



**Australian Government**  
**Department of Agriculture,  
Fisheries and Forestry**

**National  
Aquaculture  
Council**



# **Making the most of Education, Training and Workplace Opportunities for the Australian Aquaculture Industry**



**Dr Paul McShane**

**June 2004**

© Commonwealth of Australia 2004

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from the Commonwealth available from the Department of Communications, Information Technology and the Arts. Requests and inquiries concerning reproduction and rights should be addressed to the Commonwealth Copyright Administration, Intellectual Property Branch, Department of Communications, Information Technology and the Arts, GPO Box 2154, Canberra ACT 2601 or posted at <http://www.dcita.gov.au/cca>.

## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b> .....	1
Survey Participants – Phase One.....	1
Survey Participants – Phase Two.....	3
<b>EXECUTIVE SUMMARY</b> .....	5
<b>INTRODUCTION</b> .....	7
Data Sources.....	8
<b>CURRENT EDUCATION TRAINING AND WORKPLACE OPPORTUNITIES</b> .....	9
Current Training Services (VET) .....	9
Current Training Services (Higher Education).....	11
Southern Cross University .....	11
James Cook University .....	11
Central Queensland University .....	12
University of Tasmania .....	12
Curtin University of Technology.....	13
Flinders University (SA).....	13
Deakin University.....	13
Aquatic Animal Health Management .....	14
Focus Group perspectives on Higher Education .....	14
<b>STRENGTHS AND WEAKNESSES IN AUSTRALIA’S PROVISION OF AQUACULTURE EDUCATION AND TRAINING TO SUPPORT REASONABLE GROWTH OF THE INDUSTRY</b> .....	16
Strengths .....	16
Weaknesses .....	16
Opportunities .....	17
Threats .....	17
What are the trends and influences, which you expect to impact on aquaculture enterprises in the mid-term (Impending changes and opportunities)? .....	18
What will be the nature of the work? .....	18
What do you think the operation will look like in 5 years time? .....	19

What standards are you aiming at? .....	19
What values does the organisation believe in? .....	19
What are the desired skills/knowledge for organisational success?.....	20
What would occur if government support for training and education were no longer available? .....	21
<b>CAREER PATHWAYS AND EDUCATION TRAINING OPPORTUNITIES</b> .....	22
Profile one: Anne – Employed as a Farm Hand in Salmon Aquaculture.....	22
Profile Two: Johnny – Leading Hand .....	24
Profile Three: David – Supervisor at a Prawn Farm .....	26
Profile Four: Rebecca – Operations Manager on a Tuna Farm.....	28
Profile Five: Selina – Aquaculture Entrepreneur .....	30
<b>CULTURALLY APPROPRIATE EDUCATION AND TRAINING MODELS FOR INDIGENOUS AUSTRALIANS</b> .....	31
Case study 1: Snowy River Native Fish Hatchery (SRNFH), Orbost, Victoria .....	32
Case study 2: Nalta Ruwe Yabby Farm, Berri, S.A.....	33
Case study 3: Cobowra CDEP Traineeships in Oyster Farming in Southern New South Wales .....	34
Case Study 4: Sector Specific Training to Aboriginal Communities in WA .....	35
Lessons Learnt from the Case Studies in Indigenous Training .....	35
<b>GOOD PRACTICE MODELS OF TRAINING</b> .....	36
Strategic Plans for the Aquaculture Sector.....	36
Trainers case study: Seafood Trainers Community of Practice .....	37
Introduction .....	37
For Trainers and Assessors .....	38
For Training Providers .....	38
Professional Development.....	40
Industry Involvement.....	40
Community of Practice Outcomes .....	41
Expansion of Commercial Networks .....	41
Recommendations for Engaging and Empowering a Community of Practice .....	41
Assessors Case Study .....	43
Leadership Development.....	43

Training Outcomes versus Industry/Community Development Outcomes ....	45
Mentoring.....	45
Personal Investment.....	46
Industry Nomination and Support .....	47
<b>STRATEGIES TO ENSURE THAT THE AQUACULTURE INDUSTRY IN 2010 AND BEYOND CONTINUES TO BE SUPPORTED BY COMPREHENSIVE, ROBUST AND RESPONSIVE EDUCATIONAL AND TRAINING SYSTEMS.....</b>	<b>48</b>
Potential Growth Areas/Future R & D needs.....	48
Training Needs/Skills to Meet Growth Areas.....	49
Current Skill Levels.....	52
Senior Management .....	52
Leading Hand .....	52
Farm Hand.....	53
Future Training/Education Needs.....	53
Obstacles to Servicing Projected Industry Needs .....	54
Opportunities to Service Projected Industry Needs.....	54
Develop and Draw Upon Social Capital to Make the Most of Knowledge and Skills .....	55
Middle management .....	55
Partnerships.....	55
More responsive RTOs.....	56
Industry meetings focusing on training .....	57
<b>IDENTIFIED BENEFITS OF A FOCUS GROUP APPROACH TO DEVELOPING INDUSTRY AWARENESS OF TRAINING PROGRAMS .....</b>	<b>58</b>
<b>FUNDING THE FOCUS GROUP CONCEPT .....</b>	<b>60</b>
<b>RECOMMENDATIONS.....</b>	<b>61</b>
<b>PROJECT TEAM .....</b>	<b>62</b>

Appendix I	Phase 1 Questionnaire
Appendix II	Phase 2 Questionnaire
Appendix III	Focus Group Participants
Appendix IV	Notes form North Queensland Indigenous Aquaculture Forum
Appendix V	Results from Phase 1 Survey
Appendix VI	Results from Phase 2 Survey
Appendix VII	Results from Phase 2 Survey - Responses to Production Levels
Appendix VIII	Success Stories in Training and Education
Appendix IX	Training and Education Providers in Your State
Appendix X	Industry Associations in Your State
Appendix XI	Government Incentives and Programs

## ACKNOWLEDGEMENTS

We gratefully acknowledge The Department of Agriculture, Fisheries and Forestry (DAFF) for funding this project, Seafood Training Australia (STA) for overseeing the project and DOS Aqua Consultants for information and support provided.

Special thanks goes to all those who freely assisted in providing valuable information and input for the project, in particular the participants of the Focus Group and all the participants of the phase one and two surveys.

## SURVEY PARTICIPANTS

### Phase One

Organisation	Contact Name
Australian Fisheries Academy	Doug Parker
Hobart College	Ruth Farley or Mike Sugden
Seafood Training Tasmania	Rory Byrne
Victorian Warmwater Aquaculture Association	John Mosig
Aquafin CRC/ PIRSA	Dr Peter Montague
National Aquaculture Training Institute	Dos O' Sullivan
South West Regional College of TAFE	Tim Storer
Cooloola Sunshine Institute of TAFE	Tony Carmody
IDC-Hunter	Troy White or Dan Liszka
Goulburn River Trout Pty Ltd	Wil Conn
UTAS	Professor Chris Carter
Northern Fisheries Centre (Qld DPI)	Michael Heidenreich
Southern Cross University	Vicki Harriott
Murray TAFE	Pat Wake
Challenger TAFE/WA Maritime Training Centre	Kingsley Waterhouse
James Cook University	Associate Professor Paul Southgate Associate Professor Rocky De Nys

<b>Organisation</b>	<b>Contact Name</b>
Flinders University	Dr Jian Qin
Central Queensland University	Les Unwin
The Underwater Centre Fremantle	Ian Milliner
North Melbourne Institute of TAFE	Darren Exton
Australian Barramundi Farmers Association/Seafood Farming Services	Carl Young
Seafood Services Australia	Ted Loveday, Jayne Gallagher or Alan Snow
Charles Darwin University/ Northern Territory University	Michelle Lewis
Competency Based Trainers	Bernard Dobson
Cowell Area School	Lorraine Walford
Dover School	Steven Harrison
Aquasearch	Dr Braley/ Nell Braley
North Coast Institute of TAFE/ Natfish	Glenn Searle/ Lisa Terry
Spencer Institute of TAFE	Martin Daintith
Illawarra Institute of Technology/TAFE	Graeme Lown
Salmon Enterprises of Tasmania Pty Ltd (SALTAS)	Graham Martin or Eoin Ryan
Kimberely College of TAFE	Tony Salisbury or Jeff Cooper
Australian Maritime College	Alistair Broatch

**SURVEY PARTICIPANTS****Phase Two**

<b>Organisation</b>	<b>Contact Name</b>
Paspaley Pearls P/L	Dr David Mills
Cygnets Bay Pearls	Bruce Brown
Seafarm Pty Ltd	Andrew Crole
Marine Harvest	Paul Basher
G FB Fisheries Ltd	Dr Trevor Anderson
Tastey Prawns	John Rossman
MG Kailis	John Atkinson & Roger Barnard (Exmouth Hatchery)
Southern Barramundi	Steve Mawer
Curtin University - Applied Biosciences	Dr Glen Whisson
ARMS	Dr Glen Whisson
Blue Lagoon Mussels	Glenn Dibbin
Cell Aquaculture	Quenton Leach
O I Rural	Geoff Rossman
Aquatic Solutions Australia	Brett Stevens
Cambinata Yabbies	Amanda Nenke
Australian Barramundi Farmers Association	Carl Young
QDPI Extension Officer	Max Wingfield
Bay Fish	Nathan Patrick
SAM Abalone Pty Ltd	Shane McLinden (Director)
Ironback	Bill Keast
Australian Fishing Enterprises	Colin Eagle
Van Diemen's Aquaculture	Bruce Hogarth

Organisation	Contact Name
Southern Ocean Mariculture	Mark Gervis
Great Southern Waters Ltd	Melinda Clarke
Nalta Ruwe Aboriginal Corporation	Jason Karpony
Ocean Wave Seafoods	Peter Rankin
MC & AN Whillas	Michael Whillas
Richmond Council Aquaculture Project	Richard Stewart
Australian Prawn Farmers Pty Ltd	Jeff Harrison
Huon Aquaculture Company	David Wood
Smithton Shellfish	Paul Viney

In addition to those presented above, useful discussions with the following individuals led to additional insights: Dr Peter Montague (Aquafin CRC), Professor Chris Carter, Dr John Purser, Dr Barbara Nowak (University of Tasmania); Dr Chris Austin (Deakin University), Mr Rory Byrne (Seafood Training Tasmania), Jo-Anne Ruscoe (Charles Darwin University), Mr Martin Smallridge (Seafood Council SA).

## **EDUCATION AND TRAINING NEEDS TO 2010: CURRENT GAPS AND FUTURE OPPORTUNITIES**

### **EXECUTIVE SUMMARY**

An assessment of current and projected needs to support growth in the Australian Aquaculture Industry was undertaken by:

- Surveying training providers (including TAFEs and Universities) to determine current course structures and content, linkage to the Seafood Industry Training Package, flexibility in training programs, and Industry linkage;
- Conducting a two day focus group of Aquaculture Industry participants (generally at middle management level) representing the main sectors of the Industry (Tuna, Pearls, Salmonids, Oysters, Prawns, Native fin fish) including both large (> 1000 employees) and small enterprises (owner operators);
- Using the findings and outcomes from the focus group, to conduct a follow up survey of other Aquaculture Industries including emerging sectors.
- Consolidating existing information, case studies, and discussions with other stakeholders.

#### **The assessment of current and projected needs revealed:**

- The Australian Aquaculture Industry is expected to double production by 2010. However, a desire to improve efficiency in production will decrease participation by semi-skilled workers and increase the application of technology. This will substantially change the mix of skills in the Industry;
- Industry has relatively little understanding of current training pathways (including the Seafood Industry Training Package (SITP)). As a consequence, Industry is generally disengaged in training. Development of information material (from this project) and greater utilization of the National Aquaculture Portal ([www.australian-aquacultureportal.com](http://www.australian-aquacultureportal.com)) will assist in developing Industry knowledge of training opportunities;
- Current training and education course content and pathways cover most of the needs identified by Industry as supporting planned growth in Aquaculture towards 2010 i.e. human capital development, business management, marketing and promotion, environmental management. Indeed, new additions to the SITP, including the Leadership elements, provide for flexible workplace training in these key areas;
- Although there has been substantial change in Aquaculture programs offered by Australian Universities, they tend to underemphasize the priority discipline areas identified above. In particular, Aquaculture Engineering/technology is poorly

represented in Higher Education courses. This finding is significant given the projected increase in application of technology in Aquaculture.

#### Key recommendations are:

- Harness and develop the social capital in the Aquaculture Industry via focus group engagement. Thus, experienced individuals, exposed to Industry development opportunities, will encourage greater participation by the grass roots. Similarly, access to Industry champions by government stakeholders via the focus group model will align government and Industry aspirations;
- Extend the National Seafood Industry Advanced Leadership program to allow mentored support for Aquaculture Industry participants. Industry participants can link to the Leadership component of the SITP. Industry participants will be key drivers engaging grass roots participation in training and education.
- Support and fund the engagement of Industry (e.g. by the Australian Rural Industry Council, the Human Capital Development program of the Fisheries Research and Development Corporation (FRDC) and Farmbi\$ (DAFF and individual state programs)) to recognize the opportunity cost of participation away from the workplace.
- Develop centres of excellence in Engineering, biotechnology, and aquatic health management to provide the specialist capacity needed rather than diluting capacity across several institutions. Intense bridging courses addressing prerequisites for higher education in Aquaculture is a practical and cost-effective way of providing realistic training pathways. Intensive short courses in specialist disciplines is also attractive to Industry participants who cannot afford full time study.
- Develop and support a network of assessors to facilitate workplace training and assessment with key individuals in each state responsible for developing, retaining and applying workplace assessment, Industry knowledge and advances in training practice to subordinate assessors. In this way, a relatively small pool of proactive engaged individuals can link training providers with Industry. The Community of Practice model for trainers provides a successful working example of this model.

*“The overall recommendations from the report are clearly defined and certainly would be endorsed by Paspaley Pearls. It is refreshing to see that the industry, through the focus group, has had a real and direct input into the development of an important policy development document at the National level.”*

Dr David Mills, Manager-Research and Development, Paspaley Pearls P/L, Darwin.<sup>1</sup>

---

<sup>1</sup> Letter to Paul McShane 9 June 2004.

## INTRODUCTION

The aim of the Aquaculture Industry Action Agenda is to move the industry to a higher and sustainable growth path by identifying impediments to growth and removing them; by finding opportunities and acting on them; and Industry and Government working together with existing resources.<sup>2</sup> The initiatives and actions arising from the Aquaculture Industry Action Agenda, as they apply to education, training and workplace opportunities, include developing the capacity of the aquaculture industry by converting the intellectual capital of its workforce into a highly competitive product or service.<sup>3</sup>

This project documents current provisions for aquaculture education and training in Australia; identifies the adequacy of current provisions to support growth of the aquaculture industry to 2010, and suggests strategies for accessing opportunities and addressing weaknesses. The aims of the project are to:

- Identify current education, training and workplace opportunities;
- Identify strengths and weaknesses in Australia's provision of aquaculture education and training to support responsible growth of the industry;
- Provide information on career pathways and education/training opportunities;
- Identify and communicate culturally appropriate education and training models for indigenous Australians;
- Promote good practice models of training;
- Support the development of, and ability to draw upon, social capital to make the most of knowledge and skills;
- Implement a continual monitoring, maintenance and enhancement process, which will identify limiting factors as they arise;
- Identify strategies to ensure the aquaculture industry in 2010 and beyond continues to be supported by comprehensive, robust and responsive educational and training systems.

In essence, the project seeks to align current and future Aquaculture industry needs with capacity and responsiveness of training and education providers. The report is structured to address the component aims above.

---

<sup>2</sup> Aquaculture Industry Action Agenda Discussion paper June 2001. National Aquaculture Development Committee.

<sup>3</sup> In "Final Aquaculture Industry Action Agenda: Initiatives and Actions December 2002.

## DATA SOURCES

In addressing the aims presented above, information was accessed from the following sources:

- Telephone surveys of training providers using a questionnaire designed to assess content, delivery mode and Industry linkage (33 responses) (see *Appendices 1 & 5*);
- Follow up telephone interviews with selected training and education providers;
- A two-day focus group involving Industry representatives (large and small enterprises, individual sectors, indigenous) (see *Appendix 3*);
- Face to face surveys of Industry participants using a questionnaire designed to build on focus group outcomes and to identify current (and likely future) gaps in training and education needs of the Australian aquaculture industry (31 industry representatives were surveyed) (see *Appendices 2, 6, & 7*);
- Analysis of proceedings of the North Queensland Indigenous aquaculture forum (Cairns, May 2004), and meeting of indigenous representatives of North Queensland Indigenous aquaculture working group (see *Appendix 4*).

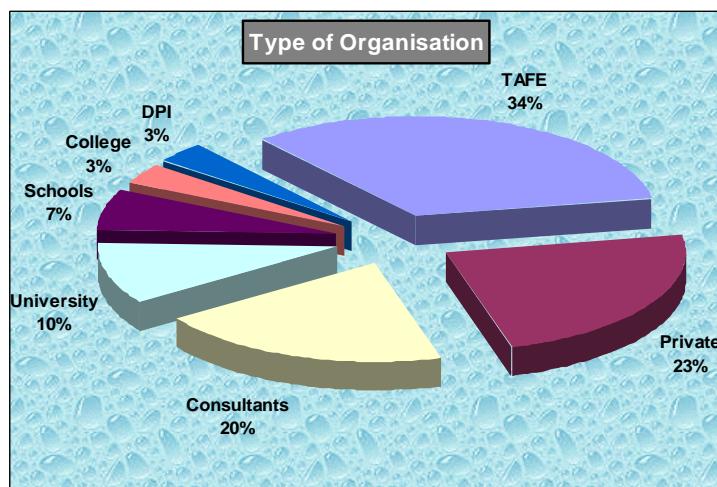
In addition to the above, information from other sources was used including:

- Websites of education providers (used mainly to describe and assess University courses in Aquaculture) and other stakeholders (including Seafood Training Australia);
- Various strategic plans produced by Industry Training Advisory Boards (WA, SA, Tas, NSW, Qld, NT);
- The Executive Summary of “The Scoping Study Report into opportunities for Indigenous Aquaculture in North Queensland” by Minniecon and Burke p/l. (Final report not yet released);
- A draft report on “Education and Human Resource Allocation in the Aquatic Animal Health Sector” by Glenn Schipp;
- Informal discussions with Aquaculture Industry leaders and stakeholders.

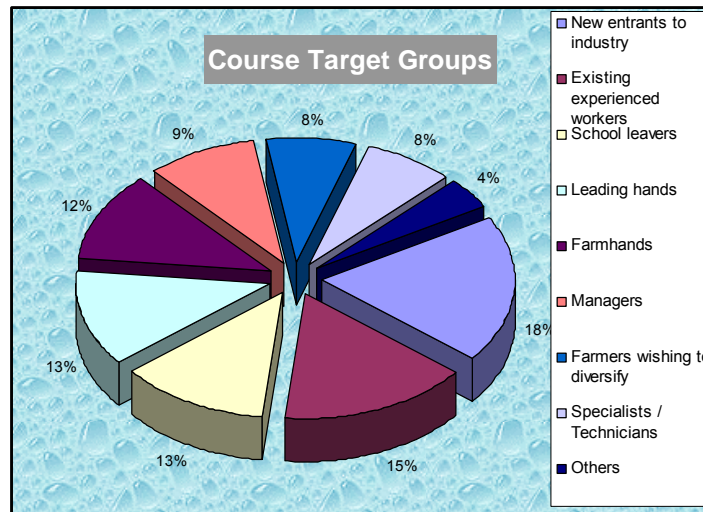
## CURRENT EDUCATION, TRAINING AND WORKPLACE OPPORTUNITIES

### CURRENT TRAINING SERVICES (VET)

Most of the respondents to the surveys of training providers were in Vocational Training and Education (VET) (10 TAFE's, 1 College, 7 private providers, 2 Schools, 1 Department of Primary Industry and 6 others (consultants)). However, 12 of these providers were not registered training organisations (RTO's). The types of organisations participating in Aquaculture training and education are presented graphically below.



