Atlantic Salmon Aquaculture Subprogram: UTAS Experimental Aquaculture Facility: Obtaining expert international governance, design and operational advice for the Atlantic salmon partners

Final Report

Tom Lewis, Morag Anderson, Adam Main

Project No. 2012/228

April 2014

FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

TSGA

RDS Partners
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2012/228	**UTAS Experimental Aquaculture Facility: Obtaining expert international governance, design and operational advice for the Atlantic salmon partners**

PRINCIPAL INVESTIGATOR: Dr Tom Lewis
ADDRESS: RDS Partners Pty Ltd
4/29 Elizabeth St
Hobart TAS 7000
Telephone: 03 6231 9033 Fax: 03 6231 1419

OBJECTIVES:

1. Facilitate engagement of industry experts with EAF proponents to provide guidance regarding design, operation and governance of the EAF.
2. Capture knowledge and understanding of design, establishment and operation of similar facilities.
3. Incorporate captured knowledge and understanding into relevant EAF design, establishment, operation and governance considerations.

NON TECHNICAL SUMMARY:

OUTCOMES ACHIEVED TO DATE

The outcomes identified in the project application were all achieved (*viz*):

- increased understanding of design, operational, management and governance considerations of the EAF;
- costs savings related to the EAF design and establishment; and
- improved operational effectiveness and efficiency.

Additional outcomes were identified and achieved as the project progressed (*viz*):

- improved relationships and potential for enhanced knowledge transfer between international agencies and local researchers;
- improved relationships and potential for enhanced knowledge transfer between Tasmanian and New Zealand salmon farmers;
- strengthened relationships and understanding between the EAF stakeholders;
- enhanced knowledge transfer between EAF stakeholders;
- increased potential stakeholder return on investment through sharper focus on joint priorities for the EAF; and
- improved understanding of effective community stakeholder engagement strategies.

While the Australian salmon and shellfish aquaculture industries have international counterparts, there are specific local issues, notably warmer water temperatures and amoebic gill disease (AGD) requiring specific, local research attention. Given the maturity of the industry, the presence of both a university (the University of Tasmania) and the national research organisation (CSIRO) in Hobart, Tasmania is well-placed to develop an Experimental Aquaculture Facility (EAF) of international standing.

For several years there has been discussion regarding establishing an EAF in Hobart, Tasmania. It was envisaged that this would involve collaborative research amongst producers, researchers, regulators, feed suppliers and research and development corporations, amongst others.

Discussions in the planning stage highlighted the complexities of the project – from both a governance and design point of view. It was felt that understanding how others in the international realm may have dealt with similar complexities would be fruitful.

With this in mind, industry stakeholders identified candidates with appropriate experience and knowledge of similar collaborative research facilities. From this, three experts were identified and invited to attend a week long schedule of formal and informal meetings to encourage information sharing, particularly from an industry point of view.

The outputs from the early 2013 expert consultation informed the development of a workshop convened by the Seafood CRC Aquaculture Production Innovation Hub in February 2014 for industry members from across Australia and New Zealand to develop and progress their understanding of the ways that community perceptions of salmon aquaculture impact on profitability and production.

The 2013 expert consultation, coupled with the 2014 workshop, allowed industry members to focus and refine their needs for the EAF, including community engagement, so they could more effectively engage in the next step of discussions with the research institution, researchers and community stakeholders regarding design and focus of the facility and broader salmon farming operations.

Keywords: Salmon, oyster, research, design, operation, governance, facility, aquaculture, relationships, stakeholders, industry, producers, community, perceptions.

Outcomes

The outcomes identified in the project application were all achieved (*viz*):

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Acknowledgments

This report was funded by the Fisheries Research and Development Corporation (FRDC) as part of project number 2012/228 *Atlantic Salmon Aquaculture Subprogram: UTAS Experimental Aquaculture Facility: Obtaining expert international governance, design and operational advice for the Atlantic salmon partners.*

The FRDC is Australia's leading agency concerned with planning, investing in, and managing fisheries research, development and extension.

The FRDC is a statutory corporation founded in 1991 under the *Primary Industries and Energy Research and Development (PIERD) Act 1989*. It is responsible to the Minister for Agriculture Fisheries and Forestry.

The FRDC's mission is to maximise economic, environmental and social benefits for its stakeholders through effective investment and partnership in research, development and extension.

Assistance with logistics - Adam Main, TSGA; Heidi Hansen, Tassal; Linda Sams, Tassal

Stakeholder representatives for their input during the week of the visit - Simon Palmer (EAF Project Manager, UTas),Brad Evans (Saltas), Linda Sams (Tassal), Ian Duthie (Tasmanian Oyster Research Council - TORC), David Cahill (Huon Aquaculture), Dave Morehead (Huon Aquaculture), Rhys Hauler (Skretting), Justin O'Connor (Tassal), Ryan Wilkinson (Petuna Seafoods), Mick Hortle (Van Dieman Aquaculture), Nick Elliott (CSIRO).

Consulting experts for their time and input – Brian Kingzett (Vancouver Island University, Canada), Andrew Forsythe (National Institute of Water and Atmospheric Research, New Zealand), Leo Nankervis (Skretting Aquaculture Research Centre, Norway).

