research and Development Corporation (FRDC)

The Fisheries Research and Development Corporation plans, invests in and manages fisheries research and development throughout Australia. It is a federal statutory authority jointly funded by the Australian Government and the fishing industry. *For more information visit:* [www.frdc.com.au](http://www.frdc.com.au)

Project ID	Project Title
2011/043	Aquatic Animal Health Subprogram: understanding and planning for the potential impacts of OHSV1 on the Australian Pacific oyster industry
2010/312	Ridley Aqua-feed Australian Prawn and Barramundi Conference
2010/218	Atlantic Salmon Aquaculture Subprogram: Hydrogen peroxide treatment of Atlantic salmon affected by AGD
2010/217	Atlantic Salmon Aquaculture Subprogram: Forecasting ocean temperatures for salmon at the farm site
2010/214	Investigating the development process of a large scale aquaculture farm incorporating Indigenous cultural considerations
2010/203	Atlantic Salmon Aquaculture Subprogram: oxygen regulation in Tasmanian Atlantic salmon
2010/201	Feasibility study for integrated multitrophic aquaculture in southern Australia
2010/063	Atlantic Salmon Aquaculture Subprogram: evaluation of approaches to improve sediment remediation (rate & function) under salmonid fish cages
2010/033	Atlantic Salmon Aquaculture Subprogram: characterisation of EST03G12 and elucidation of its role in Amoebic Gill Disease (AGD) severity
2010/032	Atlantic Salmon Aquaculture Subprogram: Tasmanian Aquabirnavirus vaccine development: Towards achieving pan-specific protection of cultured salmonids in Australia using multivalent vaccines
2009/328	Tactical Research Fund: Seafood Industry Partnerships in Schools – Program Pilot, Tasmania
2009/327	Tactical Research Fund: Working on Water – a careers promotion program for marine-based sectors
2009/324	People Development Program: Nuffield Scholarship for an Aquaculture and/or Fish producer
2009/315.03	People Development Program: Aquatic Animal Health Training Scheme – Marianne Douglas
2009/315	People Development Program: scholarship program for enhancing the skills of aquatic animal health professionals in Australia
2009/303	Australasian Aquaculture 2010 to 2014
2009/219	New and emerging Aquaculture Species Subprogram: review of FRDC investment policies and strategies and development of a management framework for new and emerging aquaculture research
2009/218	Atlantic Salmon Aquaculture Subprogram: ecological effects due to contamination of sediments with copper-based antifoulants – phase 2

2009/217	Capability audit and assessment for fisheries and aquaculture RD&E framework
2009/214	Sector Overview: National Fisheries and Aquaculture RD&E Framework
2009/208	Developing clam aquaculture in Australia: a feasibility study on culturing <i>Donax deltoids</i> and <i>Katelysia</i> sp on intertidal and subtidal leases in South Australia
2009/206	Development of octopus aquaculture
2009/085	Atlantic Salmon Subprogram: Mitigation of climate change effects on salmon broodstock: effects of estrogen therapy
2009/067	Tactical Research Fund: Nutrient and phytoplankton data from Storm Bay to support sustainable resource planning
2009/046	PIRSA Initiative II: carrying capacity of Spencer Gulf: hydrodynamic and biogeochemical measurement modelling and performance monitoring
2009/044	Aquatic Animal Health Subprogram: surveys of ornamental fish for pathogens of quarantine significance
2008/354	Tactical Research Fund: investigating the establishment of a national aquatic animal health industry reference group
2008/328.12	People Development Program: 2009 FRDC Visiting fellows program Prof Hugh Ferguson
2008/328.11	People Development Program: FRDC Visiting fellows program Dr Alyssa Joyce
2008/317	Aquatic Animal Health Subprogram: Intensive pathology training workshop for laboratory diagnosticians
2008/314.17	People Development Program: 2009 FRDC International travel bursary – Paul Hardy-Smith
2008/314.16	People Development Program: 2009 FRDC International travel bursary – Mark Oliver
2008/228	ASBTIA: Maintaining SBT High Health Status - understanding SBT parasites and investigating ways to mitigate their influence on SBT production
2008/227	ASBTIA: SBT Research Program - Coordination, facilitation and administration
2008/226	Tactical Response Fund: Salmon Aquaculture Subprogram: ecological effects due to contamination of sediments with copper-based antifoulants
2008/222	Rickettsia-like organism vaccine development for the salmonid aquaculture industry
2008/221	Atlantic Salmon Aquaculture Subprogram: whole genome selection to improve selection efficiency for AGD resistance
2008/218	Atlantic Salmon Aquaculture Subprogram: extension funding application – AGD Vaccine phase III
2008/217	Atlantic Salmon Sub Program: Effect of temperature on reproductive development of maiden and repeat spawning Atlantic salmon: understanding the basis for improved egg survival and quality
2008/202	Towards reliable hatchery-produced quality blue mussels: an integrated approach to optimising supply