Most organisations surveyed provided courses relevant to the Aquaculture Industry including food safety, environmental management, business management, disease management, and quality assurance (ranging from Cert I to Diploma in the Seafood Industry (Aquaculture) (see [www.seafoodtraining.com.au/trainingpackage](http://www.seafoodtraining.com.au/trainingpackage) ). About half of the providers offered training aligned to competencies specified in the Seafood Industry Training Package (SITP). Of note, however, is that only 5 providers offered leadership training through the SITP. The survey revealed a diversity of groups targeted by training providers as shown below. This demonstrates the versatility and flexibility offered by the SITP.



More than half of the organisations surveyed claimed to use Industry personnel as trainers.

Constraints to the effective delivery of training identified from surveys of providers included:

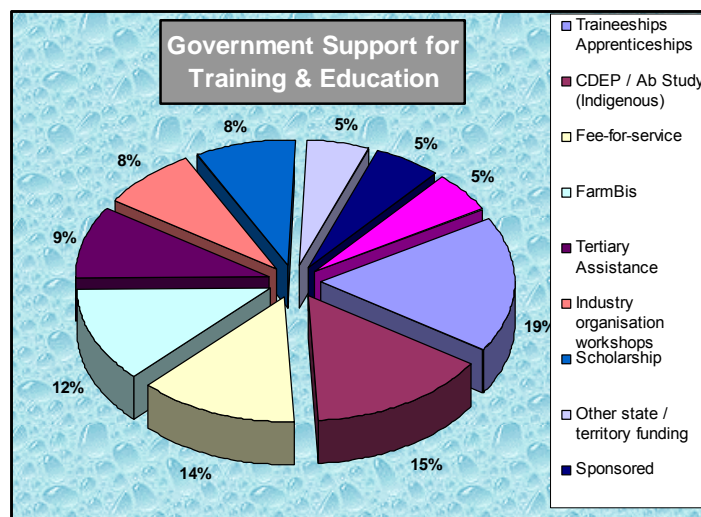
- poor perception by Industry of TAFE and other training providers;
- lack of knowledge by Industry of available training (see below);
- geographic dispersal of the Aquaculture industry.

Constraints to participation by industry in training identified from surveys of providers include:

- poorly developed training culture (in the Aquaculture industry);
- poor perception by Industry of training providers (i.e. not aligned to Industry needs) (Industry find training jargon associated with the SITP a disincentive to participation);
- bureaucratic inertia in dealing with paperwork associated with training;
- perception that training costs a lot through time off work.

Government incentives utilised by training providers (as revealed from the survey) are presented below. Points to note are that traineeships are a significant source of support for training. Furthermore, short term training programs such as Farmbi\$ and fee for service are significant sources of training support.

Surveys of training providers revealed that most (77%) offered workplace training or a mixture of workplace and institutional training. The preferred mode of delivery was face to face (37%) whereas remote (i.e. internet/distance) was preferred by 16% of the training providers surveyed. Other modes of delivery were group (e.g. Farmbi\$ programs) (30%) and other (including workplacements/traineeships (17%).



## CURRENT TRAINING SERVICES (HIGHER EDUCATION)

Various Australian Universities offer degrees with an Aquaculture specialisation. These range from minimal content (e.g. Southern Cross University offers a degree in Fisheries and Aquaculture management yet offers only one Aquaculture subject) to substantial Aquaculture content (including University of Tasmania and James Cook University). Most offer the usual suite of subjects applicable to a marine science degree (chemistry, quantitative methods, ecology, microbiology, genetics). However, most if not all, emphasise biological aspects of Aquaculture at the expense of business and administration (although some exceptions are noted below).

### Synopses of University courses follow:

#### Southern Cross University

Southern Cross University (North New South Wales) offers a Bachelor of Fisheries and Aquaculture Management (see [www.scu.edu.au/schools/esm/courses/fisheries](http://www.scu.edu.au/schools/esm/courses/fisheries))

The course provides an emphasis on marine biology and ecology with an Aquaculture Management subject in second year.

#### James Cook University

The university offers considerable specialisation in Aquaculture particularly tropical species aquaculture. In this context, the university attracts international students. Like other degree courses in Aquaculture, James Cook University includes marine science subjects. However, the university has introduced a four year applied science degree with the fourth year providing an aquaculture management focus. In particular, the Applied Science option provides an on-farm component where students are required to develop an intensive fish farming operation from start to finish incorporating a compulsory business-planning component in their third and fourth year<sup>4</sup>. The business content of the course is delivered through the Business School (JCU). This hands-on approach is popular with Industry with graduates finding employment in related fields. Also assisting in linking the academic program with Industry is the requirement for students to complete at least one month of commercial farm placement.

Non-biological subjects offered include: management of culture systems, aquaculture systems design; aquaculture management. Aquatic animal health is well dealt with through specialist courses provided by Microbiology and Immunology specialists engaged through the Queensland Department of Primary Industries with specific courses offered in pathology of aquatic organisms and marine microbiology.

The university does not generally give credit to students presenting with VET qualifications (e.g. Diploma in the Seafood Industry (Aquaculture) although it treats each student on a case by case basis. The requirement for demonstrable capacity in mathematics and chemistry sets a minimum standard of entry to deal with the course requirements at second and third year level<sup>5</sup>.

<sup>4</sup> Discussion with Associate Professor Rocky De Nys, James Cook University.

<sup>5</sup> Discussion with Associate Professor Rocky De Nys, James Cook University.

## Central Queensland University

Central Queensland University (CQU) offers two Aquaculture subjects as part of an Aquatic Resource Management specialisation of a Science Degree (see [www.cqu.edu.au/cquhbk2001r2/ugsubjects/aqua12003](http://www.cqu.edu.au/cquhbk2001r2/ugsubjects/aqua12003)).

Other subjects include Water Quality Management, Aquatic Systems, Botany of Aquatic Environments, Aquatic Physiology and Microbiology. Advanced standing in the degree program is provided to holders of a Diploma in the Seafood Industry (Aquaculture). This advanced standing provides an opportunity for holders of a Diploma to get a degree with an additional two years of study. This training pathway is significant as individuals with practical industry experience get an opportunity to obtain higher-level skills at degree level. In recognition of the participation of individuals already working in the Aquaculture Industry, the degree program is offered in flexible (external) mode including part time and intensive residential programs. Of note is that about 40% of graduates from the program have undertaken the flexible program. Individuals can also choose chemistry, business and engineering electives to augment aquaculture-orientated subjects in the degree program.

## University of Tasmania

The School of Aquaculture offers the following specialist aquaculture courses: diploma, degree, honours, graduate diploma, Masters (coursework), Masters (research), PhD (see [www.scieng.utas.edu.au/aqua/](http://www.scieng.utas.edu.au/aqua/)). The University of Tasmania was the first University to offer a specialist degree in Aquaculture and for nine years was awarded Key Centre status. The School has strong links across the aquaculture industry and with other national and state research organisations. Industry links are facilitated through direct consultancies or through research links via strong representation on Cooperative Research Centres (Aquafin CRC, Aquaculture CRC), several FRDC sub-programs and ARC schemes. Industry links are also maintained through the School's External Advisory Group, course development, professional placement and other collaborative programs.

The diploma, degree and graduate diploma programs offer considerable specialisation in Aquaculture education and training for a wide range of student intakes following Industry related careers. Courses integrate core culture (fish, crustaceans, molluscs, algae, live feeds) orientated units with technology, policy and operations, fish health, nutrition, physiology, microbiology, ecology, statistics, computing and chemistry units. Course content is developed in consultation with Industry, providing a mix of production and management techniques, aquaculture science and research findings. Courses are delivered by nine academic staff from the School (and who only teach SOA units), plus several post-doctoral and doctoral scientists from within TAFI, and guest presenters from Industry and government. The courses are delivered through combinations of lectures, hands-on practicals, projects, skills training, industry field visits and seminars by Industry and research personnel. All course based qualifications contain a professional placement program in industry.

The University offers a double degree Bachelor of Aquaculture/Bachelor of Commerce reflecting the business environment in which Industry operates. This option has to date not attracted significant numbers of students. Formal articulation with VET pathways (e.g. Certificate to Diploma; Diploma to Degree) is currently being developed and viewed as being important. To date credit for entry to degree courses from VET programs has been assessed on a case by case basis.

## Curtin University Of Technology

Based in Western Australia, Curtin University of Technology offers a BSc (Aquatic Resources and Fisheries Management) including a range of subjects with an Aquaculture emphasis. Non-biological subjects offered include: Agribusiness systems, Aquaculture technology, Aquaculture economics and policy, and Hatchery technology. Of note is that the University offers study tours (domestic and international) as an option for students. Curtin offers Aquaculture Health Management as a second year subject.

Curtin also offers a degree in Agribusiness with an Aquaculture major. The focus is on developing skills in the management and optimisation of systems to achieve profitable and sustainable outcomes.

Applications for recognition of prior learning are assessed on an individual basis. Recognition of prior learning may also be awarded for approved TAFE units.

## Flinders University (SA)

Flinders University offers a Bachelor of Technology (Aquaculture) (see [www.scieng.flinders.edu.au](http://www.scieng.flinders.edu.au)). Non-biological subjects relevant to Aquaculture include: Aquaculture Operations and Safety, Chemistry for Aquaculture; Aquaculture systems; Aquaculture procedure; Aquaculture Management and Marketing. Of note is that the University offers an introductory subject in Fish Health (second year) and Fish Health and Hygiene (third year). The University has a strong relationship with a VET provider (Spencer Institute of TAFE). Indeed, Spencer Institute of TAFE is involved in delivering marketing units to the degree program. This relationship also assists in presenting training pathways with a 45-unit credit (of 108 units in the degree) offered to students who have completed a Diploma in the Seafood Industry (Aquaculture). Thus, those with practical experience and competencies in various tasks associated with Aquaculture can complete a degree in two years<sup>6</sup>. Spencer Institute of TAFE is located in Port Lincoln one of the fastest growing areas of Aquaculture industry development. However, Flinders University has lost many key staff in Aquaculture and this has affected its reputation as an Aquaculture specialist.

## Deakin University

Deakin University offers a Bachelor of Environmental Science (Fisheries Management and Aquaculture) at its Warrnambool (Victoria) campus (see [www.scieng.flinders.edu.au/biology](http://www.scieng.flinders.edu.au/biology)). This degree comprises general aquatic biology/ecology and aquatic resource management. There is an opportunity to focus on Aquaculture through electives, which include Advanced Aquaculture and subjects offered through the Graduate Certificate and Graduate Diploma. These electives include: Aquaculture systems; engineering aspects in Aquaculture. Deakin offers a subject in Fish Health management and in Aquaculture genetics and biotechnology. Additional units in aquaculture management and policy are offered under a collaborative arrangement with the Australian Maritime College (see [www.gsrmr.amc.edu.au](http://www.gsrmr.amc.edu.au))

---

<sup>6</sup> Telephone Discussion with the Head of Aquaculture at Flinders University SA Dr Jian Qin

## **Aquatic Animal Health Management**

It has been noted (by members of the National Aquatic Animal Health-Technical working group) that there is a shortfall of aquatic animal health veterinarians servicing the Australian Aquaculture industry. Such capacity is specialised and requires advanced training in parasitology, virology, pathology, mycology and from the synopses presented above, most University aquaculture courses offer only limited exposure to Aquatic animal health. This training is only sufficient to develop broad understanding of Aquatic animal health.

There is specialist training in Aquatic Animal health facilitated through the Aquafin CRC (see [www.aquafincrc.com.au](http://www.aquafincrc.com.au)). A number of courses aimed at the Salmon and Tuna industries have been conducted. The courses are organised and delivered on site. The courses cover a range of topics. For example, for the Tuna industry, introductory courses on Tuna parasites and diseases investigation have been delivered. The Salmon industry has had a number of targeted courses including courses on epidemiology and disease investigation. Other courses for the Salmon industry have focused on Amoebic Gill disease and its prevention/control<sup>7</sup>. Dr Barbara Nowak of the University of Tasmania's School of Aquaculture offers an intensive program aimed at veterinarians aiming to up skill in fish disease identification, diagnosis and control. The University organises regular aquatic animal histopathology workshops. They are usually attended by fish health professionals, veterinary pathologists and researchers (including postgraduate students). Representatives of the Australian Aquaculture industry attend on occasions. The University of Tasmania also organises (together with AusVet Animal Health Services) workshops on epidemiology. These workshops are usually attended by researchers and postgraduate students. Workshops on fish immunology are organised less frequently and not as regularly as those noted above.

The identified gap in participation of fish veterinarians in the Aquaculture Industry does not necessarily reflect the shortage of trained personnel<sup>8</sup>. Rather it reflects the present lack of demand from Industry for specialist aquatic health practitioners<sup>9</sup>.

Further to the above, Melbourne University has a "fish week" providing Aquatic Animal health training to their Veterinary Science students. Professor Richard Whittington, recently appointed to the University of Sydney Faculty of Veterinary Science as the Chair of Farm Animal Health, is developing an Aquatic Animal Health component of the Veterinary Science course.

## **Focus group perspectives on higher education**

The focus group identified the following higher education issues:

- Aquaculture Graduates are too smart for their own good;
- Graduates need to start at the grass roots and not expect to go straight to a management position;
- Graduates need to be aware that they have to work in a team environment
- Graduates need to be aware of the working hours;

---

<sup>7</sup> Information provided courtesy of Dr Barbara Nowak, School of Aquaculture, University of Tasmania.

<sup>8</sup> Draft report on Aquatic Animal Health by Glenn Schipp ([glenn.schipp@nt.gov.au](mailto:glenn.schipp@nt.gov.au))

<sup>9</sup> Discussion with Dr Barbara Nowak Program Leader Fish Health Aquafin CRC.

- Graduates need to adequately prepare for the workplace – the real world;
- Aquaculture degree courses should encompass management.

There is clearly scepticism from Industry representatives about the value of Aquaculture graduates to the Aquaculture Industry. However, surveys of providers and discussions with University staff involved in Aquaculture education revealed that considerable efforts had been made to reflect Industry needs. Recent changes to curricula including business management, and other non-biological subjects reflecting Industry needs are examples of this. The recognition of the Diploma in the Seafood Industry (Aquaculture) varies among Universities with most not offering recognition towards a degree. Higher order skills in chemistry and mathematics as prerequisites for science-based subjects (including aquatic animal health, biotechnology, and engineering) set standards for VET graduates (eg. James Cook University runs bridging courses for students who lack these prerequisites). Consideration could be given to an appropriate bridging course to address this gap. Alternatively, Graduate certificates and Graduate diplomas offer pathways for experienced Industry participants looking to gain higher-level qualifications. Most universities recognise Industry experience and allow enrolment in graduate programs.

*“I think that the industry participants, as well as the other representatives, were all a little surprised to find that many of the issues were similar across all sectors, and the common issues were more to do with business skills, leadership and people management than production technologies.”*

Dr David Mills, Paspaley Pearls

## **STRENGTHS AND WEAKNESSES IN AUSTRALIA'S PROVISION OF AQUACULTURE EDUCATION AND TRAINING TO SUPPORT REASONABLE GROWTH OF THE INDUSTRY**

The strength weakness opportunity threat (SWOT) analysis to follow derives from a two-day focus group meeting of Industry sector representatives. The major Aquaculture sectors were represented at the focus group (Tuna, Pearls, Salmonids, Prawns, Oysters, Native finfish), as were small and large enterprises (*see Appendix 3*). The consolidated views of the focus group are presented below.

### **STRENGTHS**

- Considerable social and intellectual capital resident in the Australian aquaculture industry;
- Government supportive of training (Seafood Training Australia, the Seafood Industry Training Package, New Apprenticeship schemes, Farmbi\$);
- Some strong links between Industry, training providers, and government, e.g. Industry Training Advisory Board (ITAB) officers, community of practice;
- Strong foundation with infrastructure (TAFE's and Universities) dedicated to training.

### **WEAKNESSES**

- Lack of training culture and commitment to training by Industry;
- Poor perception by Industry of training providers;
- Training pathways and packages (and training jargon) impenetrable to Industry participants;
- Inconsistent training framework across government (state and federal) and across Industry;
- University Aquaculture graduates have unrealistic expectations of employment (level and scope) in the Industry;
- University Aquaculture courses lack business and administration content needed to up skill Industry managers;
- Training providers appear unresponsive to Industry needs (flexibility, course content);
- Industry largely unaware of current government initiatives (e.g. training incentives);
- Government and Industry do not interact to the extent that training policy/programs reflect Industry needs.

## OPPORTUNITIES

- Harness social and intellectual capital in the Industry through identifying and supporting Industry champions to promote training opportunities;
- Focus training programs (and University courses) to Industry needs;
- Raise the profile of Industry and training by aligning Industry and government aspirations;
- Introduce uniform training pathways/recognition/incentives across states;
- Develop training pathways based on existing Industry-based initiatives (e.g. Leadership program) and integrate with University courses;
- Develop specialist intensive courses aligned to Industry need (e.g. aquatic animal health, biotechnology) by linking current capacity (e.g. Australian animal health laboratory) to appropriate training providers (but avoid wasteful replication in capacity);
- Develop greater business and management content in Aquaculture degree programs aligned to Industry needs;
- Combine with rural sectors in training, e.g. food safety, environmental management systems, financial management, agribusiness, business management, marketing.

## THREATS

- Loss of individuals with profound knowledge of Industry and Government processes relevant to the Aquaculture industry (e.g. closure of ITABs);
- Continued lack of responsiveness by government and training providers to Industry needs;
- Uncertainty of funding programs (e.g. Farmbi\$);
- Geographical spread of Industry and access to appropriate training facilities;
- Fragmentation in Industry and mixed messages sent to government and other stakeholders;
- Continued lack of job opportunities to match training outcomes in indigenous communities;
- Seasonality of production makes it difficult to hold experienced casual or semi-skilled staff.

The focus group then addressed some key issues. The response of the focus group participants is presented below.

## **WHAT ARE THE TRENDS AND INFLUENCES, WHICH YOU EXPECT TO IMPACT ON AQUACULTURE ENTERPRISES IN THE MID-TERM (IMPENDING CHANGES AND OPPORTUNITIES)?**

The focus group participants identified the following trends and influences:

- Increased demand;
- Increased disease risk;
- Bio-technology (genetics);
- Changing consumer preferences;
- More responsibility for people in the workplace (e.g. OH&S);
- Environmental concerns (about Aquaculture operations);
- Triple bottom line (Social, economic and environmental) integration;
- Quarantine issues (current inadequacies);
- Over supply (of aquaculture product);
- Government influences/strategies (changing policy, legislation);
- Increasing regulatory environment (related to above but including local government);
- Marketing (need to compete on global markets);
- Natural resource pressures/impacts (resource allocation issues);
- Niche markets & mergers (focus for marketing and Industry development);
- Increased technology (to improve efficiency and increase production);
- Limited access to space (particularly for sea-based farms).