Hosting meetings at IMAS – Colin Buxton (UTas Institute of Marine and Antarctic Studies, Taroona).

Facility managers for hosting tours of their facilities – David Mitchell (Huon Aquaculture), James Rose and colleagues (Skretting), Doug Paveley (Tassal Ranelagh hatchery), Kerry Wells and Scott Parkinson (Shellfish Culture Ltd, Pipeclay Lagoon).

Participants at the February 2014 trans-Tasman Seafood CRC Aquaculture Production Innovation Hub workshop – Forty three Australian and New Zealand participants from the salmonid aquaculture sectors, industry peak bodies, government agencies, service providers and funding agencies.

Background

Background in the original application

This application was developed to support the Tasmanian Salmonid Growers Association (TSGA) in its discussions regarding the design, construction and operation of an Experimental Aquaculture Facility (EAF) in Tasmania.

Discussions and planning to date have involved: UTAS, CSIRO, Tassal, Huon Aquaculture, Petuna, Ridley's and Skretting -- all of whom are committed to designing a world leading facility.

The EAF is viewed as a key plank in the salmon industry's strategic research needs, summarised as:

- Evaluating fish performance including:
  - nutrition under health and environmental challenges;
  - triploid performance;
  - selective breeding.

- Researching major health challenges including:
  - AGD (amoebic gill disease) research and treatment;
  - SGS (summer growth syndrome) research and treatment.

- Extending the environmental research capability by enabling the evaluation of performance and impact scenarios at response scales, and under environmental conditions, that would not be possible with field assessments:
  - process studies / nutrient flux measurement;
  - environmental modelling (validation/ ground truthing);
  - ecological interactions (e.g. Integrated Multi-Trophic Aquaculture);
  - biofouling evaluation;
  - contaminant monitoring / evaluation (natural and other user inputs as well as farm originating outputs);
  - environmental interactions / Multiple Use Management; and
  - remediation response (including active management options).

- Climate change adaptation:
  - providing research capability that will underpin industry adaptation to impacts from a changing climate.

Updated background for this report

Industry

In 2009/10 Australian fisheries production was valued at $2.2 billion. Tasmania's salmonid aquaculture accounted for $362 million or almost 17% of total fisheries production (http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Fishing~182).

The salmon industry in Tasmania directly employs around 1,100 people with indirect employment about three times that.

Tasmania also has a vibrant oyster industry currently providing direct employment for over 300 people, who produce around 3.6 million dozen oysters each year, with an estimated 'farm gate' value of $21 million.

Other species commercially farmed in Tasmania include abalone, mussels and seahorses.

Potential for growth of industry and research applications

Aquaculture globally is expected to expand due to increased demand for non-wild caught fish. To compete effectively in the international market Australia needs, amongst other things, to "continue to invest in innovation and closely monitor and adopt/adapt technologies available in advanced aquaculture operations worldwide" (http://www.daff.gov.au/__data/assets/pdf_file/0016/1623211/fish.pdf - National Fishing and Aquaculture RD&E Strategy 2010, DAFF).

While the Australian salmon and shellfish aquaculture industries have international counterparts, there are specific local issues, notably warmer water temperatures and amoebic gill disease (AGD) requiring specific, local research attention. Given the maturity of the industry, the presence of both a university (the University of Tasmania) and the national research organisation (CSIRO) in Hobart, Tasmania is well-placed to develop an Experimental Aquaculture Facility (EAF) of international standing.

The EAF to date

In 2010, the University of Tasmania established the Institute of Marine and Antarctic Studies (IMAS ; formerly the Tasmanian Aquaculture and Fisheries Institute) to be:

> "*an internationally recognised centre of excellence for marine and Antarctic research and education, developing environmental understanding, and facilitating sustainable development for the benefit of Australia and the world*".

The University owns a site at Taroona (a suburb of Hobart), that currently houses the IMAS marine research laboratories and on which it is proposed the EAF will be built.

Drivers for this project

Given the number of players and the complexity in the development of the EAF, industry felt it was important to seek an informed, external perspective with regard to:

- research to be undertaken;
- infrastructure/buildings to accommodate those needs; and
- governance of the entity responsible for the research and infrastructure.

This project sought to meet as many of those needs as possible by bringing to Tasmania international experts with understanding of these types of facilities and allowing discussion of their experiences and learnings. Additionally, it gave industry representatives the opportunity to focus on these very particular questions in a cohesive, facilitated manner, focussed on providing maximum return for the investment in their time.

The opportunity to link to the Seafood CRC workshop in February 2014 provided additional and broader perspectives on potential stakeholders and communities of interest that may influence the establishment and operation of the EAF, and how these interests could inform the EAF development.

Need

The need for this project stems from the proponents' collective need to capture - from industry experts who have been involved in the design and operation of similar R&D facilities around the world - knowledge and understanding regarding technical, management and governance risks and opportunities.

Failure to capture this knowledge and understanding could lead to significantly increased design and establishment costs and or significantly reduced efficiency and effectiveness of the facility.