2008/094	Primary Industries Standing Committee (PISC) and Research and Development Corporations National RD&E Framework
2008/041	Aquatic Animal Health Subprogram: Tools for investigation of the nodavirus carrier state in marine, euryhaline and freshwater fish and control of NNV through integrated management
2008/038	Improvements to Semi Intensive Floating Tank System to achieve commercial readiness in marine environments
2007/249	Market investigation of the impact of rock lobster aquaculture
2007/246	Tactical Research Fund: A review of the ecological impacts of selected antibiotics and antifoulants currently used in the Tasmanian salmonid farming industry and development of a research programme to evaluate the environmental impact of selected treatments
2007/230	Aquaculture Nutrition Subprogram: Technical review, project management and development services.
2007/228	Rock Lobster Propagation Subprogram: Facilitated development and coordination of research towards the commercial propagation of rock lobsters in Australia
2007/226	Aquatic Animal Health Subprogram: rapid strain identification of the bacterial fish pathogen <i>Streptococcus iniae</i> and development of an effective polyvalent vaccine for Australian barramundi
2007/225	Aquatic Animal Health Subprogram: Metazoan parasite survey of selected macro-inshore fish of southeastern Australia, including species of commercial importance
2007/216	Develop the non-maxima pearl industry at the Abrolhos Islands ( <i>Pinctada Imbricata/fucata</i> )
2007/010	Integration of socio economic sustainability criteria into a reporting framework for the Australian aquaculture industry
2007/006	Aquatic Animal Health Subprogram: Development of molecular diagnostic procedures for the detection and identification of herpes-like virus of abalone ( <i>Haliotis</i> spp.)
2006/245	Australian Farmed Barramundi Strategic Plan 2007-2012
2006/237	Consumer research to assist growth for Australian farmed prawns
2006/235	Rocklobster Propagation Subprogram: commercially viable production of temperate rocklobster ( <i>Jasus</i> spp.) puerulus from eggs
2006/217	Repositioning the Australian prawn farming industry for growth
2006/205	Genetic improvement of <i>P. monodon</i> – establishing commercial readiness
2006/078	Innovative Solutions for Aquaculture and Aquafin CRC: Development of rapid environmental assessment and monitoring techniques for application to finfish aquaculture in South Australia
2006/064	Aquatic Animal Health Subprogram: development of diagnostic tests to assess the impact of <i>Haplosporidium</i> infections in pearl oysters



Australian Seafood Cooperative Research Centre (Seafood CRC)

The Australian Seafood Cooperative Research Centre is Australia's first entity to stimulate and provide comprehensive seafood-related research and development and industry leadership on a national basis. *For more information visit: [www.seafoodcrc.com.au](http://www.seafoodcrc.com.au)*

Project ID	Project Title
2003/237	Development of quality index for Aus seafood's
2004/401	A market access guide for seafood exporters: international residues standards (To become 2008/906)
2005/029	Factors limiting the resilience and recovery of fishing abalone populations
2006/215	Southern Rocklobster industry research and development planning, implementation and extension
2006/220	Spatial management of southern rock lobster fisheries to improve yield, value and sustainability
2006/226	Protecting and enhancing the Sydney Rock oyster breeding program
2006/227	Enhancement of the Pacific Oyster selective breeding program
2007/310	Oyster Consortium Strategic Plan (2007 to 2014)
2007/224	Increasing the profitability of <i>Penaeus monodon</i> farms via the use of low water exchange, microbial floc production
2007/700	A critical evaluation of supply-chain temperature profiles to optimise food safety and quality of Australian oysters
2007/704	Assessment of new market opportunities and development of effective market penetration strategies for Australian Southern Rocklobster in the USA, Middle East & Europe
2007/706	Establish the technical and market data to assess the feasibility of live bivalve mollusc (Australian oysters) access in USA - STAGE 1
2007/707	Resolving larval rearing, juvenile development and productivity constraints for propagated Southern Bluefin Tuna. Improvements to the production of Yellowtail Kingfish and Mulloway.
2007/715	Oyster consortium - communication, extension and management of R&D results
2007/716	Passion for Prawns – benchmarking performance
2007/717	SBT Maturation and Sexing; develop and apply new technologies
2007/719	Protecting the safety & quality of Aust oysters with integrated predictive tools
2007/721.10	Seafood Services Australia Ltd and Australian SCRC Services Participants Agreement part 2
2008/700	PhD B1.14 - Protecting the safety and quality of Aust Oysters using predictive models integrated with "intelligent" cold chain technologies (Judith Fernandez)
2008/705	PDRS- Quantitative Genetics Scientist PD.02
2008/708	PDRS Seafood Processing Scientist PD.05
2008/709	PDRS Larval & Early Juvenile Marine Finfish Rearing Scientist PD.01 and PD.04