## **WHAT WILL BE THE NATURE OF THE WORK?**

Focus groups identified the following changes to the work place towards 2010:

- More mechanisation so less physical work and fewer workers;
- More technology including biotechnology requiring increased understanding of technology;
- Improved efficiency and more streamlined operations;
- Safer workplace as increased emphasis on OH& S;
- Aquaculture will become an industry of choice (i.e. career path opportunities);
- More casual work/job sharing/more younger people;
- Competition amongst industries to secure the new entrants – as aging population, so need to find a way of encouraging the young into the industry;
- Greater flexibility in working hours;
- Improved quality of life;

- Increased emphasis on food safety and quality;
- More worker/team input across, between and within Industry.

### **WHAT DO YOU THINK THE OPERATION WILL LOOK LIKE IN 5 YEARS TIME?**

The focus group participants were asked to speculate on how Aquaculture operations will be structured in the future. They identified the following:

- Bigger operations – i.e. satellite farms resourced by a “parent” company, this is viewed as a positive direction for the long-term success of the Industry;
- More strategic approach;
- Species diversification (niche products);
- Growth and expansion;
- Environmentally sustainable/ friendly with a positive impact (clean green);
- Leaders in the community, providing a positive input into the community (put back into the community);
- High standards including quality;
- More international involvement i.e. Australia to overseas and vice-versa for species and technology- swap knowledge;
- Exchanges amongst workplaces both interstate and overseas.

### **WHAT STANDARDS ARE YOU AIMING AT?**

The focus group participants identified the following standards as aspirations in the Industry:

- Industry leadership
- Quality and safe products: promote clean green image as point of differentiation;
- Motivated and happy content staff – personal growth;
- Community and social values and standards;
- Industry codes of practice.

### **WHAT VALUES DOES THE ORGANISATION BELIEVE IN?**

The focus group participants identified the following values as representative of the Australian Aquaculture Industry. These findings also reflect the standards identified above.

- Environmental awareness;
- Safety and quality;
- Put back into the community;
- Industry leadership and teamwork;

- Personal and business integrity;
- Social values;
- Respect for others;
- Work ethics;
- Innovation and creativity.

## **WHAT ARE THE DESIRED SKILLS/KNOWLEDGE FOR ORGANISATIONAL SUCCESS?**

The focus group participants identified the following skills, knowledge. These findings form the basis of consideration for training and education in the Aquaculture Industry towards 2010:

- Need for leadership;
- Succession planning;
- Market direction/skills;
- Risk assessment;
- Entrepreneurial skills;
- Learn from others mistakes;
- Strategic planning;
- Personal communication /people skills;
- Confidence building of individuals = effectiveness;
- Pond culture techniques;
- Maximising production;
- Dealing with seasonal fluctuations;
- HR management & middle management development to teach, coach, mentor;
- Problem solving;
- Business skills;
- Devolution of empowerment;
- Ownership of process;

- Strong team and problem solving skills;
- HACCP<sup>10</sup>;
- Disease management.

Note the emphasis on human capital development in the Aquaculture industry. Few of the identified skills aligned to traditional educational and training emphases on biology and intensive rearing systems.

*“The focus group meeting was great. I came looking for greater accountability for training providers and left optimistic that Industry needs would be met in the future. The Seafood Industry Training Package offers much to the Aquaculture Industry but improved communication among all involved is needed particularly in recognising the time commitment in training. Getting around the table in the focus group to explore better ways of getting busy Industry people trained was very worthwhile for me”*

Colin Eagle, Australian Fishing Enterprises, Port Lincoln.

## **WHAT WOULD OCCUR IF GOVERNMENT SUPPORT FOR TRAINING AND EDUCATION WERE NO LONGER AVAILABLE?**

The focus group participants were asked to speculate on the impact of reduced government support for training. The following impacts were identified:

- Not as many trainees going through;
- Presently it aids to free up company dollars to put into other training or improvements in the organisation;
- Short-term courses with little impact on business aimed at specific sectors i.e. new technologies;
- Key to industry remote and rural promotion;
- Industry should provide feedback to government on how the funding aided staff i.e. we got this funding and here are the good news stories from that – Provide government with outcomes and results;
- Make some comparisons to the available training and the resulting jobs;

---

<sup>10</sup> Hazard analysis and critical control point. Used to manage food safety.

## CAREER PATHWAYS AND EDUCATION/TRAINING OPPORTUNITIES

The Seafood Industry Training Package (SITP) offers flexibility in tailoring training to suit the needs of the individual and the aquaculture enterprise. Some examples follow adapted from the Users guide to the Seafood Training Package<sup>11</sup>. The four core units are embedded across the pathway from Certificate 1 to Diploma in the Seafood Industry (Aquaculture) i.e. Apply Basic Seafood Handling & Safety Practices; Communicate in the Seafood Industry; Work Effectively in the Seafood Industry; and Meet Workplace OH & S Requirements. Thus for a Diploma a trainee needs to complete an additional 19 units to fulfil the requirement of 23 units as shown below. Importantly, entry is available at any level (i.e. from Cert 1 through to Diploma).



The flexibility and versatility in the SITP is illustrated by the following case studies adapted from the Users guide published by Seafood Training Australia April 2004. In particular, the following profiles demonstrate how training can be tailored to the requirements of the particular Industry or the needs of the trainee.

### PROFILE ONE

#### *ANNE – Employed as a Farm Hand in Salmon Aquaculture*

Anne had always loved the sea and in particular fish. All her life Anne had wanted to work with fish and decided that when she left school the aquaculture industry was where she wanted to be, the diversity of the aquaculture industry appealed greatly to Anne, and she could see a clear future for herself in one day owning her own aquaculture farm. While Anne was still at school she undertook a certificate I in Seafood Industry (Aquaculture) while in year 11 and 12 as a school-based traineeship. Fortunately for Anne when she left school she was employed by a local salmon farm and offered a traineeship on a New Apprenticeship Scheme to undertake the certificate II in the Seafood Industry (aquaculture SFI120104) by one of the local Salmon farms.

As Anne's vision for her future was based on owning her own aquaculture farm, she wanted to include in her traineeship some units of competency that would give her some business skills. A registered training provider (RTO) was able to help Anne select units of competency that would lead to her fulfilling her dream of one day owning her own aquaculture business.

<sup>11</sup> Users guide published by Seafood Training Australia April 2004. Profiles adapted from those prepared by Barb McPherson.

<p><b>QUALIFICATION</b></p> <p><b>Packaging Rules</b></p>	<p><b>QUALIFICATION</b></p> <p><b>Certificate II in the Seafood Industry (Aquaculture)</b></p>	<p><b>Certificate I or III in the Seafood Industry (Aquaculture) - maximum 1 Unit from each level</b></p>	<p><b>Certificate II level or higher, from this or any other Training Package – maximum of 2 units</b></p>
<p><b>CORE (GROUP A)</b> 4 units</p>	<p><i>SFICORE101B</i> – Apply Basic Seafood Handling &amp; Safety Practices</p> <p><i>SFICORE103B</i> -Communicate in the Seafood Industry</p> <p><i>SFICORE105A</i> – Work Effectively in the Seafood Industry</p> <p><i>SFICORE106A</i> – Meet Workplace OH &amp; S Requirements</p>		
<p><b>SPECIALIST (GROUP B)</b> 7 units</p>	<p><i>SFIAQUA213B</i> – Monitor Stock &amp; Environmental Conditions</p> <p><i>SFIAQUA205B</i> – Feed Stock</p> <p><i>SFIAQUA206B</i> – Handle Stock</p> <p><i>SFIAQUA215A</i> – Carry out on-farm post-harvest Operations</p> <p><i>SFIFISH209B</i> – Maintain the Temperature of Seafood</p> <p><i>SFISTOR201B</i> – Prepare &amp; Pack Stock for Live Transport</p> <p><i>SFIAQUA214A</i> – Produce algal and/or Live-feed Cultures</p>		
<p><b>ELECTIVE (GROUP E)</b> 8 electives</p>	<p><i>HLTFA1A</i> – Apply Basic First Aid</p> <p><i>FDFCORQAS2A</i> – Implement Quality Systems &amp; Procedures</p> <p><i>BSBCMN205A</i> – Use Business Technology</p> <p><i>BSBCMN206A</i> – Process &amp; Maintain Workplace Information</p> <p><i>BSBCMN207A</i> – Prepare &amp; Process Financial/ Business Documents</p> <p><i>BSBCMN208A</i> – Deliver Service to Customers</p> <p><i>BSBCMN209A</i> – Provide Information to Clients</p>	<p><i>BSBRKG304A</i> – Maintain Business Records</p>	

## **PROFILE TWO**

### ***JOHNNY – Leading Hand***

Johnny had been working on a pearl farm for two years and had recently been promoted to leading hand in charge of the small fleet of “dinghies”. Johnny had previously undertaken a certificate II in the Seafood Industry (Aquaculture SFI120104) and his boss now wanted him to undertake the certificate III in the Seafood Industry (Aquaculture SFI30104) and obtain his coxswains ticket. Johnny had built up his sea time over the last year and as he wanted to further his career decided to undertake the Certificate III, which would give him the competencies required to gain his coxswain certificate of competency.

Prior to Johnny undertaking the certificate III, his boss checked with the local marine authorities that the units that Johnny selected for the coxswain certificate of competency were approved. When undertaking the Certificate III in the Seafood Industry (Aquaculture) Johnny noted that two options were available: -

Option One was to complete all units from the Coxswain group and Option 2 was to select 9 elective units from a combination of: Group B aquaculture units not already selected, group E electives, Certificate II or IV Seafood Industry (Aquaculture) a maximum of 1 unit Certificate II level or higher, from this or any other Training Package – maximum of 2 units. Units marked with a ✓ were completed when Johnny undertook the Certificate II in the Seafood Industry (Aquaculture). As Johnny wanted to get a coxswain certificate he opted for Option one.

<b>QUALIFICATION</b>  Packaging Rules	<b>QUALIFICATION</b>  Certificate III in the Seafood Industry (Aquaculture)
<b>CORE (GROUP A)</b>  4 units	<p><i>SFICORE101B</i> – Apply Basic Seafood Handling &amp; Safety Practices ✓</p> <p><i>SFICORE103B</i> -Communicate in the Seafood Industry ✓</p> <p><i>SFICORE105A</i> – Work Effectively in the Seafood Industry ✓</p> <p><i>SFICORE106A</i> – Meet Workplace OH &amp; S Requirements ✓</p>
<b>SPECIALIST (GROUP B)</b>  8 units	<p><i>RTC3805A</i> – Coordinate worksite activities</p> <p><i>SFIAQUA309B</i> – Oversee harvest &amp; post harvest activities</p> <p><i>SFIAQUA312A</i> – Oversee the control of pests, predators &amp; disease</p> <p><i>SFIFISH209B</i> – Maintain the temperature of seafood ✓</p> <p><i>SFIOHS301B</i> –Implement OHS policies &amp; guidelines</p> <p><i>SFISHIP209B</i> – Operate marine communications equipment (pre-requisite for coxswain)</p> <p><i>SFISHIP212B</i> – Take emergency action on board a vessel (pre-requisite for coxswain)</p> <p><i>SFISTOR201B</i> – Prepare and pack stock for live transport ✓</p>
<b>OPTION 1 – (GROUP R)</b>  All units  (Necessary to attain coxswain certificate of competency)	<p><i>TDMMB601A</i> Monitor condition &amp; seaworthiness of a small vessel</p> <p><i>TDMMC701B</i> Apply seamanship skills &amp; techniques when operating a small domestic vessel</p> <p><i>TDMMC901B</i> – Manoeuvre a domestic vessel of less than 12 meters in length operating within inshore limits</p> <p><i>TDMME101A</i> Understand orders &amp; be understood in relation to shipboard duties</p> <p><i>TDMMF1001A</i> Provide first aid</p> <p><i>TDMMF3201B</i> Apply domestic regulations when operating a small vessel</p> <p><i>TDMMH1202A</i> Plan and navigate a short voyage within inshore limits</p> <p><i>TDMMR3001A</i> Operate &amp; carry out basic service checks on small vessel marine propulsion systems</p> <p><i>TDMMR3101A</i> Operate &amp; carry out basic servicing on auxiliary systems</p> <p><i>TDMMR3201A</i> Operate &amp; carry out basic routine servicing of marine extra low &amp; low voltage electrical systems</p> <p><i>TDMMR5402A</i> Carry out refueling &amp; fuel transfer operations</p> <p><i>TDMMU502A</i> Ensure compliance with environmental considerations in a small domestic vessel</p>

## **PROFILE THREE**

### ***DAVID - Supervisor at a Prawn Farm***

David was originally employed on the prawn farm as a farm hand and has steadily worked his way through the ranks to become a supervisor on the farm. Although David has been working on the farm for several years he has never undertaken any formal training. However with his new supervisory role, which sees him responsible for the day-to day running of the operation as well as administrative duties and food safety responsibilities, David feels it is important to have some formal qualification. In order to upgrade his skills in these areas David and his employer decided that he should undertake the Certificate IV in the Seafood Industry (Aquaculture, SF140104). David contacts a local RTO, registered to deliver the Certificate IV to discuss his options.

<p><b>QUALIFICATION</b></p> <p><b>Packaging Rules</b></p>	<p><b>QUALIFICATION</b></p> <p><b>Certificate IV in the Seafood Industry (Aquaculture)</b></p>	<p><b>Certificate III or Diploma in the Seafood Industry (Aquaculture) - maximum 1 Unit from each level</b></p>	<p><b>Certificate IV level or higher, from this or any other Training Package – maximum of 2 units</b></p>
<p><b>CORE (GROUP A)</b></p> <p><b>4 units</b></p>	<p><i>SFICORE101B</i> – Apply Basic Seafood Handling &amp; Safety Practices</p> <p><i>SFICORE103B</i> -Communicate in the Seafood Industry</p> <p><i>SFICORE105A</i> – Work Effectively in the Seafood Industry</p> <p><i>SFICORE106A</i> – Meet Workplace OH &amp; S Requirements</p>		
<p><b>SPECIALIST (GROUP B)</b></p> <p><b>5 units</b></p>	<p><i>RTC4908A</i> –Supervise work routines and staff performance</p> <p><i>SFIAQUA401B</i> – Develop &amp; implement a stock health program</p> <p><i>SFIAQUA407B</i> – Coordinate sustainable aquaculture practices</p> <p><i>SFIAQUA408B</i> - Supervise harvest &amp; post-harvest activities</p> <p><i>SFIAQUA409A</i> – Implement, monitor &amp; review stock production</p>		
<p><b>ELECTIVE (GROUP E)</b></p> <p><b>12 electives</b></p>	<p><i>RTC4911A</i> – Operate within a budget framework</p> <p><i>MTMMP77B</i> – Participate in a product recall</p> <p><i>MTMPSR406A</i> – Manage &amp; maintain a food safety plan</p> <p><i>BSBADM408A</i> – Prepare financial reports</p> <p><i>BSBCM407A</i> – Coordinate business resources</p> <p><i>BSBCM404A</i> – Develop teams &amp; individuals</p> <p><i>BSBFLM404A</i> – Lead work teams</p> <p><i>BSBMGT502A</i> – Manage people performance</p> <p><i>BSBSBM406A</i> – Manage finances</p>	<p><i>FDFCORQAS2A</i> – Implement quality systems &amp; procedures</p> <p><i>FDFCORFSY2A</i> – Implement the food safety program and procedures</p>	<p><i>BSBHR504A</i> - Manage industrial relations policies &amp; processes</p>

## **PROFILE FOUR**

### ***REBECCA – Operations Manager on a Tuna Farm***

Rebecca has worked in the aquaculture industry for the last 12 years and her current position is as operations manager of a tuna farm. Rebecca recognises the need to ensure sustainable development of the industry and is interested in undertaking a diploma in the Seafood Industry (Aquaculture, SFI50104) to aid her in implementing sustainable practices in her business. Rebecca contacted an RTO that helped her map out relevant units of competency that would help her in developing environmental management policies within her business.

<b>QUALIFICATION</b>  Packaging Rules	<b>QUALIFICATION</b>  Diploma in the Seafood Industry (Aquaculture)	Certificate IV in Seafood Industry (Aquaculture) - maximum 1 Unit	Diploma level or higher, from this or any other Training Package – maximum of 2 units
<b>CORE (GROUP A)</b>  4 units	SFICORE101B – Apply Basic Seafood Handling & Safety Practices SFICORE103B -Communicate in the Seafood Industry SFICORE105A – Work Effectively in the Seafood Industry SFICORE106A – Meet Workplace OH & S Requirements		
<b>SPECIALIST (GROUP B)</b>  5 units	BSBMGT609A – Manage risk RTE6501A – Manage the production system SFIAQAU405B – Develop emergency procedures for an aquaculture enterprise SFIAQUA407B – Coordinate sustainable aquacultural practices SFIAQUA504B – Plan ecologically sustainable aquacultural practices		
<b>ELECTIVE (GROUP E)</b>  14 electives	RTE5516A – Develop a whole farm plan RTE5903A – Plan, implement & review a quality assurance program MTMPS5603A – Develop, manage & maintain quality systems BSBHR504A – Manage industrial relations policies & processes BSBSBM405A – Monitor & manage business operations BSBATSIC411A – Communicate with the community BSBFLM509A – Promote continuous improvement BSBFLM510A – Facilitate & capitalise on change & innovation BSBMGT507A – Manage environmental performance BSBMGT601A – Contribute to strategic direction BSBMGT610A – Manage environmental management systems SFILEAD501B – Develop & promote industry knowledge SFILEAD504B – Plan & achieve change & results SFILEAD506B – Provide corporate leadership		

**PROFILE FIVE**

**Selina – Aquaculture Entrepreneur**

Selina had worked for many years on a prawn farm progressing from farm hand to manager within five years. During that time she had completed a Diploma in the Seafood Industry (Aquaculture) choosing business and environmental management electives, as she was keen to get additional skills in these areas. Selina wanted to start her own business and saw potential in applying her practical knowledge of the Aquaculture industry in her own business venture. She noticed a University course offering credit for effectively one year of a degree program. Even better, Selina found that she could study part time while continuing her work as a prawn farm manager. Selina chose business and biotechnology electives in her Bachelor of Science degree program building on core units (including aquatic microbiology, intensive rearing systems and aquatic animal health). She found it particularly useful to network with researchers in the field of biotechnology, which aligned with her interest in sponge aquaculture. Soon after finishing her degree, which she was able to complete promptly with intensive short courses offered by the University, Selina has started her own business in sponge aquaculture servicing the growing marine bioproducts industry.