Objectives

Original objectives

1. Facilitate engagement of industry experts with EAF proponents to provide guidance regarding design, operation and governance of the EAF.
2. Capture knowledge and understanding of design, establishment and operation of similar facilities.
3. Incorporate captured knowledge and understanding into relevant EAF design, establishment, operation and governance considerations.

There were no changes to these objectives as this project progressed.

Methods

TSGA engaged RDS Partners (www.rdspartners.com.au) to facilitate and manage this project.

The key steps in the methodology were as follows.

1. Identify, engage and consult with appropriate experts

The three industry experts able to accept the invitation to provide input were:

- Leo Nankervis

  Senior Researcher,
  Skretting Aquaculture Research Centre,
  Stavanger, Norway

- Brian Kingzett

  Deep Bay Marine Field Station Manager,
  Center for Shellfish Research,
  Vancouver Island University,
  Vancouver Island, Canada

and

- Andrew Forsythe

  Chief Scientist, Aquaculture and Biotechnology,
  National Institute of Water and Atmospheric Research Ltd (NIWA),
  Auckland, New Zealand.

2. Plan and arrange travel and accommodation requirements

Travel and accommodation were arranged to meet the requirements of the individuals as well as the project.

3. Plan and facilitate industry meetings in Tasmania

The following meetings were organised.

Tues 29 Jan 2013:	Tours of Rookwood Hatchery; Skretting facility; the proposed EAF site and existing infrastructure (Taroona);
Wed 30 Jan 2013:	Meeting with industry representatives;
Thurs 31 Jan 2013:	Meeting with EAF stakeholders and User group;
Fri 1 Feb 2013:	Shellfish Culture hatchery, Clifton Beach

In addition to this schedule, separate opportunities were provided for each of the visiting experts to engage with industry representatives in more informal settings – travelling to and from venues, meals, longer breaks during the days, informal discussions over the weekend following the end of the formal visit.

4. Design and deliver an effective program to capture advice and thoughts regarding EAF design, operational and governance considerations

Prior to their arrival in Tasmania, all three experts provided CVs for distribution to industry participants and prepared short presentations, with emphasis on similar facilities they had worked in or on, for the meetings with industry participants.

The visiting experts were also provided with background documentation regarding the proposed Experimental Aquaculture Facility. The initial email invitation stated that we were seeking input:

> "*to provide advice as we enter the serious planning stages (design, operation, governance) for a large-scale aquaculture R&D facility (the Experimental Aquaculture Facility – EAF)*".

RDS Partners organised and confirmed participants for the Wednesday meeting with industry representatives. Tom Lewis and Morag Anderson attended and facilitated the meeting. Notes were taken and distributed to all participants that evening, prior to the meeting the following day with the wider EAF Project User Group (PUG).

Feedback was sought from meeting participants regarding the worth of bringing the experts to Tasmania. The questions are included in Appendix 3.

Reflections from the international experts were also sought upon their return to their home institutions. This is included in Appendix 4.

5. Support and facilitate a Seafood CRC Aquaculture Production Innovation Hub workshop for the trans-Tasman salmonid sector

This workshop was held in February 2014 and was designed to provide information and understanding to help the industry collectively to be better prepared to address community concerns and respond to developing issues both proactively and reactively.

RDS Partners organised and confirmed participants for the workshop with CRC representatives Jennifer Cobcroft and Catriona Macleod. Maree Fudge facilitated the meeting. Workshop notes were taken and distributed as part of the Seafood CRC Hub project.

Results/Discussion

1. Consultation with the visiting experts

Summary of consultation with the international experts

The following is a summary of verbal and written feedback provided by the international experts during and following their visit to Tasmania.

- The experts agreed that there were many benefits to be gained from the proposed research facility. However they also cautioned that there were areas of risk that needed particular attention.

- The need for the facility was not questioned. There are industry and region specific knowledge gaps with major commercial impact potential that can be addressed through research at the proposed facility.

- There were several areas of concern for the experts: the number of stakeholders, some site logistics, processes around governance and their impact on operation of the facility.

    - The number of stakeholders increases the breadth of potentially competing priorities. Managing the tension between these priorities is a very specific challenge for the management and operation of the proposed facility. Indeed recognising those differing priorities and integrating them is key.

    - Specifically, the university will be able to offer research contribution to 'aquaculture-environment' interactions. While industry's primary focus is production capacity and efficiency, industry must recognise that understanding these interactions underpins the welfare of the stock, as well as managing perceptions regarding the wholesomeness of the product and ultimately social licence to produce and sell the products. Ultimately the research at the facility should lead to "sustained and profitable growth of Tasmanian salmonid [and shellfish] farming".

    - It was emphasised that "*academic[s] must recognise that their research interests may need to be overwritten by commercial need*" and "*industry must recognise that the enduring elements of their value proposition will require some robust, long-term research*".

Specific production issues identified by the experts included:

- attracting and maintaining committed staff and management;
- maximising effective use from a small site;
- providing community access to the site;
- providing sufficient volumes of freshwater at the site; and

- allocating sufficient floorspace for shellfish hatchery research and phytoplankton and larval production.