2008/710	PDRS "Benchmarking consumers" physical and mental availability for seafood products and brands in different buying situations PD.07
2008/711	Addressing key aquatic animal health issues limiting production of Australian YTK and hatchery reared SBT industries
2008/713	PhD B1.03 - Understanding penaeid prawn sex determination and developing monosex induction strategies for commercial application
2008/715	Australian abalone industry R&D planning, implementation and extension
2008/720	A community intervention approach to increasing seafood consumption.
2008/725	PDRS - SARDI 0.5 FTE Aquatic Animal Health Scientist PD.03
2008/729	PDRS - SARDI Shellfish Safety
2008/731	PhD: Development of a healthy high Australian-seafood diet that will be acceptable to women of child bearing age: The Australian Seafood Diet for Intergenerational Health
2008/733	Population genetic structure of Sea Cucumber (bech-de-mer) in Northern Australia
2008/734	PhD B1.01 - Methodologies for the implementation of Micro Mobile Information Systems in the Cold Chain and the resulting implications of Time Temperature logging for models of microbial growth (Top Up)
2008/736	PhD B2.01 Nutritional factors influencing the performances of yellowtail kingfish ( <i>Seriola lalandi</i> ) cultured at low temperatures
2008/737	PhD B2.02: An investigation of the microbiology and biotechnical properties leading to extended shelf-life in Goldband Snapper ( <i>Pristipomoides multidens</i> )
2008/738	PhD B2.03: Characterisation of selected fish processing co-products and development of novel integrated bioprocess for value-added food and non-food bioproducts
2008/739	PhD B2.04 Antiviral activity and resistance to Abalone Viral Ganglioneuritis
2008/739	PhD B2.04 Antiviral activity and resistance to Abalone Viral Ganglioneuritis - Operating
2008/740	PhD B2.05 Understanding and forecasting seafood suppliers and buyers behaviour trading at the Sydney Fish Market
2008/741	PhD B2.08 Human enteric viruses in Australian bivalve molluscan shellfish
2008/742	PhD B2.10 - Processing of Sea cucumber viscera for bioactive compounds
2008/744	PDRS - Seafood Productivity Engineer PD.06
2008/745	The advancement of reproductive development in Southern blue fin tuna using hormonal manipulations of kisspeptin, the gatekeepers of puberty
2008/749	PhD B2.06 - Using the mucosal antibody response to recombinant <i>Neoparamoeba perurans</i> attachment proteins to design an experimental vaccine for amoebic gill disease
2008/750	AGD vaccine phase III; Sea-based trials, vaccine refinement and commercialisation
2008/753	Oyster Consortium marketing projects investment meeting
2008/756	Increasing seedstock production of domesticated giant tiger prawns ( <i>Penaeus monodon</i> ) through improved male fertility
2008/757	Commercial production of all-female reproductively sterile triploid Giant Tiger prawns ( <i>Penaeus monodon</i> ): Assessing their commercial performance in ponds
2008/760.01	COMMUNAL Project Meeting Expenses