<p><b>QUALIFICATION</b> <b>Packaging Rules</b></p>	<p><b>QUALIFICATION</b> <b>Qualification BSc (Aquaculture)</b></p>
<p>45 Unit Credits for Diploma in the Seafood Industry (Aquaculture)</p>	
<p>Selina needed Chemistry training to progress to advanced units and she elected to take a first year subject. Other subjects are elective 2<sup>nd</sup> year units credited to a BSc</p>	<p>Technology for Aquaculture General Microbiology Aquatic Environmental Management Aquaculture Economics and Policy Aquaculture systems design Chemistry</p>
<p>Selina decided to take the optional study tour to Japan to get first hand exposure to intensive rearing systems. This was credited as a third year unit. All other units are elective 3<sup>rd</sup> year units credited to a BSc.</p>	<p>Advanced Aquaculture Technology Aquaculture health management Aquaculture genetics and Biotechnology Aquaculture field experience Aquaculture business and law Aquaculture study tour Business planning</p>

## CULTURALLY APPROPRIATE EDUCATION AND TRAINING MODELS FOR INDIGENOUS AUSTRALIANS

There are opportunities for greater Indigenous participation in aquaculture particularly in regional coastal communities where there is a history of seafood harvest. Points emerging from the consultation undertaken, a report on the North Queensland Indigenous Aquaculture Working Group (see Appendix 4), and surveys completed include:

- The indigenous sector is overtrained with participation in training disproportionate to the job outcomes in the Aquaculture industry for indigenous people;
- Training linked to actual aquaculture enterprises needs to take into account Indigenous needs including:
  - recognising the fundamental link to the community and to the land;
  - aligning the enterprise to take into account capacity of the community (e.g. not demanding of technology);
  - involvement with the grass roots;
  - caring for the land and the sea.
- Success is more likely to come from tried and proven species (and technology);
- Access to established facilities or assistance in the development of model farms should be encouraged to develop practical skills;
- Development of Aquaculture opportunities should recognise, and allow for supply chain issues in remote communities (e.g. lack of processing and product storage facilities);
- Capacity for Indigenous community engagement in Aquaculture could be encouraged by by recognising and training leaders to work within the mainstream framework;
- Although there was lack of awareness of current leadership training opportunities (and the SITP more generally) there was much interest expressed by potential indigenous participants (North Queensland Indigenous Aquaculture Forum);
- There is a need to reduce red tape and bureaucratic inertia which is seen by Indigenous participants to be retarding real outcomes in building aquaculture enterprises;
- Skills development is needed in the following areas:
  - Business planning;
  - Leadership;
  - Familiarisation with regulatory framework and government;
  - Access to industry to “see and do” before committing to a project;

- Work experiences programs;
- Technical skills learnt on the job.
- Trainers need training in cultural awareness relevant to Indigenous communities.

Remarkably, many of the issues presented above in relation to Indigenous training opportunities were similar to those raised by Industry through the Focus group discussions and Industry consultation/surveys. In particular, the general lack of awareness and engagement with the SITP, the need for training providers responsive to Industry needs, and the involvement with the grass roots are recurrent themes.

The case studies presented below offer examples of successful Indigenous Aquaculture enterprises. They reinforce the needs described above.

### **CASE STUDY 1:**

#### **Snowy River Native Fish Hatchery (SRNFH), Orbost, Victoria**

An ex-sawmill building was converted into an indoor, heated production facility for ornamental and native finfish species in 2001. Initial attempts at training were *ad hoc* although at least three participants were awarded their Certificate II in Aquaculture in early 2003 from the East Gippsland TAFE.

Workplace-based training began with the National Aquaculture Training Institute (auspiced by RTO Northern Melbourne Institute of TAFE) in mid 2003. Significant funds were sourced through the Farmbi\$ program to allow fortnightly visits by trainers and assessors.

A total of eleven Indigenous people have participated in the program with the following outcomes:

- Four candidates will complete their Certificate III by July 2004;
- Another four are likely to complete by September 2004;
- Three participants have moved to other employment without completing the training;
- Currently, all eight managers/owners and workers at SRNFH are enrolled in the SITP;
- It is expected that three candidates will be well into their Certificate IV or Diploma by the end of 2004. They have indicated a willingness to work hard to complete their qualifications in 2005.
- Opportunities for funds (capital) for the establishment of satellite business for individuals or two people are currently being explored. This includes the development of a comprehensive business plan with support from the Koori Business Network;
- The workplace training has resulted in significant improvements in a number of areas including:
  - Numbers of production tanks;

- Variety of species production and numbers of juveniles sold;
- Growth rates and survival rates;
- Food Conversion Ratios (FCRs);
- Lowering of OH&S risks and other risk or hazardous incidents.

The success of the training can also be seen in worker attitudes with absenteeism and sick days being reduced. After-hours and weekend work is also being completed.

The owner-managers of the business are very pleased with the progress of their own professional development as well as their workers. They have also organised and run cultural awareness training for NATI trainers and assessors.

## **CASE STUDY 2:**

### **Nalta Ruwe Yabby Farm, Berri, S.A.**

This 5ha facility located at the Gerard Aboriginal Community was designed and built by non-Aquaculture consultants in the early 1980's. Hence, poor site selection (350m head to pump water from the Murray River, low clay content in the soils, away from town water and other utilities) meant that much of the funds were wasted. Whilst there were some selling yabbies for a time, the Gerard Community Aquaculture Project ended in 1987.

In 1995 the Nalta Ruwe Aboriginal Corporation, also known as the Riverland CDEP, recommenced the project. Nalta Ruwe encountered problems similar to those experienced by the Gerard Community i.e. poor pond design and a lack of capital funds.

The Aboriginal Land Trust SA owns the Gerard Lands. The responsibility for the day-to-day operations, approximately 9000 acres of land, is that of the Gerard Council. Nalta Ruwe has a lease agreement with the Gerard Council of about 300 acres and which also includes the yabbie farm. The lease is for a time of 25 years with the right of renewal.

Although significant capital infrastructure improvements have been made since then, there are still too few useable ponds.

A work crew of seven operated the farm for much of the late 1990's and six of these 'experienced people' were enrolled in the SITP Certificate II through the Murray Institute of TAFE (MIT). All completed this in 2001. Then MIT employed National Aquaculture Training Institute freshwater crayfish specialists to undertake training and assessment for higher level certificates.

To date, the following benefits have occurred to the business:

- Opening up of a new market through bait sale;
- Preparation of a food safety plan;

- Graduation of five of the experienced workers in Certificate III, another two will complete their assessments before the end of July 2004;
- Four of the original five graduates have rolled onto higher qualifications, with four undertaking Certificate IV and two (including an ex-manager who has been re-employed by the group) are enrolled in the Diploma (it is expected that by the end of 2004, all of the candidates will have completed more than half of their competency units, and will graduate before the end of 2005).

Again, access to Farmbi\$ funds was a key success factor due to the additional requirements of the training and assessment program. This includes fortnightly visits by NATI trainers and assessors. Some funds were also contributed to consumables and small but key pieces of equipment, e.g. air blower.

Due to poor pond construction and design, only a few (0.5ha) could be utilised for yabby production. Part of an ex-hatchery (buried tunnel) has been upgraded to allow the production of ornamental fish that require a higher level of husbandry skills than those for yabbies.

The group have worked on funding proposals for upgrading the facility and have completed over 50 standard operating procedures (SOPs) for their operation.

### **CASE STUDY 3:**

#### **Cobowra CDEP Traineeships in Oyster Farming in Southern New South Wales**

A total of eleven trainees from Cobowra CDEP enrolled in a Certificate 2 in the Seafood Industry (Aquaculture) in 2000. Notably, this program was one of the first to adopt the SITP. Of the eleven trainees two were placed with NSW Fisheries. The rest were placed with four oyster growers on the Clyde River and one oyster grower in an estuary to the south. Eight trainees successfully completed the traineeship and were issued their certificates by the Australian Maritime College in 2000/2001.

Other successful outcomes included:

- two trainees have ongoing full time employment with their original host employees;
- one trainee with NSW Fisheries found immediate employment with Parks and Wildlife at the completion of her traineeship;
- Only one trainee who commenced with the host employer failed to complete the year;
- The program has led to further intakes of trainees based on the initial success;
- Currently (2004) 12 people originally from the Cobowra CDEP who completed the certificate 2 in Aquaculture are in full time employment or traineeships with the oyster growers of the region;
- Some Certificate 2 trainees have progressed to Certificate 3;

- Of the original group of host employers, all remain involved with the program either providing full time employment for completed trainees or hosting new trainees.

#### **CASE STUDY 4:**

##### **Sector Specific Training to Aboriginal Communities in WA**

Fisheries WA and the Kimberley and Pilbara Region TAFE colleges are committed to offering aquaculture-based training programs to Aboriginal communities in the northern region of WA. The Kimberley Aquaculture Aboriginal Corporation has received funding to support a *Trochus* reseeding program and accompanying training program at King Sound. In support of this Fisheries WA has established a *Trochus* hatchery at One Arm Point.

The Kimberley College of TAFE has developed a Cert I in Aquaculture predominantly for the aboriginal communities who have applied for licences.

The WA TAFEs cited above also offer sector-specific training to the Pearling Industry.

#### **LESSONS LEARNT FROM THE CASE STUDIES IN INDIGENOUS TRAINING**

Key characteristics for the success of the projects described above include:

- Significant capital infrastructure was already in place such that training could be immediately applied in the workplace;
- Managers involved in the process took an interest in progressing their staff and using the project for developing self confidence in them;
- There was high trainer awareness of social, economic and cultural issues associated with Indigenous people;
- Training was undertaken at the work place resulting in real work outcomes;
- Participants were supported financially (by Ab-study or on a CDEP placement). Funding by Farmbi\$ allowed good quality trainers to be brought in from interstate (Tasmania and South Australia). These funds were also used for paying for training facilities and learning resources, lunches and snacks for the participants, as well as petrol for a person to pick up the workers without a car;
- Experienced trainers were used. These trainers had run or operated small-scale Aquaculture businesses and could impart real world practical knowledge. Regular and routine visits by the trainers tied in with learning outcomes leading to on-the-job improvements;
- Trainees need to be within commuting distance of home. Trainees having to relocate tend not to complete;
- Small numbers of trainees allocated per host employer. Bulk placements have been less successful;
- Younger trainees tend to have higher completion rates than older individuals.

## GOOD PRACTICE MODELS OF TRAINING

### STRATEGIC PLANS FOR THE AQUACULTURE SECTOR

Most states produced strategic plans for the development and application of training aligned to the needs of the Seafood Industry in that state. The plans were developed by the Industry Training Advisory Boards (ITABs) from 1999 to 2001 and therefore have varying relevance to current Industry needs and government programs. In particular, the disbanding of ITABs has implications for the relevance of the plans produced.

Current issues arising from the strategic plans include:

- there is generally a thin market for aquaculture training as individual sectors require specific attention reflecting their needs;
- new seafood safety standards and legislation (now introduced) require integration into current training programs;
- Industry has been slow to take on trainees, with Industry preferring to hand pick appropriately qualified (or certified) staff (e.g. with Coxswains, Fork Lift, Commercial diver);
- Registered Training Organisations (RTOs) need to be demonstrably more responsive to Industry needs;
- Development of a network of Industry trainers and assessors to:
  - Reduce costs;
  - Increase accessibility;
  - Increase flexibility;
  - Develop a training culture within industry;
  - Increase the viability of training in the context of a thin market.
- Facilitating “on the job” training.

Industry trends (in training and education needs) identified in the strategic plans which are still relevant (as evident from the Industry survey results) include:

- increased emphasis on business (especially small business) and administration;
- increased government regulations applicable to food safety, occupational health and safety, environmental impact, and product quality;
- increased aquaculture harvest;
- greater emphasis on the supply chain and its management.

The survey results indicated that Industry sectors generally consider training providers to be unresponsive to Industry needs. However, these perspectives tend to relate to negative experiences with specific training providers. Consultation with Industry during this project revealed that some training providers are responsive. One example of this is the Community of Practice described below as a case study. Here training providers engage one another to seek and apply better training models in the Aquaculture Industry.

## **TRAINER'S CASE STUDY:**

### **Trainer's case study – Seafood Trainers Community of Practice<sup>12</sup>.**

The Australian National Training Authority (ANTA) funded the project to engage and empower a community of aquaculture trainers from around Australia was initiated in mid 2003. The project saw the establishment of a network of trainers from around Australia working cooperatively to improve training and assessment outcomes for the seafood industry.

The Seafood Trainers' Community of Practice has successfully engaged the majority of training providers delivering aquaculture training in Australia in an active and inclusive Community that continues to evolve to meet individual and shared needs. Members voluntarily interact for professional development, sharing of ideas and resources, and collaborative development of assessment support materials, participating in the activities of the Community according to current needs.

The work of the Community has involved the collaborative development of resources, to meet an identified need for materials to support the uptake of training in the aquaculture sector. But while the Community exhibits a high degree of cooperation and goodwill, collaboration on the development of materials has not occurred spontaneously, with varying success in engaging members of the Community to 'do the work'.

It is acknowledged that the success of Communities of Practice is dependent on the quality of social capital that is generated and accessed by the community. Three important aspects of social capital that are vital are trust, bridging (or networking) and bonding.

## **Introduction**

Training providers are geographically dispersed and many are new to the Aquaculture sector, and lack local networks. Training uptake in Industry is also in the absence of assessment materials for aquaculture units and qualifications beyond Certificate II.

During 2003-2004 Seafood Training Australia managed a project that enabled trainers from around the country to use their collective capacity to develop resources to support training for aquaculture enterprises. This collective work became the vehicle for a Community of practice that reached across State and Territory and organisational borders.

---

<sup>12</sup> extracted from the case study prepared by Jo-Anne Ruscoe "Empowering a community of practice to develop support materials"

The project addressed two aims:

Support the development of a mature, active Community of Practice of aquaculture trainers and assessors

Cooperative development of assessment and other resources to support delivery of level III and above aquaculture qualifications in the Seafood Industry Training Package.

The project sought to achieve these aims through empowering a network of trainers to function as a Community of Practice, and utilising the collective capability of the Community to develop support resources.

Participants agreed that the main benefits of becoming active in the Community would include:

**For trainers and assessors:**

- Empowerment through advice and support, and an increase in skills and knowledge;
- Recognition of, and support for, the professional development needs of trainers and assessors;
- Access to cost-effective resources;
- Opportunity for peer and industry review of support materials and assessment tools to ensure continual improvement of service delivery;
- Increased acceptance of training within the seafood industry should lead to increased opportunities;
- Commitment by training service providers toward continual improvement of delivery and assessment tools and processes;
- Sharing of stories to lessen the feeling of isolation and stress among trainers.

**For training providers the benefits are:**

- The commercial advantage associated with staff belonging to a group that demonstrates a commitment to continual improvement;
- Increased acceptance of training within the seafood industry should lead to increased opportunities;
- The implementation of peer and industry review and 'moderation' of assessment materials will assist organisations to satisfy audit requirements;
- The opportunity for cost-effective and relevant professional development was perceived as a major factor for acceptance ;
- Mentoring and support of new trainers/assessors by the Community;

- Moderation/peer and industry review ensures continual improvement of assessment processes;
- Cost effective access to resources- while participants work on a selected suite of components, since access is available to the whole suite developed by the larger community leading to increased capability;
- Membership and linkages may strengthen future funding applications.

It was evident that participants had a well-developed sense of responsibility towards the Industry and learners, and shared a vision for improved services to Industry and other clients. It was agreed that Industry is likely to benefit from this project through:

- Commitment by training service providers toward continuous improvement of tools and assessment processes;
- Increased confidence that assessment standards and processes are reliable, and that service providers have made a commitment toward quality and improvement.

These benefits are important in the context of Industry cynicism towards training providers identified through the current project.

As the Community is quite large and dispersed, in order to develop the assessment resources, it was agreed that trainers and assessors from the Community would self-select into working or 'task' groups to work with the project coordinator and consultant in the specified activities. The degree of involvement was according to individual choice, and members elected to devote time and energy to those components that were of immediate value to them.

The following roles for the Community were suggested and supported by the task groups:

- Volunteer examples of 'good practice' assessment tools;
- Review existing materials and provide feedback;
- Assist in the design of templates, and develop level III assessment plans individually or in teams;
- Other members not directly involved in writing to review and endorse templates and materials Questionnaires rather than open-ended feedback to be used;
- Sub-groups of assessors to trial assessment materials and provide feedback;
- Work with the project coordinator to develop and trial the Recognition kit.

## Professional Development

The importance of professional development to members and to the overall aims of the Community of Practice cannot be understated. Members see professional development as a way of securing management support of the Community's work and building individual and collective capacity.

During the development phase, Seafood Training Australia facilitated a successful Reframing the Future (RTF) staff development project, which assisted members to develop skill in resource design and development as a step towards their empowerment as a community to develop assessment materials. Learning activities aimed to develop;

- Greater consistency of approach in assessment;
- High standard of resource development skill and knowledge;
- Enhance capability in implementing the National Training Framework;
- Increased capacity to incorporate work-based approaches to training;
- New skills and knowledge to apply recognition processes particularly at the high Australian Qualification Framework (AQF) levels;
- Awareness of other resources.

## Industry Involvement

It was considered critical that Industry provided input in the development of the support materials to ensure relevance and reliability of assessment, and to raise awareness of the Community of Practice and its aims.

The close involvement of trainers associated with the National Aquaculture Training Institute network, meant that Industry members participated, both as farmers and as trainers (several had Cert IV Workplace Training and Assessment and were undertaking workplace training in the SITP). These people were able to add a great deal of value to the development of the resources.

Industry members who were approached to provide feedback on the materials represented the Pearl, Barramundi, Prawn, Salmon and Tuna farming sectors, and were identified through the following strategies:

- Trainer/Assessor suggestion;
- Current clients of members;
- Focus group participants.

## **Community of Practice Outcomes**

The two major aims of the Community of Practice (see above) have been largely achieved with the collaborative development, review and trial of the support materials. Seventeen out of twenty-nine major providers of vocational aquaculture training have been involved in the development of these resources, leading to a great awareness and acceptance.

Several RTOs are currently using the Certificate III and IV assessment tools and plans to assess candidates in the workplace or in simulated training situations. Trainers were able to customise the tools easily and the range of assessment tools met the needs of most assessment contexts. Many others plan to use these as the revised SITP is implemented by their organisations. It is recognised that the materials are of excellent quality and have been moderated by a national group of peers.

## **Expansion of Commercial Networks**

A new commercial network is being established to provide workplace training across a number of regional areas. This group plans to operate with local RTOs in the regions using as a centrepiece a "Whole-of-job assessment kit" for Certificate II to Diploma, which is strongly based on the Integrated Assessment Kit for Certificate III. This network will also customise and use the Community's assessment plans and tools. It is anticipated that this approach, while commercial in nature and not inclusive of all members, will lead to an enhanced awareness of workplace training among all RTOs and raised capacity for workplace training.