Specific governance and budgeting issues identified by the experts included:

- determining appropriate governance processes, research direction and priorities;
- identifying the person or people to drive decision making processes;
- matching funding sources to facility design priorities;
- adopting an agreed dispute resolution process;
- involving a feed supplier in the development – this could potentially skew research away from major industry concerns such as AGD; the supplier is also seen to already have access to high level R&D facilities elsewhere;
- Determining the value on the use of the facility needs to be determined and set in some way, whether by a user pays system or credit to initial investors, so that the ongoing budget for maintenance, consumables, etc., can be managed; and
- Co-ordinating efficient usage of the facility to assure adequate return on investment.

Summary of feedback from Tasmanian stakeholders

Feedback on the value of this project to EAF stakeholders was received from representatives of the peak salmon growers' organisation (TSGA), three salmon aquaculture companies, the Tasmanian oyster growers' research organisation (TORC), and the UTAS Project Manager responsible for building the facility.

Reported specific benefits included:

- valuable information on the possible technical design of the facility, learning what works and doesn't in currently operating facilities (including water supply, filtration, tank numbers and sizing);
- clear identification of potential pitfalls;
- identification of issues and opportunities not previously considered;
- identification of potential governance issues (including access and space limitation) and suggestions to manage these; and
- identification of social inclusion/community interaction opportunities.

Reported general benefits included:

- increased industry awareness and consideration of the opportunities for this facility to be used to bolster industry social licence; and

- increased cross-sector industry awareness and consideration of research priorities, capacities and funding options.

Reported changes directly attributed to the experts' visit included:

- a scheduled visit by industry stakeholders to the NIWA facilities in New Zealand;
- strengthening of industry and research relationships;
- amended design of the planned production tank facility;
- increased opportunity for future collaboration on an unrelated project;
- facilitation of a clear industry position and approach to EAF design, governance and management discussions; and
- strengthened relationships between Tasmanian oyster and salmon growers.

2. Consultation at the Trans-Tasman workshop

Summary of discussions at the Seafood CRC Aquaculture Production Innovation Hub workshop for the trans-Tasman salmonid sector

During Day 1, the group considered the existing body of knowledge in relation to community perceptions of salmon aquaculture, drawing on reports from Australian, New Zealand and international research.

Presentations were made by trans-Tasman industry representatives and social science researchers. Participants identified a list of priority issues relevant to community engagement and social acceptability of salmon farming, then grouped these by issue type and allocated a ranking to the intensity of the issue.

The potential impact of these issues was discussed; with focus on how might they affect 'access' (to resources to support farming) and 'market' (product sales). Approaches for dealing with the issues were then considered.

At the beginning of Day 2, a PR consultant presented different approaches to communication and working with community perceptions, drawing on examples from the mining industry, and providing some tools for managing issues and engagement with different stakeholders.

Participants worked through engagement planning around a subset of priority issues, and shared personal examples of approaches used or experienced.

The group appreciated the value of including social acceptability in business management, as the fourth pillar beside economics, environmental responsibility and applied technologies as sustainable foundations of business.

The workshop established an informal learning network (community of practice) regarding best practice in fostering social acceptability. An overriding theme was the need to build long-term relationships with stakeholders, work together on pre-competitive issues, and to consider a range of engagement tools.

The final day of the workshop focussed on scenario-based communications planning, moving from a long-term engagement issue, through to approaches to managing a critical incident.

Feedback from Seafood CRC workshop participants

Participant feedback on the workshop was uniformly positive (all aspects of the workshop received a rating of 4/5 or 5/5 from >80% of respondents), with the general consensus being that the workshop was a positive step in helping build trans-Tasman industry capacity in understanding and responding to stakeholder perceptions of the industry. More detailed analysis of feedback will be provided by the workshop conveners in a separate report.

Benefits and adoption

The stakeholders identified several direct and immediate benefits of the international experts' visit, all of which will help increase the return on eventual investment in the EAF project.

Of particular import was the opportunity to discuss the design variables with experts having direct experience in this area. These discussions formed the basis for industry input to Project User Group meetings held during and subsequent to the expert's visit.

Aside from technical design considerations, benefits included identification of governance issues and potential solutions and social licence/community interaction opportunities. The project also helped build/strengthen relationships which, in turn, will facilitate immediate and longer-term knowledge transfer within the Tasmanian sector and between the sector and the visiting experts.

At the end of the trans-Tasman workshop, the group identified immediate (within 6 months) actions as follows:

1. New Zealand participants
    - Develop a Community Engagement and Social Licence strategy and report-back to the group on the draft (by webinar) in April (Aquaculture NZ and MPI).
    - Incorporate changes, based on studies discussed at the workshop, in current research to include approaches that will examine community attitudes to aquaculture (MPI and Aquaculture NZ).
    - Seek funding support for ongoing (post- June 2014) trans-Tasman activity (Aquaculture NZ, MPI).