2008/761	PhD B3.01 Proactive Control of Oyster Spat Production by Controlling Microbiological Contamination (Top Up)
2008/762	PhD B3.03 The effect of temperature on reproductive development in maiden and repeat spawning farmed Atlantic Salmon: Understanding the molecular basis for improved egg quality and survival (Top up 2 years only )
2008/763	PhD B3.04 Quality, shelf life and value adding of Australian Oysters
2008/763.10	Quality, shelf life and value-adding of Australian Oysters (PhD Operating Expenses)
2008/764	APFA - R&D planning, implementation, extension and utilisation
2008/765	Higher Education Theme Leader
2008/768	PDRS Seafood Molecular Biologist PDRF: Seafood Innovation through molecular biology
2008/773	Scope of options to establish gamete cryobanking services to genetic improvement programs in Australian aquaculture industry
2008/775	A one day workshop to define oyster 'condition' and to review the techniques available for its assessment
2008/777	Australian Oyster Industry Supply Chain Analysis & Improvement Strategy
2008/778.01	Program 2 workshops (TBPs etc)
2008/779	COMMUNAL: Tracking seafood consumption and measuring consumer acceptance of innovation in the Australian seafood industry
2008/780	PhD: Determination and manipulation of reproductive status of the captive reared SBT ( <i>Thunnus maccoyii</i> ) SBT
2008/781	COMMUNAL: Australian Seafood Productivity Improvement Centre (ASPIC) plus 2009/769.01 \$150k
2008/791	Economic Evaluation for the Seafood CRC
2008/793.10	Optimising quality within domestic prawn value chains
2008/794.10	Retail Transformation: Identifying opportunities for creating consumer focused Australian Salmon value added products. (ChemCentre)
2008/794.20	Retail Transformation:-Repositioning Australian farmed Barramundi in the domestic market
2008/794.30	Retail Transformation: Identifying opportunities for creating consumer focused Australian Salmon value added products. (Curtin)
2008/796	Increasing seafood consumption in elderly people
2008/799	Seafood diagnostic capability map and strategy for increasing analytical capability
2008/902	Aquaculture Innovation Hub (2009/212)
2008/903	Understanding Yellowtail Kingfish (total project amount \$798,849)
2008/903.10	Understanding Yellowtail Kingfish
2008/903.30	Understanding Yellowtail Kingfish
2008/903.40	Understanding Yellowtail Kingfish
2008/905	Australian Seafood Compositional profiles portal
2008/906	Seafood Trade & market Access portal
2008/907	Participation in the Seafood Access Forum (SAF)
2008/910	Automation of WRL Processing
2008/911	Smart Australian Seafood Innovation (SASI)
2008/915	ABFA- R&D planning, implementation, extension and utilisation
2009/700	PhD B3.02 - Improvement of YTK fingerling production efficiency through



	food & feeding management.
2009/701	Australian Oyster Industry Benchmarking Program Development
2009/702	Seafood Success: Entrepreneurship and Innovation Program - SCRC Professional Diploma
2009/708	An abalone quality assurance program
2009/709	Improving the supply chain for selected WA finfish
2009/710	Bioeconomic evaluation of commercial scale stock enhancement in Abalone
2009/712	Future Harvest Theme Leadership
2009/714.10	Decision support tools for economic optimisation of invertebrate fisheries (Part 1 WRL component)
2009/722	Development and Evaluation of Yellowtail Kingfish Consumer Products (approved as part of larger concept approved by board for \$900k)
2009/722.10	Development and Evaluation of Yellowtail Kingfish Consumer Products (approved as part of larger concept approved by board for \$900k)
2009/723	Analysis of product differentiation opportunities for Australian wild caught Abalone in China (G2 Group)
2009/723.30	Analysis of product differentiation opportunities for Australian Wild Caught Abalone in China - Stage 2 (ACA component)
2009/723.40	Analysis of product differentiation opportunities for Australian Wild Caught Abalone in China - China Representative Office
2009/724	Genetic technologies to support a transformation to profitability & competitiveness in F merguensis and P Monodon
2009/725	PhD B4.01 Sustainable aquaculture development through effective policies(Mark Oliver, USC)
2009/726	Southern Bluefin Tuna Larval/Juvenile Rearing
2009/726.20	Southern Bluefin Tuna Larval/Juvenile Rearing
2009/727	PDRS: Supply Chain analysis increasing profitability in selected supply chains
2009/728	Sustainable feeds and Feed Management for Yellowtail Kingfish
2009/729	Australian edible oyster industry business plan
2009/733	PhD B4.03: Body buoyancy and distribution of fish larvae: Exploring the mechanism of mass mortality in post-larvae
2009/739	Compositional profiles of Australian Seafood - Strategic analysis and method development
2009/741	Visiting Expert: Scientist Dr Clive Talbot
2009/742	Farmed prawns in Brisbane and Sydney – a consumer study
2009/743	Incorporation of selection for reproductive condition marketability and survival in oyster breeding strategies
2009/744	Propagation and sea-based growout of sea cucumber stocks in the Northern Territory
2009/744.10	Propagation and sea-based growout of sea cucumber stocks in the Northern Territory
2009/747	Can they hear me?...Modern and innovative strategies to talk to the seafood industry about MISA/CRC research results
2009/749	Improvements in Yellowtail Kingfish larval and juvenile survival and quality
2009/749.10	Improvements in Yellowtail Kingfish larval and juvenile survival and quality
2009/749.20	Improvements in Yellowtail Kingfish larval and juvenile survival and quality