## **Recommendations for Engaging and Empowering a Community of Practice**

Recommendations arising from the Community of Practice are:

- Consider the likelihood of engagement realistically – Are individuals and training managers likely to support collaboration and actively engage in the project? Are there funding opportunities?
- Phone or meet with managers and explain the concept, follow up with a letter, and seek written expressions of support using a template letter/form and including a return paid envelope;
- Bring the potential group together early to discuss the idea of a Community of Practice;
- Encourage the participation of likely champions;
- Ensure those individuals 'at the coal face' attend. Ensure the group has shared concerns and experiences - minimise the attendance of other stakeholders in this initial stage. Ensure friendly and open facilitation by the potential project coordinator or 'driver'. Engage in some introductory and team building and activities;

- Develop a shared understanding of what a Community of Practice is, what are its benefits, and what are the pitfalls or potential problems?
- Recognise existing Communities of Practice – What purpose do they serve? What work do they do? Share a story about a community that helped you solve a problem, lead you to a contact or resources, or some other benefit;
- Discuss shared expectations of what a new Community of Practice can offer individuals and the larger group, and any other stakeholders;
- Encourage open discussion and exploration of concerns;
- Identify areas of priority need – support materials, professional development, discussion forums etc. Discuss openly and realistically the strengths, opportunities, threats and weaknesses of addressing these;
- Seek expressions of interest in participating in the Community of Practice;
- Develop an action plan to address shared priorities - Identify key individuals: champions, communicators, funding proposal writers, material designers, IT experts etc. Identify opportunities to meet face to face, and means of sharing information e.g. Resource Generator;
- Identify the professional development needs of the key individuals and the larger group, and seek means to address these quickly and efficiently;
- Group develops a code of conduct they can take ownership of;
- Champions set the example for collaboration and development of trust;
- Communicate regularly, but meaningfully, using a range of media according to activity at hand;
- If materials are being developed – Ensure they are designed to meet priority needs and encourage members' involvement in development work and peer review. Involve industry as much as possible and promote the work of the Community at all opportunities.
- Meet face-to-face as regularly as possible;
- Understand that there will be participants who don't contribute ('lurkers'), and look for opportunities to engage these people;

Note that the recommendations above in engaging training providers have relevance in similar recommendations presented below to engage the Aquaculture Industry in greater participation in constructive training activities.

## ASSESSORS CASE STUDY

Workplace training in Aquaculture has been compromised by the lack of experienced assessors to assess competencies against the provisions of the SITP. Aquaculture is a specialised application of the Australian Seafood Industry and the availability of experienced practitioners, particularly in the remote communities where many aquaculture enterprises are found, is limited. The Community of Practice model of information sharing among trainers will assist in development of appropriately qualified assessors. This is clearly needed to support workplace training and to reverse the general cynicism of Industry towards training providers.

In New Zealand, vocational training in the Seafood Industry is supported by a network of Assessors. These Assessors have responsibility for coordinating a network of subordinate assessors within their region. This works to centralise responsibility for Industry knowledge and contemporary assessment practices in a small pool of individuals. These individuals are responsible for passing on current developments (in workplace assessment, or different models of assessment) to the assessors within their region. This model is generally well accepted by the Industry and supports a high level of participation within the Seafood Industry in workplace training and assessment.

This model could be extended to the Australian Seafood Industry by building on the Community of Practice model to establish a regional network of Assessors. Such a network could be coordinated on a state by state basis i.e. each state has a Senior Assessor responsible for maintaining currency of workplace assessment practices. The Senior Assessor would then ensure that the workplace assessors in each state have a uniform system of workplace assessment responsive to the needs of the Aquaculture sectors in that state.

## LEADERSHIP DEVELOPMENT<sup>13</sup>

Currently, leadership in Australia's rural primary industries is predominantly based around the traditional "hero-leader" model. One person, usually an older male, has the leadership role in the community, organisation or industry. They are responsible for many aspects of policy and management, and the more involved they become, the less involvement there is from other members. In some situations this 'leader' takes on an almost mythical persona amongst grass roots members with them supporting this person without question and having no sense that they could ever do the job. Conversely, the 'hero leader' is a dominant, control driven individual who has no desire, nor skills to include, let alone empower others. This situation often results in people choosing not to continue their involvement. The 'hero leader' in this situation often describes the 'grass roots' members as apathetic and unwilling to participate, as a way of justifying their own power, position and control. These models often result in a culture of blame rather than responsibility and of control rather than inclusiveness.

---

<sup>13</sup> Adapted from "A New Model of Leadership Development in Rural Industries" by Cheryl Phillips and Martin Smallridge (draft report June 2004). See also "Development and delivery of a model for a National Seafood Industry Advanced Leadership Program" Final report to FRDC Project No 2000/307.

Both the Australian Seafood and Dairy Industries are going through a time of unprecedented change which is also having a multiplier effect on associated communities. The Seafood Industry is having to move from an inward-looking, isolated industry of individuals focussed on ensuring that there are enough fish for next year to an Industry which is open to public scrutiny and comment. The issues it now has to face are about sharing the resource with other sections of the community and ensuring that they meet community expectations and values in their operations. This is a dramatic shift for all members of Industry which has obvious parallels in the Aquaculture Industry.

Comparatively the dairy industry is operating in a newly deregulated market. A process through which all farmers are being exposed to market forces and having to deal with issues which have previously been artificially managed through price and quota regulation. The result of both processes has been major social upheaval and uncertainty, not only to Industry members but also to their associated communities.

While Industry leaders have been prime movers of many of these associated changes, the traditional leadership model has not been effective at bringing the Industry through the crisis and leaving it stronger and more clearly focussed.

It was this environment that spawned a partnership between the Seafood Council (South Australia) and Changing Industries (Cheryl Phillips<sup>14</sup>) resulting in a new model of leadership development being formulated. The model equates leadership with cultural change, it is about being dynamic as an Industry and being able to respond to issues as they arise and capitalise on opportunities. It is about ensuring that there are:

1. People who are committed to continuous improvement and prepared to contribute their skills, knowledge and networks for the good of the Industry,
2. Structures which offer pathways for involvement and support to Industry stakeholders, and
3. An enhanced leadership capacity in order to create a sustainable, progressive and professional industry.

Thus the model is concerned with leadership development not the training of leaders.

While it is believed that stakeholders from all sectors can develop leadership skills, two strategies have been implemented to ensure this is achieved. Firstly, the training needs were targeted appropriately and provided in a safe yet challenging environment. Secondly, the training was conducted within a context of cultural change with industry organisations developing strategic plans in a parallel process.

In developing the program an investigation of available programs was undertaken. It was found that traditional leadership training was focused on individuals without providing them with a context or creating pathways to ensure their integration into Industry. Additionally, few of the programs focused on skill development, instead providing networking opportunities and programs dominated by the provision of information with little interactive or experiential learning.

---

<sup>14</sup> Changing Industries 244 Echuca Road, Mooropna, Victoria 3629. Cheryl also facilitated the Focus Group session of Aquaculture Industry participants as part of the current project.

The program was therefore developed from the ground up based on the following principles:

1. Create a safe environment in which to learn before supporting participants to further develop their skills, knowledge, networks and confidence in the context of their Industry;
2. Gain a commitment from Industry organisations and 'champions' to resource the program and expose participants to models of best practice;
3. Build understanding across all sectors so that teams can be formed and present a whole-of-industry position to progress the Industry's best interests.

This approach requires a commitment from Industry organisations to review their policies and practices to ensure they are creating an environment which both models and encourages continuous improvement, best practice and collaborative decision making.

There have been considerable learnings through the process of developing, implementing and then reviewing and modifying this program. Key elements are discussed below:

### **Training Outcomes versus Industry/Community Development Outcomes**

It is very common in the primary industries and rural communities training environment for there to be a focus on training numbers of individuals. Success is measured by the number of individuals trained and the level of knowledge or expertise they gained. This culture was present in all sectors encountered during the program.

A challenge was to develop a culture of continual learning with training simply being a tool for achieving Industry development. In most instances this was achieved through matching of the program to that particular Industry/community and to their specific needs.

It was found that the process was more likely to be adopted or to be adopted more quickly when an Industry champion (or champions) was identified. In one instance a particular training program was offered to producers in the Industry with little success beyond the initial program and two subsequent programs being cancelled due to lack of participants. The team subsequently communicated directly with the processing sector of the Industry and immediately obtained both verbal and financial support for future programs.

### **Mentoring**

Mentoring was considered to involve learning: through discussion, observation and reflection, being supported to practice new skills and through the sharing of contacts. Mentoring is a relationship between two people with the express purpose of learning. Traditionally, an older or more experienced person has offered to share their wisdom with a younger or less experienced person. However, in more recent times there is a recognition that a balance needs to be struck between learning the corporate or traditional wisdom, with being open to new and innovative ideas that have the potential, when refined, to make a difference in the future. Hence, mentoring has the potential to be a two way learning process. This exchange of ideas was very much supported by the focus-group participants as a way of enhancing Industry involvement in development of human capital.

While initially there was a commitment to incorporate mentoring into the various programs the methodology used has developed over time. Initially industry leaders or elders were recruited as a potential mentors, a mentoring session was provided for them and then participants were invited to choose a mentor from the group. This method resulted in little uptake of mentoring and little ownership of the relationship between mentor and participant. At first there was a tendency to confuse mentoring with technical assistance on issues related to the participant's project.

Secondary issues arose in subsequent programs where participants were invited to select a mentor. Many chose an employer or family member. It was found that in most instances mentoring works most effectively when other relationships do not impinge, therefore some relational distance at the commencement of the mentoring agreement is useful. For example, father - son, employer - employee relationships appear to have pre-determined expectations which detract from the creativity and potential learning of a mentoring experience.

A separate program has now been developed to provide training and development opportunities for Industry and community personnel who have an interest in becoming a mentor within their sphere. In this way the program aims to develop a culture of passing on and expanding learning.

### **Personal Investment**

The philosophy behind the leadership program is predicated on a belief in the potential of all participants. The program content enables all participants to push themselves, it creates a learning environment within which they can feel safe to grow and develop. A critical success factor is for the facilitators and all elements of the course itself to model this belief and to genuinely invest in each individual.

Personal contact is provided to all participants in all programs both during the contact sessions and between sessions while they are undertaking their project. This is expanded to include personal contact with mentors to investigate how the mentoring process is developing from both perspectives and to offer support to deal with any issues which may arise.

In many instances the facilitators have developed a relationship with the participants, becoming a mentor and support resource far beyond the program. This has raised issues relating to funding for the program, with facilitators participating in project outcomes or events well after completion of a course in support of participants.

## **Industry Nomination and Support**

A critical component of the leadership development model is to ensure that all outcomes relate to, and are incorporated into, the Industry or community. In some instances support funding has been sourced for individuals outside the formal industry structures. In such cases the participant has less ownership and commitment to both the course and the Industry/community itself. There is a tendency for such individuals to become “loose cannons”, believing they have a charter to act on behalf of the industry / community without consulting.

A key aim has been to balance sponsorship funding with “real” linkages to industry. In the seafood industry this has been achieved through partial industry support and part individual support. All participants are required to be nominated by Industry and for their sponsor to commit to providing support funding for their particular project if required.

Work with Industry organisations has led in some cases to individuals being supported to take on formal roles on completion of a course. The organisation is supporting the development of that individual and the role that they are to play in the future. This is the outcome that the project strives for.

## **STRATEGIES TO ENSURE THAT THE AQUACULTURE INDUSTRY IN 2010 AND BEYOND CONTINUES TO BE SUPPORTED BY COMPREHENSIVE, ROBUST AND RESPONSIVE EDUCATIONAL AND TRAINING SYSTEMS.**

The focus group participants provided the following perspectives on future needs in relation to proposed growth in the Industry. Information is also included from the results of Industry surveys and consultation. These perspectives were used to identify future training needs and assess current training and education capacity.

### **POTENTIAL GROWTH AREAS/ FUTURE R & D NEEDS**

The focus group discussed potential growth areas in aquaculture linked to present research and development directions and innovations in the Industry. The following growth areas were identified:

- Mechanisation / innovative technology to reduce workload;
- New/emerging species eg yellow fin tuna, NSW pacific oysters, ornamentals, sponges, rock lobster;
- Marketing;
- Aquaculture tourism;
- Inland saline aquaculture;
- Targeting quality niche markets;
- Sea-cage and offshore (ocean) farming;
- Value adding;
- Partnerships with other industries;
- Large-scale recirculation aquaculture;
- Export of technology, training and species;
- Live fish transport;
- On-vessel farming;
- Floating raceway;
- Disease protection;
- Fish health;
- Renewable fish-food species;
- Biotechnology;

- Waste & by-product utilisation;
- Industry mergers/ vertical integration.

The Industry surveys reinforced the need for training in technology and in human capital development (management, marketing, enterprise development).

## TRAINING NEEDS/SKILLS TO MEET GROWTH AREAS

The focus group discussed future training needs to align to the growth areas identified above. These needs include:

- Engineering/ technology development and innovations;
- Nutrition (different needs for different species);
- Recirculation technology;
- Marketing / industry promotion/ promotion of Industry products;
- Industry advocates/ Public Relations and leadership;
- Tertiary education e.g. fish health and disease prevention;
- Entrepreneurial skills;
- Biotechnology;
- Communication/ people skills;
- IT/ E-Commerce;
- Global market opportunities and threats;
- Workplace research and development;
- Change management / strategic management;
- ESD /Risk management;
- Directorship/governance.

An assessment of current training and education capacity revealed a gap in the provision of Aquaculture engineering (to support the development of skills in engineering technology, recirculation technology, biotechnology). The present research emphasises on nutrition and aquatic animal health by the Cooperative Research Centre (Aquafin) provide for advanced training capacity in these areas.<sup>15</sup> The focus group participants recommended building stronger links between Universities and Industry to fill gaps in capacity and need.

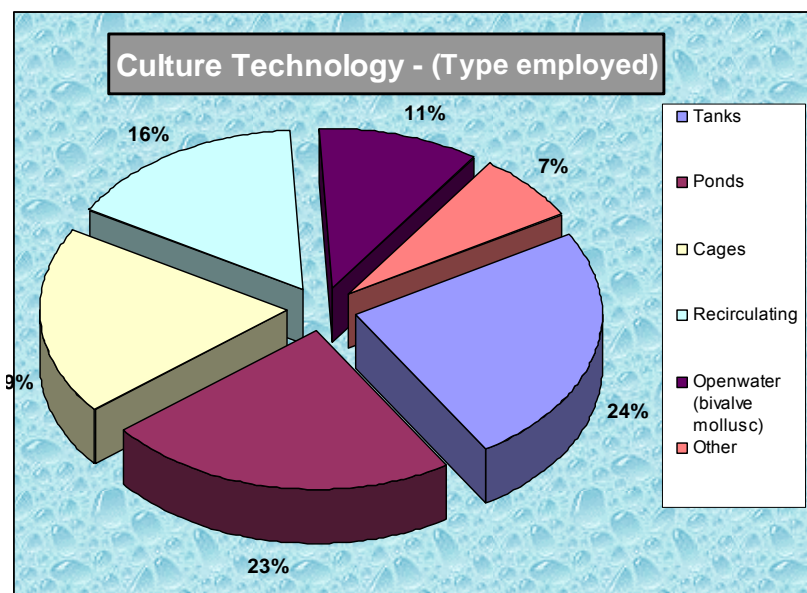
A questionnaire based on the focus group findings and outcomes was presented to Industry sectors (Appendix 5). Detailed responses to the questionnaire are presented in Appendix 6. A summary is presented below. It will be noted that the findings parallel those already presented above.

---

<sup>15</sup> Discussion with Head Aquafin CRC Dr Peter Montague revealed gaps in engineering training capacity to support technological innovation in the Australian Aquaculture Industry.

There is a general tendency towards utilisation of technology in Aquaculture enterprises which will potentially increase the demand for semi-skilled labour (farmhands) and increase demand for technologists. In addition to these changes, the seafood market is now global and Australian aquaculturalists are facing complex international trade and supply chain issues as the Australian aquaculture industry grows and competes on international markets. Technology currently used by the Aquaculture industry (as assessed through Industry surveys) is presented below.

Industry representatives surveyed revealed a projected increase in production from double to quadruple current production levels in the next six years. A summary of production forecasts arising from the Industry surveys is presented in Appendix 7. Of note is that projected labour needs do not reflect this with most industries forecasting a zero to double increase in workforce to support the projected production increase. Yet mechanisation options are still relatively scarce.



Importantly, recent changes to the Seafood Industry Training Package address current and future needs identified by the Aquaculture industry. These changes include:

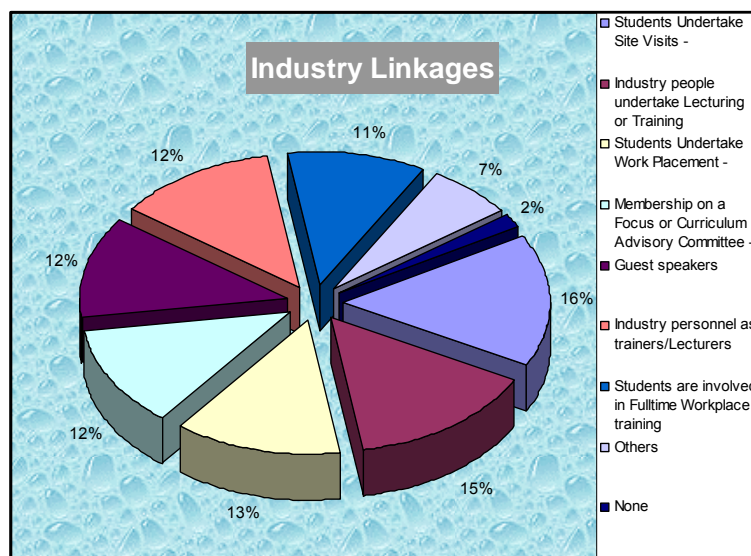
- increased coverage of environmental awareness and ESD by increasing the emphasis in core units and improving specialist units from the Business services training package;
- increase in flexibility of its qualifications framework;
- more business and financial units;
- eight new units addressing the generic skills and knowledge required by occupational divers (ADAS certification);
- a range of units targeting leadership has been added to the package to provide first level seafood industry leadership and fundamental skills and knowledge.

These changes align to identified Industry needs (identified from focus group, Industry consultation, Community of Practice, and ITAB strategic plans) including:

- development of Industry leaders or “champions” to promote Industry needs to relevant agencies including government and RTOs. The case study on Leadership Development described above reinforces this point;
- promotion and implementation of the SITP based on a responsive training culture;
- greater responsiveness of the RTOs to provide Industry focussed training in
  - Food safety;
  - Occupational health and safety;
  - HACCP;
  - Environmental management;
  - Supply chain management;
  - Risk management;
  - Husbandry, particularly breeding, health and nutrition.

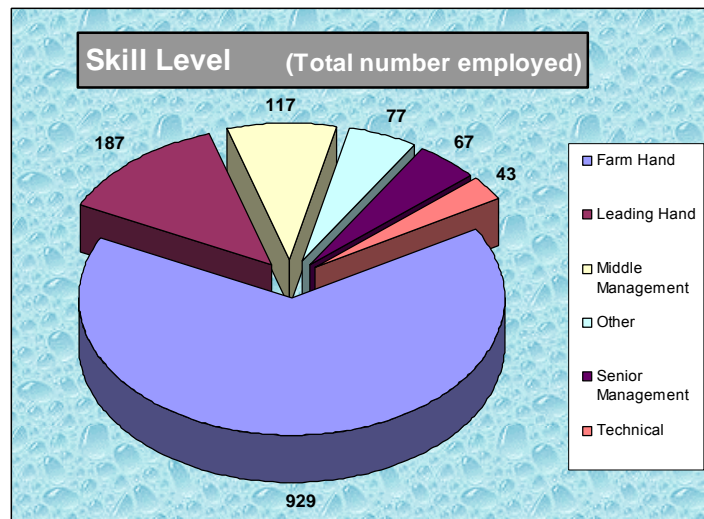
The development and maintenance of a network of responsive and aware workplace assessors is an important component to ensuring that training providers are responsive to Industry needs (see Assessors case study described above).