2. Australian participants
    - Survey of participants on workshop content. Including a follow up on "What will participants apply 'back at work'?" (Hub and RDS Partners).
    - Send TSGA R&D Strategy to NZ participants (TSGA).
    - Follow-up webinar in 3 months (end April 2014) – teaching from Nicki Mazur and update what's happened since the workshop?, Did strategies work?, Share stories (Hub to facilitate).
    - Convene a second workshop in June 2014 – Spatial Planning. Hub to facilitate Seek funding support for ongoing (post- June 2014) trans-Tasman activity (Hub and TSGA)

In the longer term, the wider community in Tasmania will benefit from targeted research to support more efficient, less impactful aquaculture operations in the state. The research also has potential to be used internationally and will be of benefit to the wider Tasmanian community.

Further Development

The discussions and the relationships that have been strengthened and built through the course of this project have already informed and will continue to inform strategic industry decisions regarding the EAF. The relationships and associated knowledge transfer will continue to inform EAF-focussed research directions and delivery into the medium to longer term.

Planned outcomes

Outcomes

The outcomes identified in the project application were all achieved (*viz*):

- increased understanding of design, operational, management and governance considerations of the EAF;
- costs savings related to the EAF design and establishment; and
- improved operational effectiveness and efficiency.

Additional outcomes were identified and achieved as the project progressed (*viz*):

- improved relationships and potential for enhanced knowledge transfer between international agencies and local researchers;
- improved relationships and potential for enhanced knowledge transfer between Tasmanian and New Zealand salmon farmers;

- strengthened relationships and understanding between the EAF stakeholders;
- enhanced knowledge transfer between EAF stakeholders;
- increased potential stakeholder return on investment through sharper focus on joint priorities for the EAF; and
- improved understanding of effective community stakeholder engagement strategies.

Conclusion

The sharing of specialised knowledge can be very powerful. The decision to engage purposefully with international researchers with intimate knowledge of aquaculture research facilities during the planning stages of the EAF design process has proved to be of great value to the Tasmanian industry stakeholders.

This engagement has directly contributed to changes in the proposed EAF design and in the approach to governance as well as identifying additional community interaction opportunities.

The relationships forged as a result of this process will provide continued return, as evidenced by the planned visit by industry stakeholders to the NIWA facilities in New Zealand (a direct result of this project).

All outcomes that were originally identified when the project was proposed were achieved. Several additional outcomes have been realised, particularly in relation to knowledge transfer.

This project forms part of the ongoing EAF design process. As such, the discussions and interactions that occurred as part of this project will continue to inform the EAF's purpose, design, management and governance.

References

http://www.daff.gov.au/__data/assets/pdf_file/0016/1623211/fish.pdf - National Fishing and Aquaculture RD&E Strategy 2010, DAFF, accessed 07/02/2013

http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Fishing~182 – Year Book Australia, 2012 – Fishing – electronic version, accessed 07/02/2013

IMAS strategic plan - http://www.imas.utas.edu.au/__data/assets/pdf_file/0005/327317/UNW_3290_IMAS_StrategicPlan_logos_page33.pdf

Appendix 1: Intellectual Property

N/A

Appendix 2: Project Team

Project design, delivery and reporting were provided by the following RDS Partners project team:

- Tom Lewis, Project leader;
- Morag Anderson, Project manager;
- Maree Fudge, Trans-Tasman workshop design and facilitation;
- Karly Herighty, Logistics and communication support;
- Ray Murphy, Logistics and communication support; and
- Alice Doyle, Finance manager.

The international experts who gave their time, insights and expertise to the project:

- Leo Nankervis, Senior Researcher, Skretting Aquaculture Research Centre, Stavanger, Norway;
- Brian Kingzett, Deep Bay Marine Field Station Manager, Center for Shellfish Research, Vancouver Island University, Vancouver Island, Canada;
- Andrew Forsythe, Chief Scientist, Aquaculture and Biotechnology, National Institute of Water and Atmospheric Research Ltd (NIWA), Auckland, New Zealand.

Appendix 3: Feedback Survey

Participants at the meeting on 30th January 2013 were asked to provide feedback regarding the results, impacts or consequences of bringing the three experts to Tasmania.

The following text was sent as an email to all participants.

"Thank you for your participation and your input during the meeting(s) with Leo Nankervis, Brian Kingzett and Andrew Forsythe.

As you are probably aware they were able to come to Tasmania to provide advice regarding the EAF courtesy of FRDC funding. RDS Partners is preparing a draft report to FRDC on this funding which included the facilitation provided by RDS Partners. One of their questions is "what are the results, impacts or consequences" of the funding. (The title of the project is "UTAS Experimental Aquaculture Facility: Obtaining expert international governance, design and operational advice for the Atlantic salmon partners".)

Could you please answer a few short questions by close of business Wednesday 13th February to assist us with answering the FRDC funding requirements? We're after impressions rather than essays, but feel free to give longer answers if you'd like.

1. On a scale of 1 (excellent) to 5 (really atrocious), how would you rate the benefits to your organisation of having Leo, Brian and Andrew visit Tasmania?

a. regarding the EAF specifically?

b. more generally?

2. What were/are/might be the benefits of having Leo, Brian and Andrew visit Tasmania for you and/or your organisation:

a. regarding the EAF specifically?

b. more generally?