2009/749.30	Improvements in Yellowtail Kingfish larval and juvenile survival and quality
2009/752.10	Communal: Seafood Trade Expert Panel (STEP)
2009/756	PhD B5.01 – "Managing fisheries to maximise profits by understanding and reducing variable costs of fishing"
2009/757	PhD B5.02 – Profiling host-parasite dynamics of AGD using molecular DNA methods – application to vaccine development, selective breeding and offshore aquaculture
2009/759	Towards all female <i>P. monodon</i> populations using androgenic gland manipulations
2009/760	PhD B5.08 – Development of vision and first feeding behaviour of Southern Bluefin Tuna and Yellowtail Kingfish
2009/761	PhD B5.03 – The role of inbound Chinese tourists in promoting Australian food products in China
2009/762	PhD B5.04 – Assessing the costs and benefits of changing shot rotation practices in the Southern Rocklobster fishery
2009/763	SCRC Hons H3.1– Impact of commercial hatchery practices on the contribution of broodstock to offspring and genetic diversity in the Yellowtail Kingfish breeding program
2009/764	SCRC Hons H3.2 -Impact of acid sulphate soils on the survival of adult Pacific Oysters challenged by bacterial extracellular products
2009/765	SCRC Masters M3.1 -Nutritional genomics and its application in aquaculture
2009/766	SCRC Hons H3.4: Development of Near-Infra Red method to detect and control microbial spoilage
2009/769.01	Innovation Fund Program 2 (ASPIC)
2009/770	Retail Transformation Chilled Pre Packaged Seafood Category Development (CRC Syndicate Project)
2009/771	Business Plan for a Collaborative Seafood Processing Hub in South Australia
2009/773	WA Dried seafood products - a pilot study (Dried Seafood products for the Asian Market: A pilot Study)
2009/774	The Whole Prawn - Harvest strategy optimization and co-management for the Moreton Bay Trawl Fishery
2009/775	Prevention of "muddy" taints in farmed Barramundi
2009/776	SCRC Hons H4.1 Sustaining Australia's aquaculture competitiveness by developing technological advances in genetics: Discovery of functional genes for commercial traits.
2009/777	SCRC Hons H4.2 Australian Farmed Prawns:B2B and B2C: A gender comparison of perceptions of relationship marketing
2009/778	SCRC Hons H4.3 The effects of feeding alternative protein sources on the intestinal mucus layer and mucosal architecture in Yellowtail Kingfish
2009/779	SCRC Hons H4.5 Improved Yellowtail Kingfish Growth Response, Flesh Quality and PUFA content through Biorefinery Microalgae LC-PUFA Aqua-Feed Additives
2009/780	SCRC Hons H4.6 Effect of temperature and plant protein inclusion on the growth factor gene expression in Yellowtail Kingfish
2009/782	SCRC Hons H4.10 - Impact of fish oil replacement on the expression of antioxidant genes and genes involved in the synthesis of highly unsaturated omega-3 fatty acids in YTK liver and muscle tissue.