However, at Industry sector level, there is generally poor awareness of the SITP. This is of concern as the training flexibility offered by the package aligns to Industry needs in developing capacity in small business management, ESD, and food safety among other needs. Even so, Industry surveys revealed some participation in training via Industry linkages as illustrated below. Furthermore, the existence of “good news” stories in training (see also Indigenous case studies above) demonstrates that current training initiatives can deliver demonstrable benefits (see Appendix 8).



## CURRENT SKILL LEVELS

Surveys of the skill level currently engaged in the Australian Aquaculture Industry reveal a concentration on entry-level participation (farm hand). Of note is the relatively low participation of “Technical” personnel given the Industry’s move to adopt more technologically intensive rearing methods. However, most aquaculture enterprises have a relatively flat structure: farm hand, leading hand, manager.



Important skill area needs were identified to be:

### Senior Management

- Quality Assurance;
- Human Resource Management;
- Nutrition;
- Risk management;
- Marketing;
- Business Management;
- Environmental Management Systems (EMS);
- Occupational Health and Safety.

Of note, given the higher order skill needs, is that current degree level courses in Aquaculture underrepresent most of the skill area needs identified above.

### Leading Hand

- Occupational Health and Safety;
- Feed management.

Considered to be of lower importance to Leading Hands (but still important) were:

- Food safety;
- EMS;
- Disease Management.

### **Farm Hand**

- Disease management;
- Occupational Health and Safety;
- Engineering.

### **FUTURE TRAINING/EDUCATION NEEDS**

Of the anticipated future training and education needs identified from Industry surveys, Marketing/Industry promotion/promotion of Industry products was considered to be most important.

All other categories were considered to be of lower importance (but still important components of future needs) including:

- Engineering/technology development and innovation;
- Nutrition (different needs for different species);
- Recirculation aquaculture technology;
- Industry advocates, public relations, leadership;
- Fish health and disease prevention;
- Entrepreneurial skills;
- Biotechnology;
- Communication/people skills;
- Global market opportunities and threats;
- Workplace research and development;
- Change management/strategic management;
- ESD/risk management;
- Directorship/corporate governance.

Note that these categories align closely with those identified by Industry participants in the focus groups (as described above).

Considered least important (of the training needs identified from the focus group) was:

- IT/E commerce.

## **OBSTACLES TO SERVICING PROJECTED INDUSTRY NEEDS**

Industry surveys revealed the following potential obstacles to meeting Industry needs:

- Lack of quality skilled personnel particularly in remote regions (including workplace assessors);
- Lack of government support (complex and confusing legislative and policy requirements);
- Lack of flexibility in training delivery (Industry supported more workplace training in recognition of the difficulty of supporting employee time away from the workplace);
- Poor linkages between Industry and RTOs;
- Lack of confidence in RTOs;
- Lack of awareness of training pathways and flexible structuring of training under the SITP.

## **OPPORTUNITIES TO SERVICE PROJECTED INDUSTRY NEEDS**

Responses to industry surveys revealed the following suggested changes to current training practices:

- On-site delivery by qualified and experienced trainers (supported by a responsive network of workplace assessors);
- Training tailored to sector needs (changes to the SITP provide for such);
- Real world practical background in aquaculture for trainers/educators;
- Use real farms as models and work placements to develop skills and practical experience (particularly for Indigenous trainees);
- promote more realistic expectations to University graduates;
- Use Industry “champions” to promote training opportunities and increase awareness among stakeholders of Industry needs (see case study Leadership Development).

## **DEVELOP AND DRAW UPON SOCIAL CAPITAL TO MAKE THE MOST OF KNOWLEDGE AND SKILLS**

The Industry surveys, focus group outcomes, and consultation with key stakeholders reveal a willingness to draw upon existing social capital (i.e. Industry knowledge) in the Australian Aquaculture Industry. Successful case studies (the National Seafood Industry Advanced Leadership Program, the Community of Practice model) already presented offer templates against which such social capital can be harnessed to encourage productive participation in training for human capital development of the Australian Aquaculture Industry. Indeed, the focus group meeting proved to be a very successful means of engaging and empowering Industry in training and education initiatives. Ways forward are presented below in the context of identified current and future needs.

### **Middle Management**

There is a need to develop effective middle management in the Aquaculture industry supported by focused training in;

- Human Resource Management;
- Conflict resolution;
- Marketing;
- Business Management;
- Environmental Management Systems;
- Team building.

All these elements are supported by the SITP and potential participants in the Industry need encouragement to be involved in training programs. The prospect of using Industry champions to encourage participation in training was a consistent theme identified through Industry surveys, focus group outcomes, and other consultation conducted during this study. The Leadership Development model (the National Seafood Industry Advanced Leadership program) trailed in the Seafood Industry offers a successful example of Industry engagement. Typically, the Industry champions would be at middle management level in Industry and would bring considerable Industry experience. Ideally, training (and mentoring) would be done at the work place recognising that middle managers are busy people. The focus group concept, in which participants from diverse Industry sectors and relevant government representatives come together for a two-day facilitated workshop, is a case study in building dynamic partnerships. This partnership approach to stimulating engagement of Industry in effective training outcomes is expanded below.

### **Partnerships**

Enhanced partnerships between Industry, government extension, community and providers (also provider to provider) to provide the best services through:

- Sharing of resources/ personal trainers;
- Flexibility of delivery;

- Targeted to specific needs;
- Industry advice and involvement eg work experience, course advice, and assessment.

There needs to be a process including Australian Quality Training Program (AQTF) and Codes of Practice (COP) in place for involvement of Industry with trainers and vice-versa with trainers and Industry involved in meetings and activities. The focus group participants extended this concept to include:

- Extension of COP to be inclusive of Industry;
- Case studies of effective partnerships;
- Surveys of Industry needs (as undertaken by the focus group in this project);
- More work place training and assessment within Industry in partnership with registered training organisations;
- Promotion of the training session at the forthcoming Australian Aquaculture conference in September to ensure good Industry participation (results of the present project could be presented at this meeting);
- Commitment to workplace training.

### More Responsive RTO's

Focus group participants recommended a greater component of work-experience for trainers involved in the Aquaculture Industry. Linkage to the Community of Practice model could be fruitful in identifying practical means of achieving this outcome (see above).

Trainees should be given the opportunity to do single or clusters of units of competency i.e.

- Set some smaller milestones rather than embark on a large commitment (e.g. 23 units for a Diploma). The SITP provides for this but few in the Industry are aware of the current flexibility offered by the package. This exemplifies the disconnect between training initiatives promoted by the SITP and reception of these initiatives by Industry;
- As a way of aligning training with Industry needs it was suggested by focus group participants that the Community of Practice (see above) be harnessed to ensure packages of competencies can be provided to suit Industry needs.

*“I certainly recommend the focus group approach to improving communication between Industry, training providers and government agencies.”*

Colin Eagle, Australian Fishing Enterprises, Port Lincoln.

## **Industry Meetings Focusing on Training**

All participants agreed that the focus group concept (a two-day facilitated workshop on training and training related issues) was a very effective means of developing understanding by Industry of the benefits of training (including government incentives, flexibility offered by the SITP, specific offerings by specialist trainers, and so on). There are already a considerable number of government incentives for training (see Appendix 10). Yet current Industry awareness of these incentives is evidently poor.

On the basis of this yearly or half yearly forums (attended by senior Industry personnel) were suggested for dissemination of information, not just for training but for consideration of Industry opportunities and issues including:

- Feedback on training initiatives (Industry/trainers);
- Funding issues;
- Communication systems;
- Resourcing (of training);
- Lobbying (by the Aquaculture sector to government);
- Showcasing of the Aquaculture industry.

## **IDENTIFIED BENEFITS OF A FOCUS GROUP APPROACH TO DEVELOPING INDUSTRY AWARENESS OF TRAINING PROGRAMS**

The benefits of a focus group approach to linking Industry, Government and Training providers extend to the development and maintenance of interest and motivation in training. This is in the identified context of:

- Lack of awareness of Industry of training opportunities (including the SITP);
- Identified lack of management skills due to processors/farmhands moving into management positions (this was strongly reinforced with the results of the Industry surveys conducted);
- Industry missing opportunities and benefits accruing from training;
- Employment of suitably trained staff (people who are aware of what the Industry is about and what is involved in working in the Aquaculture Industry).

At first, a two-day workshop presents small attainable milestones representing less intimidating training structure for participants new to training and (as identified by focus group participants) would lead to:

- Increased productivity;
- More stable workforce;
- Industry more receptive to training;
- More receptive to new technologies;
- More receptive to new methods;
- More receptive to new species;
- People more content in their jobs with real career path opportunities;
- Making businesses more efficient;
- Better staff retention;
- Better management structure;
- More time to work on business than in it.

The engagement of Industry in the focus group could be facilitated by the National Aquaculture Council and supported by Seafood Training Australia. The proposed Industry focus groups could ensure that information is being fed through to all levels of Industry thereby ensuring that;

- Training is held accountable;
- Industry is getting value for money for training;
- Training and administration keeps up with changes in direction and development of new technologies that occur in the Industry.

The suggested target for participation in the Industry forums is middle managers in the Aquaculture Industry. This could proceed by:

- National Aquaculture Council (NAC) writing to Industry associations (see Appendix 8) to appoint two to three representatives from each Industry sector to participate and disseminate information to Industry;
- Focus groups to run for one to two days every 6 to 12 months in various locations;
- Focus groups to run along similar lines to the present focus group model i.e. facilitated meetings in convenient central location (e.g. Melbourne Airport).

Importantly, the participation of Industry in the focus groups would be facilitated by payment for lost work time. The opportunity cost of two days attendance at a focus group needs to be recognised for Industry to respond positively to the initiative (as shown by the positive response to the Melbourne focus group).

The focus group concept could then identify individuals who would undertake further training aligned to the Leadership elements of the SITP (see below) including:

- Business management skills;
- Human resource management;
- Environmental Management.

*“The focus group meeting proved to be an extremely valuable exercise, for both the industry participants and the representatives from government and training organisations. On a personal level I gained much from the very rare opportunity to discuss issues with a joint gathering of industry and other peers.”*

Dr David Mills, Paspaley Pearls

## FUNDING THE FOCUS GROUP CONCEPT OF DRAWING ON SOCIAL CAPITAL IN THE AQUACULTURE INDUSTRY

Funding for this initiative could include:

- Industry contribution via government eg Farmbi\$;
- On-going funding and extension of the National Seafood Industry Advanced Leadership program to specifically include the Aquaculture Industry;
- Provision to be resourced under the existing funding structure. Aquaculture Industry Action Agenda (AIAA), Agri-Foods Skills Council or the FRDC Human Capital Development Program.

*“The focus group provided the mechanism for the industry to provide concentrated critical input directly to the people developing future directions, and within a timeframe that was manageable for the industry participants. In return, the industry participants now have a much broader understanding of the management, regulatory and funding environment in which government and training providers operate. This dual educational pathway is generally sorely lacking in policy development.”*

Dr David Mills, Paspaley Pearls

## RECOMMENDATIONS

- Harness Intellectual and social capital of the Aquaculture Industry (to close the current gap between Industry, government and training/education providers) by identifying and supporting Industry participants to act as “champions” of training/education. The successful National Seafood Industry Advanced Leadership Program provides a working example of Industry engagement where experienced Industry representatives are used as mentors to develop emerging or future leaders. Provide funding (via Rural Industry Development Fund, FRDC, or DAFF) to recognise the opportunity cost of participation by Industry representatives in focus groups and Leadership Development Programs;
- The focus group model successfully applied in this project provides a working example of stakeholder engagement in the Aquaculture Industry. Participants should be Industry Leaders (identified from above), government representatives (e.g. Seafood Training Australia), and Aquaculture workplace assessors (see below). Federal support will assist in developing a uniform approach to training, education, and Industry participation across the Australian Aquaculture Industry;
- Fill gaps in current capacity by developing Centres of Excellence within the existing institutional structure (e.g. Aquaculture Engineering, Biotechnology, Aquatic Animal Health Management, Policy/Management). Demand for specialised training in such disciplines does not warrant replication across several institutions. Instead, encourage greater collaboration among training providers using the successful Community of Practice model. Intensive short course provision (one or two week duration) as currently offered in Aquatic Animal Health is attractive to Industry participants who cannot afford full time study;
- Link the emphasis on business and administration of Aquaculture above to the Leadership component of the SITP in a way that provides a seamless pathway from VET to Higher Education in line with career path opportunities in the Aquaculture Industry. A bridging course to allow for prerequisites in Higher Education program is an effective link between VET and Higher Education;
- Promote more realistic expectations among Aquaculture graduates for careers in Aquaculture by engaging Industry participation and providing practical components such as Coxswain, Commercial Diver, and other relevant certification in Aquaculture degree programs;
- Develop a network of Workplace Assessors with centralised responsibility delegated to one individual in each state who has responsibility for developing and maintaining currency in workplace assessment targeted to the needs of the Aquaculture Industry. Each state Assessor will be responsible for coordinating a network of workplace assessors in each state to ensure that training providers are responsive to Industry needs. Successful models present with the Community of Practice and similar programs in the New Zealand seafood industry.

## PROJECT TEAM

The AMC Search team contributing to this project included:

### **Dr Paul McShane**

- Project leadership;
- Report writing;
- Focus group implementation;
- Industry liaison and consultation.

### **David “Dos” O’Sullivan**

- Focus group implementation;
- Industry liaison and consultation;
- Sector research.

### **Selina Henderson**

- Sector research;
- Data compilation and analysis;
- Industry and training provider surveys.

### **Marina Samoilov**

- General Administration / Project Co-ordinator;
- Graphic Design;
- Report Production.

### **Dean Cook**

- CD Design & Production.

# APPENDIX I

## Phase 1 Questionnaire

## WHAT AQUACULTURE TRAINING AND EDUCATION IS CURRENTLY BEING UNDERTAKEN?

1. *Surveyor:* .....
2. *Date:* .....
3. *Institution:* .....
4. *Person interviewed:* .....
5. *Address:* .....  
.....
6. *Tel:* .....
7. *Mob:* .....
8. *Fax:* .....
9. *Email:* .....
10. *Web:* .....
11. **Type of organisation:** (please circle)
  - a. TAFE
  - b. University
  - c. College
  - d. Private Provider
  - e. High School
  - f. State/Territory DPIs (for short courses)
  - g. Other (eg. consultancy/service company) (describe)
12. **Registered Training Provider.** Yes    No
13. **Checklist of the course/qualifications provided: (including short / specialised courses)** (Please Circle)
  - a. *Certificate I in the seafood Industry (Aquaculture) (SFI10100)*
  - b. *Certificate II in the seafood Industry (Aquaculture) (SFI20100)*
  - c. *Certificate III in the seafood Industry (Aquaculture) (SFI30100)*
  - d. *Certificate IV in the seafood Industry (Aquaculture) (SFI40100)*

- e. *Diploma in the Seafood Industry (Aquaculture) (SFI50100)*
- f. *Aquaculture Major*
- g. *Bachelor of Agribusiness (Aquaculture) (Honours)*
- h. *Bachelor of Applied Science (Aquaculture)*
- i. *Bachelor of Applied Science (Fisheries & Aquaculture Management)*
- j. *Bachelor of Aquaculture*
- k. *Bachelor of Aquaculture (Honours)*
- l. *Bachelor of Environmental Science (Fisheries Management & Aquaculture)*
- m. *Bachelor of Environmental Science (Fisheries Management & Aquaculture) (Honours)*
- n. *Bachelor of Marine Studies-Field of Aquaculture*
- o. *Bachelor of Science (Aquaculture & Seafood Science)*
- p. *Bachelor of Science (Aquaculture & Seafood Science) (Honours)*
- q. *Bachelor of Science (Aquaculture)*
- r. *Bachelor of Technology (Aquaculture)*
- s. *Graduate Certificate of Aquaculture*
- t. *Graduate Certificate of Science (Aquaculture)*
- u. *Graduate Diploma in Aquaculture*
- v. *Graduate Diploma of Science (Aquaculture)*
- w. *Introduction to Warmwater Aquaculture*
- x. *Master of Applied Science (Aquaculture)*
- y. *Master of Aquaculture*
- z. *Master of Science (Aquaculture)*
- aa. *Other*

.....  
.....  
.....

**14. Course/qualification:**

- a. When first started : .....
- b. Students/Participants over past 5 years: .....
- c. Average duration: .....
- d. Other comments: .....

15. **Who are these courses aimed at?** (Please Circle)

- a. New entrants to industry
- b. School leavers
- c. Farmhands
- d. Leading hands
- e. Existing experienced workers (wanting a qualification)
- f. Managers
- g. Farmers wishing to diversify
- h. Specialists/Technicians
- i. Others (describe)

16. **What flexibility is there for students?** (Please Circle)

Time-

- A. DURING HOURS,
- B. AFTER HOUR
- C. WEEKENDS
- D. SEASONAL (OFF-SEASON)

17. **Duration** –

18. **Mode of delivery** – (Please Circle)

- a. Face-to-face
- b. Group discussion
- c. Remote/internet
- d. Other

19. **Locations** – (Please Circle)

- a. Workplace
- b. Institutional based
- c. Mixture

20. **Other information** .....

.....  
.....  
.....  
.....

21. **What training and education do these courses provide** (use the checklist)

Topic	We Provide it Yes / No	Theoretical/ Hands on or Both	SITP Competency
a. Food Safety			
b. Environmental Management			
c. Business Management			
d. Marketing			
e. Disease Management			
f. Risk Management			
g. Supply Chain Management			
h. Quality Assurance			
i. Leadership			
j. Succession Planning			
k. Other (describe)			
l. Comments			

22. **How do you ensure that best industry practice is utilised in your training / education?**

.....

.....

.....

.....

.....

.....

23. **Do you provide species-specific training?**

a. If yes, which species? .....

b. Can you provide more details? .....

.....

.....  
.....

**24. Do you provide culture technology specific training?**

a. If yes, please describe? .....

b. Can you provide more details? .....

.....  
.....  
.....

**25. What industry linkages do you have? (Please Circle)**

- a. Focus or Curriculum Advisory Committee
- b. Work Placement
- c. Workplace training,
- d. Lecturing or Training
- e. Site Visits
- f. Guest speakers
- g. Industry personnel as trainers
- h. Other (describe)

**26. There is much talk of finding out about the client (industry) needs.**

a. What methods do you use? .....

.....  
.....  
.....  
.....

b. What works? .....

.....  
.....  
.....  
.....

c. What are your problems/constraints? .....

.....  
.....  
.....  
.....

**27. What are the training pathways for your students? (Please Circle)**

E.g. Farmhand job –

- a. Certificate II – Certificate IV / Diploma
- b. 1<sup>st</sup> year degree
- c. Full degree
- d. Specialist job

Any Case Studies?

**28. Are there policy and guidelines in place for linkages between the competency-based training of the SITP into university-based education? .....**

a. If yes, how does this work? .....

.....  
.....

**29. The SITP is ungraded; they are either not yet competent or competent. How do you take this into account when enrolling students?.....**

.....  
.....  
.....  
.....

**30. Can you have recognition of prior learning or credits for certain subjects, including work-practice? .....**

**31. What numbers of students have successfully moved along this pathway?**

.....