3. What has changed or is likely to change for you or your organisation due to direct contact with these people?

4. How might their visit impact the wider community in any way now or into the future? (or to ask it the reverse way, what might not happen if they hadn't visited?)

5. Were there any unexpected things as a result of their visit and associated meetings and discussions?

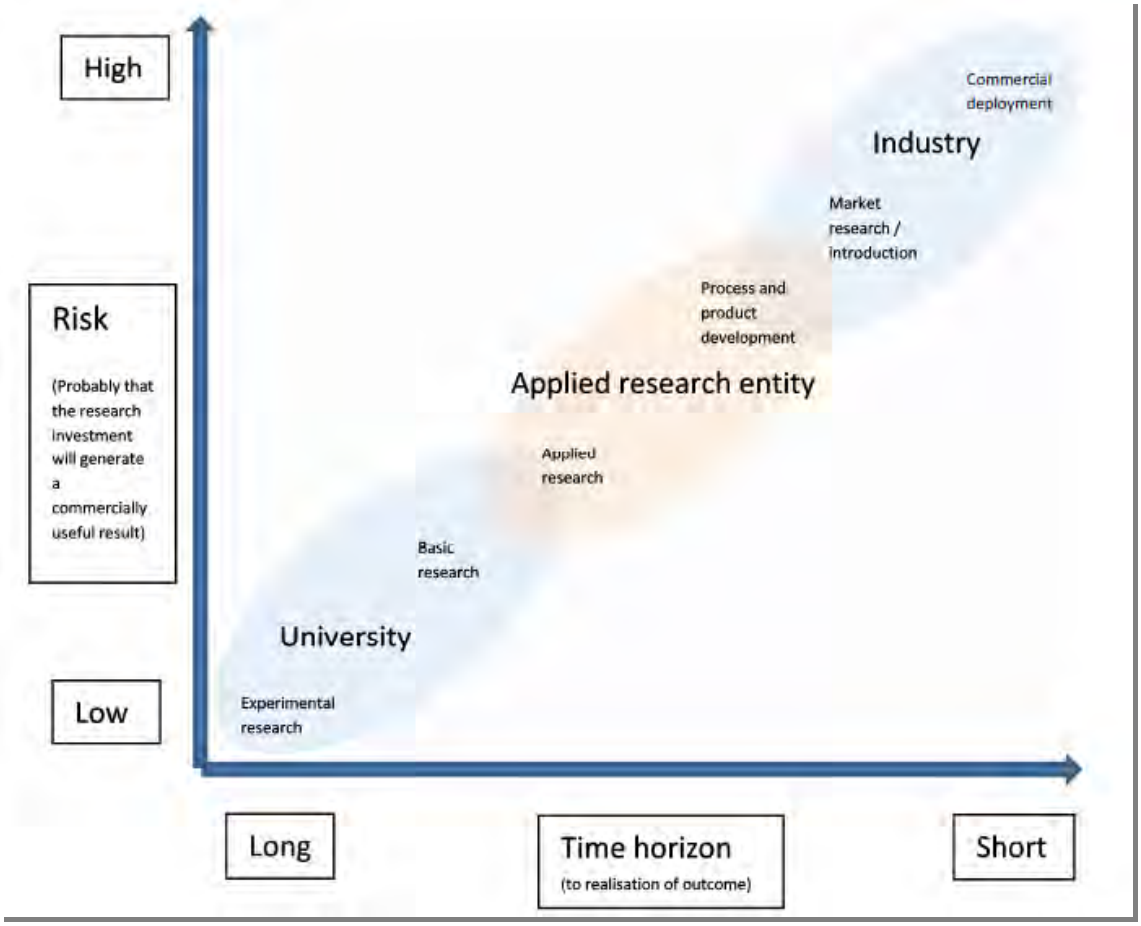
6. Any other comment(s) you'd like to make…?

Thanks for taking the time to do this, we appreciate it and know that you are all busy people. If you could send your reply emails to Morag and Tom, that'd be great. Any issues feel free to contact us."

Appendix 4: Post-visit feedback from visiting experts

Feedback provided by Andrew Forsythe, NIWA

A few thoughts on the proposed Experimental Aquaculture Facility



Consider the above matrix. The proposed Experimental Aquaculture Facility must provide the applied research to respond to the commercial research needs of Tasmanian salmonid growers. While shellfish are to be considered, weighting of their interests must reflect their investment in the project. The governance and staff selection must be organised to ensure the university and industry can effectively extend their roles to build an effective applied science middle ground. The institution must serve industry need; the mandate of the key decision makers must be to support industry in the most pragmatic way possible. Industry must recognise that the enduring elements of their value proposition will require some robust, long-term research. Academics must recognise that their research interests may need to be overwritten by commercial need.

Is this function needed?

Yes: there are industry and region specific knowledge gaps with major commercial impact potential such as AGD, summer gut syndrome, environmental effects (high

seasonal temperatures, reduced oxygen and pH), genetic- environmental interactions and aquaculture –environment interactions.

Can the EAF serve this function?