2009/783	SCRC Hons H4.14 Factors that impact on the export performance of small and medium sized Australian seafood producers
2009/787	The Whole Prawn - Prawn Market Access Defenders
2010/704	Maximising the value by minimising stress in Abalone - Optimising Harvesting strategies
2010/705	Evaluation of Bifilar coil sensors for Sodium Metabisulphite concentration
2010/706	Accelerated New Product Development
2010/707	Loss minimisation in farmed prawns through improvements in shelf-life and colour
2010/708	PDRS: International and Domestic Business
2010/714	Master Class :- The Future Harvest
2010/722	PhD 6.02 – Optimising prawn nutrition for growth performance under suboptimal conditions
2010/722.10	PhD 6.02 – Optimising prawn nutrition for growth performance under suboptimal conditions
2010/723	PhD 6.04 – Improving Safety and Marketability of Australian Oysters in China
2010/724	PhD 6.05 - Development of tools for the sustainable management of genetics in polyploid Pacific Oysters, <i>Crassostrea gigas</i>
2010/725	PhD 6.06 - Capturing and maintaining genetic variation when initiating selective breeding programs for aquaculture
2010/726	PhD 6.07 - Towards a female <i>P. monodon</i> populations using endocrine manipulations
2010/727	PhD 6.08 - Molecular assessment of spawning cues in temperate abalone
2010/728	PhD 6.10 Development and optimisation of anaesthetics for use in the abalone aquaculture industry
2010/730	SCRC IB: Oyster Consortium Members - group study tour to New Zealand
2010/731	Discovery and manipulation of <i>Neoparamoeba perurans</i> aquaporins as a means to treat amoebic gill disease (AGD)
2010/734	Oyster over catch: cold Shock Treatment
2010/736	Development of formulated diets for cultured abalone
2010/737	Marine Biotoxins and Market Access for Abalone
2010/738	Reducing inflammation in the elderly with a high seafood diet
2010/740	PDRS - Fisheries Economist
2010/741	Synopsis of AGD research to date and review/recommendation of future AGD related R&D directions including the development of a vaccine for AGD.
2010/744	The Whole Prawn (Stage 1) - Product Development Ideation
2010/745	ACPF R&D planning, implementation, extension and utilisation (a replacement for project 2008/748)
2010/749	Analysis of non monetary benefits and impacts of Seafood CRC Market Development Projects

2010/750	Improving hatchery production of Southern Bluefin Tuna larvae and juveniles
2010/753	Improving hatchery production of Yellowtail Kingfish larvae and juveniles
2010/756	SCRC Master M5.1 Change, Cooperation and Competitiveness in China: A Cluster Model for the Australian Abalone Industry
2010/758	SCRC Hons H6.2 WA seafood waste streams: Audit and identification of potential for utilization.
2010/759	SCRC Hons H6.3 A novel method for producing sterile male fish and shellfish
2010/762	SCRC RTG: Study tour of Norwegian salmonid selective breeding establishments and research institutes
2010/763	SCRC RTG: Research training at AAHL, Geelong Vihn Dang
2010/764	SCRC Health Behaviour Communication Project (translational research - IS&H Conference)
2010/765	SCRC Visting Expert and Master Classes - Dr Paw Dalgaard - SSSP and related food safety and quality software
2010/766	Policy shift to risk-based fisheries management - Phase 1 Proof of Concept
2010/767	Prevention and control of maturation to address multiple key abalone production constraints
2010/768	Broodstock and genetic management for SBT and YTK
2010/769	Master Class :- Stimulating Consumption of Australian Seafood
2010/772.01	Master Class :- Human resources and change Management : Port Lincoln
2010/774	Successful Sardines – post-harvest optimisation and new product development for human consumption
2010/775	New product development for low value, high volume species - WA Sardines
2010/779	The Seafood CRC skills audit and articulation into the National Seafood Industry Training Package
2010/785.01	Third Year review
2010/786	Australian Prawn Farmers Association (APFA) Executive redirection Challenge project
2011/700	PhD B7.05 - The relevance of Human Resource Practices (HRP) as a driver of aquaculture industry performance
2011/701	PhD: - Atlantic salmon gastrointestinal health and productivity
2011/702	PhD: - An investigation of pathogenic bacterial populations in Atlantic Salmon ( <i>Salmo salar L.</i> )
2011/704	Seafood CRC Participant sponsorship to 2011 National Seafood Industry Leadership Program
2011/705	SCRC RTG 1.4 – Fish immunology workshop, Wageningen University
2011/706	Australian Seafood CRC Processor's, Marketer's and Retailer's Magazine
2011/707	SCRC RTG1.5 – Physiology and aquaculture of pelagic workshop, Panama, Central America
2011/708	SCRC RTG1.6 – Research training, National Institute of Health Sciences, Japan
2011/709	SCRC IB1.1 – Fish Breeders Round Table Meeting, Norway
2011/710	SCRC IB1.2 – Study tour of Marine Harvest operations, Scotland

2011/712	SCRC Masters 1.3 – Strategic Planning practices used by Australian Wild Harvest Fisher
2011/713	SCRC RTG 1.3 - Shrimp pathology course: Disease diagnosis and control, University of Arizona, USA + visit to Shrimp Biotechnology Business Unit, Thailand
2011/714	Investigation of a Company Model for Australian Wild Abalone Trademark
2011/715.01	Planning & Reporting July 2011