Any case studies? .....

.....  
.....  
.....  
.....  
.....  
.....

**32. What government support for training and education are clients able to access? (Please Circle)**

- a. Traineeships/Apprenticeships
- b. CDEP/Ab Study (Indigenous)
- c. Farmbi\$
- d. Other state/territory funding
- e. Fee-for-service
- f. Industry organisation workshops

g. Other (describe)

**33. What, if any, major impediments do your organisation face in delivering training/education to, and for, the aquaculture industry?**

.....  
.....  
.....  
.....  
.....  
.....

**34. What changes do you anticipate in the delivery of aquaculture training / education from your organisation during the next 10 years.**

- a. Mode of delivery – .....
- b. More or less workplace training –.....
- c. Fewer or more locations – .....
- d. Fewer or more courses – .....
- e. Focus on lower or higher level training/education –.....
- f. Other -.....

**35. Please provide an example of a good news stories or case studies of training that has been successful for students and industry?**

# APPENDIX II

## Phase 2 Questionnaire

**WHAT AQUACULTURE TRAINING AND EDUCATION DO WE NEED TO SUPPORT RESPONSIBLE INDUSTRY GROWTH**

- 1. Surveyor: .....
- 2. Date:.....
- 3. Company.....
- 4. Person interviewed:.....
- 5. Address:.....
- 6. Tel:.....
- 7. Mob:.....
- 8. Fax:.....
- 9. Email:.....
- 10. Web:.....

**11. Type of facility: (circle more than one if required)**

- a. Hatchery
- b. Nursery
- c. Ongrowing
- d. Growout
- e. Processing
- f. Marketing
- g. Tourism
- h. Mixture
- i. Other .....

**12. Species (main ones):**.....

.....

.....

.....

**13. Culture technology: (circle more than one if required)**

- a. Cages

- b. Tanks
- c. Recirculating
- d. Ponds
- e. Openwater (bivalve mollusc)
- f. Other.....
- .....

**14. Current annual production level: (if this is not confidential)**

- a. Tonnes:.....
- b. Individuals:.....
- c. Others:.....

**15. Current staff complement:**

Type –

- a. Full time.....
- b. Part-time.....
- c. Casual.....
- d. Unpaid (eg family) .....
- e. Other .....

**16. What number of staff do you have at present in the following levels?**

Skill Area	Numbers
Senior Management	
Middle Management	
Leading Hand	
Technical	
Farm Hand	
Other	

**17. For each of these levels please tick which skills you consider as important**

- = Really Important
- = Quite Important

√ = Some Importance

0 = Not important

Skill Area →	Food Safety	EMS	Business Mng't	Marketing	Disease Mng't	Risk Mng't	Supply Chain Mng't	QA	OH & S	Other
Staff Level ↓										
Senior Management										
Middle Management										
Leading Hand										
Technical										
Farm Hand										
Other										

**18. What exposure or linkages do you have with training and education institutions?  
(Please circle)**

- a. Membership on a Focus or Curriculum Advisory Committee
  - b. Work placement of students
  - c. Lecturing or training at the institution
  - d. Site visits by students
  - e. Advice sought from trainers re course content
  - f. No training
  - g. Other.....
- .....

**19. How are your staff currently trained? (Please Circle)**

- a. On-The-Job
- b. Classroom Based
- c. Off-The-Job
- d. Short Course
- e. Combination of the above
- f. Other .....
- .....

**20. In your opinion what is the most appropriate way for learning to occur? (Please tick relevant boxes).**

Response →	Fully Agree	Agree	Neither agree nor disagree	Disagree	Fully Disagree
Question ↓					
Training is best conducted at the workplace					
Training is best conducted in the classroom					
Training is best conducted as a mixture of workplace and classroom learning					
Training is best conducted by people within your organisation					
Training is best conducted by specialist trainers					
Formal training is not required					
Regular up-skilling is important					

**21. How do you find out about current education and training opportunities for the aquaculture industry?**

.....  
 .....

**Now, let us look to the future**

**22. What do you project/estimate your annual production level to be in 6 years time?**

- a. Tonnes .....
- b. Individuals .....
- c. Others.....

**23. A recent industry focus group listed likely growth and emerging areas in aquaculture from now until 2010. The training and education implications for these emerging areas were identified: Please rate these implications by placing ticks in the boxes.**

- = Really Important
- = Quite Important
- √ = Some Importance
- 0 = Not important

Implication- need for training & education in:	Importance Rating (Ticks)
Engineering/ technology development and innovations	
Nutrition (different <b>needs</b> for different species)	
Recirculation aquaculture	
Marketing / industry promotion/ promotion of industry products	
Industry advocates, PR and leadership	
Tertiary education eg fish health and disease prevention	
Entrepreneurial skills	
Biotechnology	
Communication/ people skills	
IT/ E-Commerce	
Global market opportunities and threats	
Workplace R & D	
Change management / strategic management	
ESD /Risk management	
Directorship/governance of companies, industry bodies etc	

**24. What percentage increase in your workforce do you envisage will be required to expand the business?**

.....

.....

**25. What obstacles do you see in reaching your goals?**

.....

.....

**26. What new training arrangements will be required?**

.....

.....

**27. What new or different training resources will be required to expand the business (eg funding initiatives, electronic delivery)?**

.....

.....

**28. What else will be needed for aquaculture training and education to meet the changing demands of the industry?**

.....

.....

**29. What would you like to see happen in the future for the aquaculture industry by way of education and training?**

.....

.....

**30. Any other comments in regard to training and education to support responsible growth of the aquaculture industry between now and 2010?**

.....

.....

# APPENDIX III

## Focus Group Participants

**FOCUS GROUP PARTICIPANTS**

Industry sector	Company	Representative	Phone / Fax Mobile	Email
Pearls	Paspaley Pearls Darwin	David Mills	08 8982-5555 08 8982-5502 (Fax)	<a href="mailto:dmills@paspaley.com.au">dmills@paspaley.com.au</a>
Oysters	Barilla Bay Oysters, Hobart	David Forest	03 6248-5458 03 6248 5559 (Fax)	<a href="mailto:barilla@tassie.net.au">barilla@tassie.net.au</a> (prefers Fax)
Tuna	Australian Fishing Enterprises, Pt Lincoln	Colin Eagle	08 8682-5711 08 8682-6987 (Fax) 0408 604-185	<a href="mailto:colin@plms.com.au">colin@plms.com.au</a>
Prawns	Seafarm, Cardwell (Innisfail / Cairns)	Andrew Crole	07 4066 8084 074066 8990 (Fax)	<a href="mailto:seafarm@bigpond.com">seafarm@bigpond.com</a>
Barramundi	Marine Harvest Darwin	Paul Basher	08 8978 3987 08 8978 3793 (Fax) 0407 321 658	
Salmon	Tassal Hobart	Shirley Gibson	03 6211-9605 03 6224 2222 (Fax)	<a href="mailto:sgibson@tassal.com.au">sgibson@tassal.com.au</a>
Indigenous	Snowy River Native Fish Hatchery, Orbost	David "Buzz" Hewat	03 5154 2606 03 5154 2608 (Fax) 0427 542 606	<a href="mailto:hew01@pacific.com.au">hew01@pacific.com.au</a>
	Seafood Training Tas	Paul Viney		<a href="mailto:shell@tassie.net.au">shell@tassie.net.au</a>
	AMC	Paul McShane	03 6335 4400 0418 132 885	<a href="mailto:p.mcshane@fme.amc.edu.au">p.mcshane@fme.amc.edu.au</a>
	AMC	Selina Henderson	03 6335 4486	<a href="mailto:s.Henderson@fme.amc.edu.au">s.Henderson@fme.amc.edu.au</a>
	DOS Aqua	David O'Sullivan	0418 130-595	<a href="mailto:dosaqua@bigpond.com">dosaqua@bigpond.com</a>
		Alicia Hettner		
		Brett Stevens		<a href="mailto:brett@waterfront.net.au">brett@waterfront.net.au</a>
	Facilitator	Cheryl Phillips		<a href="mailto:cheryl.phillips@inet.net.au">cheryl.phillips@inet.net.au</a>
	Seafood Training Aust	Ross Ord		<a href="mailto:rord@asic.org.au">rord@asic.org.au</a>
	Seafood Training Aust	Jo-anne Ruscoe		<a href="mailto:jo-anne.ruscoe@cdu.edu.au">jo-anne.ruscoe@cdu.edu.au</a>
	DAFF	Inga Davis		<a href="mailto:inga.davis@affa.gov.au">inga.davis@affa.gov.au</a>

# **APPENDIX IV**

## **Notes from North Queensland Indigenous Aquaculture Forum**

## **NOTES FROM NORTH QUEENSLAND INDIGENOUS AQUACULTURE FORUM**

On 4<sup>th</sup> May 2004 Jo-anne Ruscoe attended the North Queensland Indigenous Aquaculture Forum and Meeting of indigenous representatives with North QLD Indigenous Aquaculture Working Group on behalf of the Australian Maritime College.

### **Associated papers:**

Executive Summary of The Scoping Study Report into Opportunities for Indigenous Aquaculture in North Queensland.

Full scoping study has been requested from Minniecon and Burke Pty Ltd (consultants)

## **North Queensland Indigenous Aquaculture Forum**

4<sup>th</sup> May 2004

**Conference Rooms Cairns Colonial Club  
Behan Street, Manunda (at rear of the main resort)**

### **AGENDA**

Registration, coffee and tea on arrival at 8.30am

***Commences at 9.00am***

#### **Traditional Owner Welcome to Country**

Chair of Session : Manuel Nomoa, Badu Island Council

“Status of Aquaculture in Queensland” Ian Yarroll, Fisheries & Aquaculture Development, QLD Fisheries Service

“Progress so far by the North Queensland Indigenous Aquaculture Working Group” Bruce Gibson, Chair, North QLD Indigenous Aquaculture Working Group

#### ***Morning Tea***

“Scoping Study Consultancy on the Opportunities for Indigenous People in Aquaculture in North Queensland” Minniecon & Burke Pty Ltd

“Progressing the North QLD Indigenous Aquaculture Working Group to Mura Bama Aquaculture Incorporated” Fred Pascoe, Morr Morr Pastoral Company

#### ***Lunch***

Chair of Session: Chris Robertson, Queensland Fisheries Service

“Queensland aquaculture industry response” Graham Dalton, Queensland Aquaculture Industry Federation

“R&D response” Rocky de Nys, James Cook University

“Feedback and thanks, closure of forum” Bruce Gibson, Chair, North QLD Indigenous Aquaculture Working Group

#### ***Afternoon Tea***

Meeting of indigenous representatives with North QLD Indigenous Aquaculture Working Group

***5pm Close***

## NQIAWG

North Queensland Indigenous Aquaculture Working Group (NQIAWG) provides representation for North Queensland Indigenous communities from Bowen to the Torres Straits and the Gulf Region.

NQIAWA was established by four indigenous people following an initial workshop in 2002. This group has driven the actions to date.

The objectives of NQIAWA are guided by the *National Development Strategy for Indigenous Communities in Australia* and are:

1. Facilitate indigenous ownership of sustainable aquaculture enterprise.
2. Employment, economic development and training opportunities for indigenous people (jobs, jobs, jobs recommended from Fitzgerald Report).
3. Improving economic development opportunities for indigenous people through entry and diversification into the aquaculture industry.
4. Through aquaculture, supplement and diversify food production in communities for local use, sale and restocking of local fisheries.

The most significant outcome to date from the Working Group process has been the instigation of the Scoping Study for Indigenous Aquaculture in North Queensland. Funding from the Queensland Department of Primary Industries & Fisheries, Queensland Department of Employment and Training, and the Commonwealth Department of Agriculture Fisheries and Forestry was provided to identify realistic forms of aquaculture for indigenous communities.

**The aims of the forum were stated** *“Together we can then begin to plan future projects, funding strategies and a foundation for implementation to meet the aspirations of our communities.”*

## SCOPING STUDY

Consultants Minniecon & Burke Pty Ltd undertook the Scoping Study and presented the executive study at the Cairns forum.

## VIEWS RECEIVED

The views of the following individuals were documented in regard to the education and training needs specific to Indigenous learners engaged in aquaculture activities:

## INDIGENOUS PARTICIPANTS:

### **Bruce Gibson, NQIAWG**

This group has been indigenous driven. Participants paid their own way to Cairns, which indicates commitment to govt. and industry. Previous projects have not gone forward e.g. Kowanyama (West side of Cape) self-funded a feasibility study into redclaw but did not progress due to lack of Community support. It is very important that support from the appropriate people is gained. There is a strong emphasis on indigenous people not speaking for the land of others. This is important for any training programs in communities.

This group has proven its commitment.

As a result of dislocation and removal of personal choice most communities lack capacity and this is why we have no jobs or expectations. Aquaculture is a vehicle for strengthening people.

### **Terry Laifoo, crocodile farm.**

Has 2 trainees currently trained by Tropical North Queensland Institute of TAFE from the Innisfail Campus – Contact here is Joe Coco.

### **Brian Singleton – Marugu Aboriginal Association.**

Have Pearl Farm at Cooktown. Have had previous training delivered for diving, emergency at sea, coxswains. Farm has lapsed due to lack of money, although the members and association kept it operational for a period. The Association is anticipating new start up as a result of the new enthusiasm. Several previous employees are still in the area and available for restart.

Brian asked about training available at Innisfail TAFE. He wasn't aware of the possibility of workplace training. He would prefer this option as more relevant and appropriate for people.

### **Charles Missi – Torres Strait**

There is confusion regarding jurisdiction over development i.e. role of govt, GRMPA, legislation etc.

Wants grass roots involvement and up front "what is in it for the people."

Concerned over mainstream industry reaction/support for indigenous development.

Development requires coordination, but every community is a law unto itself. There is no track record of good coordination in QLD.

The technology is there and the techniques are known – why can't we do this? We should be able to do this just as well as the white fellas.

We need a level playing field – why can't we do it?

Need a long-term strategy for sustainable growth.

Very concerned about environmental damage – our land and water is what sustains us.

Need action not more talk.

### **Dennis Ah-Kee, Indigenous aquaculture development unit, DAFF**

DAFF is not a bottomless bucket of money

Supports collaborative projects with potential to lead toward self-sustainability e.g., NT sponge project (ILC, DET, AIMS, DAFF, Lo-tech Aquaculture Pty Ltd, and Communities), the Kimberley 'Aquapack' project, and the Scoping study for Nth Qld.

If projects aren't voiced by indigenous people, indicates either a lack of community understanding or a lack of community support.

Triple bottom line assessment of projects is very important for indigenous communities to assess projects and also for funding decisions.

### **OTHER PARTICIPANTS:**

#### **Ian Yarroll, QDPI**

Initial projects to develop indigenous aquaculture need to be successful. Success breeds success.

QDPI has sought funding for an indigenous aquaculture extension officer.

#### **Graham Dalton, Queensland Aquaculture Industry Federation**

Aquaculture is science-based. In addition managers, community drivers require management and business skills. Joint ventures are more likely to succeed if the community can present partners with evidence of Community support, details of appropriate sites, and the relevant approvals where possible. Then, a joint venture becomes attractive to partner investors. The ability to have an understanding of these requirements could be provided through targeted training – perhaps through Farm biz or similar. In QLD and NT Farmbi\$ funds programs for indigenous landowners regardless of primary producer status, not sure about other states.

Graham stated that mainstream industry can and is willing to provide training and is generally happy to contribute where possible. Industry can also provide models/advice on environmental management.

Industry is supportive of hosting work experience, training etc.

### **Assoc Prof Rocky de Nys, researcher from James Cook University**

Strongly recommends transfer of known technology rather than uptake of farming of new species.

Existing species (redclaw, barra, prawns, pearls, ornamentals, crocs) should be the focus, as there are existing support programs – AIMS, James Cook, TAFE, QDPI. Suggests pilot projects and partnerships to reduce risk, provide training and assess suitability to Community.

New Sp. with some knowledge include *Trochus*, mudcrab, sponges, lobster fattening, reef fish, sea cucumber. There is hatchery seed available but these are not tried commercially.

New species such as Lobster, sponges, reef fish: no hatchery supply, rely on wild harvest and impact is unknown. Research needs to be done first. Indigenous involvement through site-specific pilot trials, development of partnerships between Communities and R& D providers including TAFE, adopt a long-term framework (minimum 3-5 yrs) and ensure a commercial focus to research.

Questioned the recommendation of the scoping study for a multi species hatchery in north Qld. Preferred a model of an Aquaculture Development and training Centre, which would focus on training, hatchery, growout out etc. including pilot scale trials of new species. This would inform and assist in the development of projects and business plans.

### **Julia Curtis,**

Advised on the Council of Australian Governments (COAG) initiative whereby all governments work together to improve the social and economic well being of Indigenous people and communities [http://www.icc.gov.au/coag\\_initiative](http://www.icc.gov.au/coag_initiative). Current trials are underway in (see weblinks for more details):

- [Cape York](#) in Queensland;
- [Wadeye](#) in the Northern Territory;
- [Anangu Pitjantjatjara \(AP\) Lands](#) in South Australia;
- [Shepparton](#) in Victoria;
- [WA COAG Trial Site](#) in Western Australia;
- [Murdi Paaki](#) in New South Wales;
- [North Eastern Tasmania](#); and
- [ACT](#)

### **Key objectives for the COAG Trial in Indigenous communities are to:**

- Tailor government action to identified community needs and aspirations;
- Coordinate government programmes and services where this will improve service delivery outcomes;
- Encourage innovative approaches traversing new territory;
- Cut through blockages and red tape to resolve issues quickly;
- Work with Indigenous communities to build the capacity of people in those communities to negotiate as genuine partners with government;
- Negotiate agreed outcomes, benchmarks for measuring progress and management of responsibilities for achieving those outcomes with the relevant people in Indigenous communities; and
- Build the capacity of government employees to be able to meet the challenges of working in this new way with Indigenous communities

### **Observations relevant to AIAA strategy 9**

- The outstanding need appears to be the capacity building of leaders and communities to work within the mainstream framework and to drive projects forward.
- There is a positive attitude to training although more information is required on flexible delivery, including workplace-training programs.
- No awareness that the SITP can deliver higher-level skills in areas such as management and capacity building exists, but many are interested in this.
- There is no awareness regarding the Advance-In Leadership program, but when explained, there was much interest in this as a valuable tool for developing capacity. I identified 3 outstanding indigenous members of the NQIAWG who would really benefit from this program.
- The joint training/research centers idea put forward by Prof de Nys has merit.

### **Recommendations from attending this forum (without access to full scoping study at this point):**

Indigenous people in Nth Queensland who are interested in developing an aquaculture industry or community project require the following knowledge and skills development as priority areas:

- Developing business plans
- Leadership
- Familiarisation with regulatory framework and government
- Access to industry to 'see and do' before committing to a project

- Work experience programs
- Technical skills training on-site/or at an appropriate training center

**There also needs to be:**

- Whole of government approach to projects (see COAG)
- Cultural awareness development for trainers

The attached scoping study executive report and major report to follow provides additional and detailed recommendations regarding training and education needs of indigenous people to develop aquaculture projects and industry.