The principal contribution that the university offers is in regard to aquaculture environment interactions, not matters of production capacity or efficiency. The university must recognise that the commercial coal face is not the academic coal face. Industry must understand the importance of the underpinning science, particularly in matters of environment, the wholesomeness of the food being produced and the welfare of the stock. These underpin social license to produce and sell the products.

In principal, integrating industrial and academic aquaculture R&D into a single facility should ensure harmonisation of activities to deliver value to the sector. There is no question that the benefits of R&D expenditure will predominantly be realised through sustained and profitable growth of Tasmanian salmonid farming. All other outcomes will remain aspirational or peripheral for the foreseeable future.

Sustained growth can only be achieved through retaining or improving the realised margin on the product while increasing the production.

- Improve the quality, increase the quantity and reduce the cost of production of existing Species
- Improve capability to predict and manage commercial development to satisfy consumer and societal expectations for good environmental stewardship
- Develop research programmes which will garner real commercial interest and skin in the Game
- Generate knowledge that is transferrable to industry, not two steps removed

Location

There are some limitations on the site; it is small, elevated and largely a brown-field development. Salt water pump volumes will be restricted such that reuse and or recycling of water will be required. Improved access to fresh water will be critical.

EAF Value proposition:

For commercial enterprises:

- Provide the production system development, environmental management and operational tools to maximise sustainable commercial performance
- Secure product providence rooted in healthy animals, healthy environments and harmonious community relations

For regulatory authorities who function largely as arbitrators of social licence:

- Provide the environmental performance prediction and monitoring tools to maximise socially acceptable development

- Provide opportunities for sustainable rural economic development

The tasks at hand are very clear:

Industry has urgent need for fit for purpose solutions for AGD and improved production performance at high temperature and reduced oxygen and mechanisms to forecast and maximise the environmental carrying capacity of farm sites.

Regulatory authorities must ensure that the farming activities are, and continue to be, recognised as a socially responsible use of Tasmania's aquatic resources for state employment and wealth creation. Near field and far-field environmental effects must be considered. Coherence of environmental and economic drivers: e.g. progressive substitution of alternative raw materials for finite marine foodstuffs, public interest in animal welfare etc. should be identified.

The university research approach is likely to be most effective in addressing questions of aquaculture environment interaction. The scope for Tasmanian specific Atlantic salmon nutritional biology and immunology is limited and it should be recognised that most opportunities in this regard will be realised through technology transfer.

Providing the opportunities which accompany an academic / industry partnership are effectively managed by all parties, the proposed Experimental Aquaculture Facility and associated industry – university partnership will be key to the Tasmanian aquaculture industry achieving significant and sustainable growth.

Feedback provided by Leo Nankervis, Skretting

EAF thoughts: potential opportunities and risks

Opportunities – the opportunities associated with this facility are mostly governed by the good ideas that go into it. No research facility has inherent value, but the value is derived through its capacity to implement good research ideas.

- Salmon industry – address commercially important issues - AGD and high water temperatures.
    - AGD
        - Feed research – health feeds with AGD challenge
        - Genetics – heritability of AGD resistance
        - Implications of reinfection
    - High water temperature
        - Feed research – health feeds with temp challenge
        - Better understand physiology of fish under undesirable environmental conditions, especially with big fish and triploids.
- Oyster industry – Stock security from POMS/other diseases.
- University – funding opportunities and facilities for commercially oriented research.

Hazards/pitfalls

- There are many different stakeholders with different priorities.
    - Whose task is it to drive the decision making process in the design phase and push for consensus/make decisions? Maybe this is Simon's role?
    - Do the funding sources match the research/facility design priorities? There are obviously grander ideas than there is money to pay for it, so there needs to be a process of prioritisation and rationalisation of these ideas so that the facility meets the goals of the funding sources.
- Budget over-run. If the design/installation project goes over budget, how will extra costs be absorbed?
- Budget and governance for the operational phase.
    - Staff and management – key to success. For commercial success the staff need to be dedicated to the facility and have well established routines and excellent communication with the relevant contact people for each experiment.

- Ongoing budget – maintenance, consumables, repair, staffing, upgrades – how is this budget to be sourced and maintained? I think this needs to be addressed before the design is finalised, as it might impact on the final design priorities (eg. How much does it cost to heat 12 tanks to 24 degrees?). Is the facility to be charged on a user pays basis, or do the initial investors get credits for their investment towards use of the facility? In any case there needs to be an accounting system established where there is a value set upon use of the facility.

- Commercial perspective – if you invest $ into an R&D facility, any downtime is lost investment. The commercial priority should therefore be a purpose-built facility that can be used repeatedly with as little down-time as possible. They need a coordinator that will optimise the use of the facility. The commercial partners should also be challenged to commit to their use level of the facility to ensure that it is optimally used and is scaled according to actual need/use.

- Dispute resolution
  - Design phase – back to prioritising needs/wishes vs inputs.
  - Implementation phase – single-stage dispute resolution via a committee or multiple-stage (internal first, then committee if dispute still exists).