# APPENDIX V

## Results from Phase 1 Survey

# **APPENDIX VI**

## **Results from Phase 2 Survey**

# **APPENDIX VII**

## **Results from Phase 2 Survey - Responses to Production Levels**

# **APPENDIX VIII**

## **Success stories in Training and Education**

## **CASE STUDIES OBTAINED FROM PHASE 1 OF THE PROJECT**

### **Challenger TAFE/WA Maritime Training Center**

#### **Jeff Cooper**

Jeff initially undertook a certificate II in Aquaculture (prior to the introduction of the SITP) in Fremantle WA. After completing the certificate Jeff went on to the Australian Maritime College (AMC) in Tasmania where he completed a Bachelor of Applied Science Fisheries Degree. Once Jeff completed the degree he went on to work in the aquaculture industry. Jeff is now employed as an industry trainer in Broome, WA.

#### **Brendan Spillman**

Brendan undertook a certificate II in Aquaculture in Fremantle, WA. Upon completion of the certificate Brendan went on to study a Diploma in Aquaculture at the University of Tasmania. Brendan is now employed as an industry manager in South Australia.

### **Goulburn River Trout Australia**

A student who completed a certificate III in aquaculture was recognised for his efforts when he was recognised by industry and training bodies through his nomination at a gala dinner for "Trainee of the Year".

### **Queensland DPI/ Northern Fisheries Centre**

Queensland DPI/ Northern Fisheries Centre ran a two-day information workshop on the Management of Live Prey Production. The participants were supplied with information compiled by Queensland Department of Primary Industries and Fisheries along with a practical exposure, thus enabling the individuals to go through their action learning cycle. Information provided was to highlight the current practices involved in culturing Micro algae, Rotifer and Artemia.

A new member to the aquaculture industry had developed a hatchery and had some limited success in culturing and survival rates. After completing the live prey workshop described above, the applicant improved in the culturing of rotifers and algae. After implementing best practice and refining his management, he has also dramatically improved on the survival rates of Barramundi.

Due to the number of enquires after the first workshop; the Queensland DPI/Northern Fisheries Centre intends to conduct another workshop in 2005.

## **Myola Training Services/Dover District High School**

Dover District High School, of which Myola Training Services is the registered training arm, has not only been a pioneer in the delivery of school-based and vocational training in aquaculture, it has also been recognized as a training provider of the highest quality. The achievements and successes of Dover District High School and Myola Training Services can be summarized as follows:

- Dover District High School was the first school in Australia to formally introduce aquaculture into the curriculum with the development of the Tasmanian Certificate of Education Year 9/10 Aquaculture syllabus in the late 1980's.
- The school was the first to establish and operate its own shellfish farm in the mid-1980's, a facility, which is still used to support its educational and training programs.
- Dover District High School (later MTS) was the first school or college in Australia to offer nationally recognised training in aquaculture when it delivered Certificate I in Aquaculture (Finfish) in 1996.
- MTS was one of the first school-based Registered Training Organisations to deliver qualifications from the national Seafood Industry Training Package in 2000. Prior to this MTS was involved in the original scoping project for the SITP and has contributed to the review of the package. MTS was a member of a consortium short-listed by Seafood Training Australia to tender for the preparation of support materials for the package.
- MTS delivers its aquaculture training through an enterprise education model. Students and trainees are given realistic and responsible management roles in the operations of the aquaculture facilities, which now include the mussel and oyster farm and a land-based Atlantic salmon hatchery and grow-out system using recirculating technology. They are also given the opportunity to establish small-business enterprises, which have included making abalone catch-bags to be marketed by the Tasmanian Abalone Council, and constructing salmon mort-bags under contract from Tassal Ltd. This model of delivery maximizes the opportunity for the development of practical skills and involves the trainees more directly in authentic assessment. The enterprise model at MTS was recognized by the Commonwealth Government in the 1997 Making It Happen project which was disseminated to 11,000 schools across Australia and in 1998 MTS was awarded a Demonstrating Best Practice Project grant by the Australian National Training Authority to prepare professional development materials for other RTO's.
- MTS was awarded the Tasmanian VET in Schools Excellence Award by the Tasmanian State Training Authority in 1999.
- MTS was the first rural school in Tasmania to be permitted to offer vocational training to Year 11/12 students, a privilege until 1995 reserved for city-based colleges. The success of the aquaculture-training program at Dover in its first year has since seen the establishment of vocational education and training in 26 other rural centres across the state, significantly increasing retention rates from Year 10 to 11, in the case of Dover from 25% to 100% of students. This fact was recognized by the Society for the

Provision of Education in Rural Australia, which awarded MTS the 2000 Australian Rural Education Award.

- MTS has developed very close partnerships and working relationships with local industry, most successfully with Tassal Ltd, the Huon Aquaculture Company, and Dover Shellfish. In recognition of the quality of training delivered by MTS and the level of competence of its trainees, the Huon Aquaculture Company annually sponsors Tasmania's most valuable aquaculture training award, the Adam Heather Memorial Award open only to trainees enrolled with MTS.
- MTS was commissioned by Queen Charlotte College in Picton, New Zealand to provide professional advice on the establishment of the QCC Aquaculture Academy, a training body supported by the Marlborough Mussel Farmers to the tune of \$35,000 pa. A representative of MTS spent a week in New Zealand in June 2002 providing such advice and a reciprocal student exchange program between QCC and MTS will begin from 2004.
- With the aquaculture industry widely dispersed across the state but with training expertise located centrally MTS recognized the need for the provision of flexible delivery. In 2000 MTS began delivering Open Learning aquaculture training to students in two locations on the west and northwest coasts. In 2001 with support from the Department of Education's e-magine Centre for Excellence in Online Learning MTS delivered online aquaculture training to ten other centres which has now more than doubled the number of Tasmanian school and colleges students undertaking Certificates I and II in the Seafood Industry (Aquaculture). To support this delivery MTS established the Aqua-Camp concept, which annually brings together every Tasmanian Aquaculture VET student together for a one-week induction to the industry. The camp provides for farm and factory visits as well as for practical skill-based sessions.
- MTS is currently working with e-magine to develop a multi-media software simulation of an aquaculture operation – The Virtual Fish Farm. International interest has already been expressed in this project and it will be promoted at the Atlantic Aquafair in New Brunswick, Canada in June this year. Steps are also being taken to provide real-time water-quality and feed information from the MTS hatchery to online students via the uploading of data and webcam images to the online aquaculture classroom.
- The personal achievements of the MTS coordinator and aquaculture trainer Steve Harrison were recognized in 2002 when he was presented with a Commonwealth Government National Excellence in Teaching Award after being nominated by industry representatives on the MTS Management Committee.
- MTS became registered for Certificate III in the Seafood Industry (Aquaculture) in 2002 and is developing an RCC service for people currently employed within the aquaculture industry. MTS is also currently in the process of gaining approval from MAST to deliver Coxswain's certificates of competence from its training centre in Dover and will be funded by ANTA under the Skills Centre project to greatly expand and update its facilities. These developments will allow MTS to become more directly involved in industry training and will benefit employers from access to a locally based facility.
- MTS was a founding member of the Seafood Training Australia Community of Practice and coordinated and hosted the inaugural national AquaEd Conference and Workshop for aquaculture trainers, educators and extension officers in Hobart last

year. The AquaEd concept followed on from the Aquatech 2000 workshop held in Fremantle, which had a much narrower focus. The success of the AquaEd conference was such that it will now become an annual event and this year is being held in Darwin in July. MTS has also had trade-show displays and presented papers at World Aquaculture 1999, and Aquafest 2000 and 2002.

- Above all the greatest success for MTS has been in the outcomes for its students and trainees. MTS has on average an 80% completion rate in terms of students receiving Certificates or Statements of Attainment and a 75% employment outcome in terms of students finding employment in the seafood industry. In 2002 100% of students gained employment. These rates are significantly higher than the Tasmanian VET in Schools averages.

### **Cowell Area School**

A year 12 Student in 2004 has been working towards certificate II and a coxswain's ticket, with the ultimate goal of a career in compliance. At year 12 the student undertook school based New Apprenticeship requirements, achieving highly in the three subjects at stage 2 (16/20, 17/20 & 16/20). The student worked two days a week and was at school for the remaining three days. The seafood Operations course was eligible to be counted for university entrance - 16/20 - the first student to undertake this course in South Australia. The student has stepped into leadership roles at work and was responsible for carrying out leadership duties at work during the summer while the owner was away on holidays.

### **Australian Barramundi Farmers Association/ Seafood Farming Services**

Currently eight Barramundi farmers are implementing EMS programs on their farms. Some will seek ISO 14001 Accreditation as a result of the training given to them.

### **Spencer TAFE (SA)**

#### **Misha Anderson – Aquaculture Production Technician**

Misha Anderson graduated in 2000 with a Diploma in Aquaculture after completing her Certificate III in Aquaculture at Spencer TAFE Kadina campus the year before. Within a few months of graduation, she found employment with Southern Australian Seafoods Ltd Pty (SAS), an abalone farm at Boston Point, about 10km north of Port Lincoln.

Misha was originally employed at SAS to look after the company's abalone growout systems, feed the animals, manage water quality and collect environmental and production data. More recently, she has become involved in analysing production data, production management, developing new methods for culturing abalone and tank maintenance, harvesting abalone and delivering them to export facilities and working in the abalone hatchery and nursery to produce the young animals for the growout system.

In 2001, Misha was the recipient of the South Australian Vocational Student of the Year Award and competed for the Australian Vocational Student of the Year Award in Canberra. In addition Misha has given talks sharing her thoughts and experiences with aquaculture students and other women working in the industry.

### **Simon King – Oyster Farm Worker**

Simon graduated in 2003 after completing the Certificate III and Diploma of Aquaculture. Simon now works for Lester Marshall Oyster Farm at Coffin Bay on maintenance and construction of oyster growing systems, deployment and recovery of oysters and grading. Coffin Bay, on the Eyre Peninsula, is fast becoming recognised as one of the premier oyster growing regions in Australia.

### **Shelley Harrison – Higher Degree by Research**

Shelley Harrison graduated from Spencer TAFE with a Diploma in Aquaculture in December 2000, winning the inaugural Tuna Processors Award for Academic Excellence after studying for 2 years in Port Lincoln. Shelley then completed a further 2 years study at Flinders University graduating with a Bachelor of Technology in Aquaculture in December 2002.

Shelley has obviously achieved well in her academic studies and has just started an Honours project through Flinders University based in Port Lincoln on a project titled “The Interactions between Seabirds and Finfish Aquaculture Operations near Port Lincoln”.

Initial studies will look at banding Silver Gulls to track their movements and to see if they have a preference for feeding sites including tuna and kingfish pens. The studies may also look at the amount of feed that is lost to the gulls and other marine birds and may lead to better methods of feeding to reduce this loss. Shelley has several supervisors for the project including Dr Ib Svane of SARDI who is based at the Marine Science Centre. Field studies will start soon and Shelley is presently busy completing the literature review. Shelley’s priority is to complete this honours study first then perhaps work in industry or look at a suitable PhD project.

Shelley’s academic background is interesting. After completing her year 12 studies at Trinity College, Gawler, Shelley entered Flinders University and finished the first year of a Bachelor of Science Degree. However, Shelley wanted a more hands on education and enrolled in the Spencer TAFE Diploma in Aquaculture in Port Lincoln. Shelley enjoyed the practical nature of the TAFE course and felt that there was a good balance between practical skills and theory. In addition Shelley felt that TAFE imparted a sound knowledge of the aquaculture industry and this provided a good focus during her degree studies.

Shelley thinks “everyone should do the TAFE diploma course before university” and she felt the diploma course was valuable in its own right as well as being tremendously helpful during university studies. Shelley specifically requested a project based in Port Lincoln and is very happy to be back again at the Marine Science Centre.

### **Aquafin CRC (SA)**

Emily Downes wrote the article given below for the Aquafin CRC magazine for a course they supported industry to attend: -

“Thanks to an intensive course on toxic micro-algal identification, South Australia’s finfish aquaculture industry can be confident, assured they have the necessary skills to prevent the potential impacts of an algal bloom on their productivity. Emily Downes attended the workshop conducted on the 2nd –3rd October and gives readers a report”.

“The Southern Bluefin Tuna Subprogram Steering Committee who originally identified the need for this course, successfully applied for, and received a full grant from Aquafin CRC and the FRDC to bring this initiative to South Australia, after the emergency response course was run successfully with Atlantic salmon farmers in Tasmania. The Department of Primary Industries and Resources of South Australia (Aquaculture) also provided support and assistance to bring this course to fruition.

This two-day intensive course held at the Lincoln Marine Sciences Centre in Port Lincoln, saw eleven industry representatives from the southern Bluefin tuna and yellowtail kingfish sectors participating in a series of lectures by Associate Professor Gustaaf Hallegraeff (an international expert on toxic algal blooms), Ms Melissa Gladstone (an algal monitoring expert from New Zealand), Dr Colin Johnson (a fish health expert from PIRSA Aquaculture) and Dr Judi Marshall (curator of the harmful algal collection at the University of Tasmania, who also facilitated the course).

As the Aquafin CRC Coordinator, I was pleased to see at the conclusion of the workshop worldwide monitoring systems being analysed to determine methods that may be adapted to the tuna and yellowtail kingfish farms and it was very exciting to see industry working together to achieve a common goal. I felt that industry had gained valuable information and confidence in being able to identify potentially threatening algal species, how to sample correctly and report appropriately, ensuring the companies who participated have an improved emergency response plan to an algal outbreak. I think it also made the participants more aware that if they work together they can protect themselves better than if they continue with individual efforts.

The format of the workshop was excellent. Theory was reinforced by a series of practical exercises on algal identification and a workshop on how to conduct a fish autopsy by preparing and storing samples correctly.”

# APPENDIX IX

## Training and Education Providers

# **APPENDIX X**

## **Industry Associations**

# APPENDIX XI

## Government Incentives and Programs

## COMMONWEALTH INITIATIVES – PROGRAMS, GRANTS AND FUNDING SCHEMES

Information regarding the following funding schemes can be found at: [www.dest.gov.au](http://www.dest.gov.au) or the Office of Training and Tertiary Education on 03-96372333 or at: [www.otte.vic.gov.au](http://www.otte.vic.gov.au)

- Abstudy
- Austudy
- Australian Post-Graduate Awards
- Commonwealth Learning Scholarships
- Commonwealth Development Education Program (CDEP)
- Commonwealth Education Costs Scholarships (CECS)
- Commonwealth Accommodation Scholarships (CAS)
- Indigenous Researchers Development Scheme
- Indigenous Education Direct Assistance Program (IEDA)
- Postgraduate Education Loans System (PELS)
- Research Fellowships

The following Commonwealth initiatives can be found at the designated websites:

- Agriculture Advancing Australia – Farm Help – [www.daff.gov.au](http://www.daff.gov.au)
- Export Market Development Training – [www.daff.gov.au/youngleaders](http://www.daff.gov.au/youngleaders)
- National Food Industry Strategy (NFIS) Food Chain Program – [www.nfis.com.au/strategy/foodchain](http://www.nfis.com.au/strategy/foodchain)
- Indigenous Employment – [www.wageassistance.gov.au](http://www.wageassistance.gov.au)
- National Womens Development Program – [www.osw.dpmc.gov.au](http://www.osw.dpmc.gov.au)
- New Apprenticeships – [www.newapprenticeships.gov.au](http://www.newapprenticeships.gov.au)
- New Enterprise Incentive Scheme (NEIS) – [www.workplace.gov.au/neis](http://www.workplace.gov.au/neis)
- Seafood Industry Training Package (SITP) – [www.seafoodtraining.com.au](http://www.seafoodtraining.com.au)
- Pooled Development Fund (PDF Program) – [www.ausindustry.gov.au](http://www.ausindustry.gov.au)
- Rural Industries Research & Development Corporation (RIRDC) Rural Womens Award – [www.ruralwomensaward.gov.au](http://www.ruralwomensaward.gov.au)
- Young People’s Improved Corporate Governance - [www.daff.gov.au/youngleaders](http://www.daff.gov.au/youngleaders)
- Young Peoples Study Awards - [www.daff.gov.au/youngleaders](http://www.daff.gov.au/youngleaders)
- Young Rural Leaders’ Course - [www.daff.gov.au](http://www.daff.gov.au)

## OTHER

The following book, "The Fish Book", was published in September 2003 by the Department of Agriculture, Fisheries & Forestry (DAFF) in association with the Australian Seafood Industry Council and Seafood Services Australia. The Fish Book is a guide to the Australian Government programs, funding schemes, grants and services available to the Australian Seafood Industry and is definitely worth reading when the question of what funds are available for the aquaculture industry is asked.

The following two websites also detail government initiatives:

[www.grantslink.gov.au](http://www.grantslink.gov.au)

[www.grantsearch.com](http://www.grantsearch.com)

## STATE INITIATIVES – PROGRAMS, GRANTS AND FUNDING SCHEMES

The following state initiatives can be found at the designated websites or by calling the number given. The given initiatives are by no means an exhaustive list; the websites given at the start of this document should be regularly checked for new funding schemes.

### VICTORIA

- Managed Individual Pathways (MIP) – [www.sofweb.vic.edu.au/voced/mips](http://www.sofweb.vic.edu.au/voced/mips)
- Youth Pathways Program (YPP) – [www.sofweb.vic.edu.au/voced/ypp](http://www.sofweb.vic.edu.au/voced/ypp)

### QUEENSLAND

- The Private Sector Start Up Program -1300363079

### NEW SOUTH WALES

- Womens Development Program – (Close May for 2004) 03-62715198
- Environmental Trust Funding
- Foundation for Rural & Regional Renewal (FRRR) Annual Funding Program – [www.frrr.org.au](http://www.frrr.org.au)
- Young Australian's Grant Program – [www.youngaustralians.org](http://www.youngaustralians.org)
- Indigenous Small Business Fund – [www.workplace.gov.au](http://www.workplace.gov.au)
- Environmental Program Grants – (Closed for 2004)
- Macquarie Bank Foundation – [www.macquarie.com.au](http://www.macquarie.com.au)
- NSW Regional Assistance – [www.busines.nsw.gov.au](http://www.busines.nsw.gov.au)

## **WESTERN AUSTRALIA**

- Small Business Smart Business Program -1800093340
- Professional Development Support Program (PDSP) – [www.training.wa.gov.au/initiatives](http://www.training.wa.gov.au/initiatives)
- Read Write Now – [www.training.wa.gov.au/initiatives](http://www.training.wa.gov.au/initiatives)
- Science and Technology Innovation Fund - [www.training.wa.gov.au/initiatives](http://www.training.wa.gov.au/initiatives)
- For Apprenticeships and Traineeships in WA – 131954

## **SOUTH AUSTRALIA**

- Regional South Australia – Training for School-leavers & Unemployed – 08-82262364
- South Australia New Apprenticeship System – [www.newapprenticeships.gov.au](http://www.newapprenticeships.gov.au)
- Literacy & Numeracy program -08-82262364
- Ticket to Training (Closed for 2004) – 08-82263401

## **NORTHERN TERRITORY**

- Chief Ministers Study Award for Women – 08-89993730 or [www.women.nt.gov.au](http://www.women.nt.gov.au)
- NT Government Bursaries & Scholarships – 08-89011309
- New Apprenticeships in the Northern Territory – [www.newapprenticeships.gov.au](http://www.newapprenticeships.gov.au)

## **TASMANIA**

- TASTA Training Awards – [www.opcet.tas.gov](http://www.opcet.tas.gov)