Feedback provided by Brian Kingzett, Vancouver Island University

Re: Comments on proposed Experimental Aquaculture Facility

Thank-you for including me in the workshops concerning the proposed research facility in Hobart. I enjoyed the discussions and saw many similarities in the same types of issues that we have grappled with in the development of the VIU Deep Bay Marine Field Station.

As requested and in addition to the comments I made during the workshops and related discussions, I am forwarding a series of notes and comments that I made during the trip as follows.

Please note that these are not in a particular order or priority and many are in the form of unresolved questions that I was left with. Many are issues that we are still grappling with in our own project, some are ones we missed, others we are proud of solving in our project. Not all have answers and are intended to raise flags for consideration and discussion.

Some may not sit well with everyone involved and I apologize in advance as it is not my intention, which is simply to stimulate a comprehensive discussion.

- Overall there is a strong basis for good university/government and industry collaboration leveraged by the significant investment that Industry is willing to make.
- Having an existing research campus allows project to build on leverage of intellectual capital already on site and should provide some operational costs savings related to administrative and general support.
- Unfortunately, the project is being driven by funding, not the other way around. The restriction that the moneys may only be used to renovate existing boat storage area will significantly restrict the ability to build a proper facility. During the meeting, I repeatedly asked myself whether in the long term; would the compromise that this required be justified over the lifetime of the project? Alternately if the imposed conditions were challenged would this reduce probability of alternate capital financing?
- Questions regarding marine water quality remain. A sidebar story I like to repeat – Early aquaculture researcher in BC, Dr. Dan Quayle once told me at the start of my career that: *there was no point in doing site selection studies because most aquaculturists would site their farms where they, not the animals wanted to be and that the site owners would then spend the rest of their careers paying for that decision.* I have observed this parable to be true time and time again in the 20+ years since I was scolded with it.
- The site in general is small and will be limiting for access of researchers, large trucks etc. All further developments on site will be compromised by the lack of space. Integrating the EAF into a site Master plan should occur early in the planning process.

- Very little consideration has been given to including community access on the site. The model being followed of classic, cloistered, university-based research makes it harder to help develop community based social license for aquaculture through a culture of openness. This concept may be harder to grasp by traditional researchers than industry.
- Salmon farming industry identified AGD as the single largest cost of production and issue to be overcome for the industry – however this was a lower priority identified by researchers in driving the development of the EAF. This begs the question – what form of research will be required to produce and test solutions to AGD and can this be accomplished on the scale being proposed by the EAF scale?
- Lack of sufficient large volumes of freshwater on site will potentially add additional expense through purchase, trucking, potentially extensive use of recirculation technologies. This is significant in that AGD treatments are dependent on freshwater.

Comments on Hobart UTAS proposed EAF

- Industry is intending to spend significant dollars on development and funding of the EAF but are priorities being set by the industry or researchers? A clear oversight mechanism for this was not clear. Arguably independent university and government researchers need to be capable of acting independently of industry when conducting research – however in this case industry is expected to be paying for a significant part of the capital and research funding. Was not clear to me how research priorities would be set and how governance would be conducted in new facility. Some researchers appeared to have clear goals and research programs but it was not clear if these meshed well with industry.
- Significant industry investment in facility demands that processes for governance and research direction are well established. The existing model being proposed appeared to be University supporting facilities and driving research direction with consultation and industry financial support (traditional). From an industry perspective, I think industry should ask whether an alternative model where industry operated research facility directly and invited external researchers into the site would more suite priorities. Obviously both approaches would have pros and cons related to governance and operational longevity (funding).
- Partnerships and involvement with Skretting significantly influence the development of the EAF to support nutrition research. This is furthered by nutritional researchers involved (university/CSIRO). However in terms of industry priority will this provide the gains that industry needs in light of costs of production related to AGD? This is compounded by the fact that Skretting already has advanced internal R&D facilities and expertise in house and can make many of the nutrition research gains outside of Tasmania.
- Increases in facility volume at existing site to meet finfish needs will require increase in intake line (capacity, twinning etc.). Costing had not been conducted at the time of meeting and it was unclear what regulatory costs or timing to install would be. This

can have significant regulatory and civil costs and the project should establish a baseline for these costs very early in the process as this may affect feasibility.

- The existing seawater treatment system appeared to be insufficient for twinning and required a large amount of relative space.
- Existing shellfish facility floor space adequate for hatchery research, however the shellfish phytoplankton and larval systems require significant upgrading to be consistent with modern practices. Note that Tasmanian shellfish industry is relatively up to date on state of best practice for hatcheries.
- Unclear from other shellfish industry stakeholders whether there is substantial need for university based brood stock programs. I tend to disagree with obvious personal bias, but believe that strong research capacity is necessary to have ahead of new problems that may emerge. Obtaining a clear directive that on-going support for shellfish related programs exists may be required to justify capital investment.

Australian Government

Fisheries Research and Development Corporation

Fisheries Research House
25 Geils Court, Deakin ACT
Postal address: PO Box 222, Deakin West ACT 2600, Australia
Tel: (02) 6285 0400 International: 61 2 6285 0400 Fax: (02) 62854421 International: 61 2 6285 4421
Email: frdc@frdc.com.au