FINAL REPORT

Aquatic Animal Health Subprogram: strategic planning, project management and adoption

Eva-Maria Bernoth

June 2004

FRDC Project No. 2001/093

Australian Government
Department of Agriculture, Fisheries and Forestry

Australian Government
Fisheries Research and Development Corporation

Eva-Maria Bernoth

Aquatic Animal Health Subprogram: strategic planning, project management and adoption.

The Fisheries Research and Development Corporation plans, invests in and manages fisheries research and development throughout Australia. It is a federal statutory authority jointly funded by the Australian Government and the fishing industry.

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TABLE OF CONTENTS

NON-TECHNICAL SUMMARY

2001/093	Aquatic Animal Health Subprogram: strategic planning, project management and adoption

PRINCIPAL INVESTIGATOR: Eva-Maria Bernoth *Dr med vet*

ADDRESS:

Aquatic Animal Health

Office of the Chief Veterinary Officer

Australian Government Department of Agriculture, Fisheries and Forestry

PO Box 858

Canberra ACT 2601

Telephone: 02 6272 4328 Fax: 02 6273 5237

OBJECTIVES:

1. Coordinate the FRDC Subprogram Aquatic Animal Health (project applications, workshops, communication) including the Program Activities funded under the AG-DAFF/FRDC Agreement for the delivery of Program Activities under the *Building a National Approach to Animal and Plant Health* program.
2. Set strategic directions for aquatic animal health R&D in Australia.
3. Facilitate the dissemination of information on, and results from, aquatic animal health.

NON TECHNICAL SUMMARY:

OUTCOMES ACHIEVED TO DATE

The overall outcome of this project has been the successful facilitation, administration and promotion of the FRDC Aquatic Animal Health Subprogram (AAH Subprogram) over the three-year period from 2001 to 2004. The AAH Subprogram was established to provide a cohesive and national approach to aquatic animal health research and development in Australia, and it has truly met this objective.

The AAH Subprogram has managed a total of fifty projects, the majority of which were supported through the Australian Government's Budget Initiative *Building a National Approach to Animal and Plant Health*. Through these projects, the AAH Subprogram has delivered improved diagnostic capability and ten Standard Diagnostic Techniques for priority aquatic animal diseases; twenty-one AQUAVETPLAN aquatic animal disease emergency management manuals or other training resources; and ten training exercises to enhance the disease emergency management capability of industry and government personnel. All of these outputs have significantly enhanced Australia's capability to be prepared for, and respond to, aquatic animal disease emergencies.

All AAH Subprogram projects were developed following a dedicated stakeholder consultation process, ensuring relevance as well as avoiding duplication of the research conducted. The AAH Subprogram's quarterly newsletter *Health Highlights* reported on progress made in these projects.

In October 2002, the AAH Subprogram developed and launched the "AQUATIC ANIMAL HEALTH SUBPROGRAM Strategic Plan 2002-2007" to guide the Subprogram to fulfill its objectives to provide leadership, direction and focus for aquatic animal health research and development (R&D) and other related non-R&D activities. The Plan was updated in mid 2003 to reflect the outcomes of an aquatic animal health foresighting workshop.

The 1st Scientific Conference of the Subprogram was held in October 2003. Over forty aquatic animal health specialists, including representatives from the Australian Government, State governments, universities and other academic institutions, participated in the conference. The conference played an important part in the communication function of the Subprogram, with a large proportion of its projects discussed. Links to other interested parties such as the Aquafin CRC and Australia's National Aquatic Animal Health Technical Working Group were enhanced. Furthermore, the conference provided an opportunity for the younger aquatic animal health specialists, the newcomers in the field, to develop their networks.

In summary, stakeholder comments show that a key strength of the AAH Subprogram has been its strategic focus and the establishment of a network of aquatic animal health experts and research providers. Further, the AAH Subprogram has provided an industry-based structure through which to develop and maintain strategic direction for investment in aquatic animal health.

KEYWORDS: **aquatic animal health; disease**

ACKNOWLEDGMENTS

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BACKGROUND

AQUAPLAN

Australia's fisheries and aquaculture industries are a rapidly growing sector of our primary industries. Their capacity to contribute through export earnings and job creation especially in regional Australia is a vital part of our future prosperity. Because ‘disease’ is a regular business risk especially for aquaculture enterprises, absence of disease – or ‘health’ – contributes to the overall profitability of such enterprises. Australia is fortunate to have our aquatic animal sector free from many diseases that occur elsewhere in the world, and this provides us with a comparative advantage in both production and trade. Often, the ‘disease-free’ status in aquatic animals is a prerogative for trade, e.g. in salmonid eggs with Northern hemisphere countries. Australia's capacity to produce ‘clean green’ seafood of superior quality allows ready access to overseas markets, enhances competitiveness and also provides value adding through the capacity to attract premium prices. ‘Health’ in the sense of public health is important to maintain – and preferably increase – consumer confidence and credibility of the entire industry, be it wild catch or aquaculture produce.

Recognising the critical importance of health for the aquatic animal sector, Australia’s governments and private industries as well as the recreational fishing sector in 1998 signed on to ‘AQUAPLAN’, our National Strategic Plan for Aquatic Animal Health 1998-2003 (Commonwealth of Australia, 1999).

The then Fish Health Management Committee (FHMC) was the body which oversaw the development of AQUAPLAN. The Australian Chief Veterinary Officer, Dr Gardner Murray, chaired FHMC. Membership comprised representatives from the Fisheries and Aquaculture Branch (Australian Government Department of Agriculture, Fisheries and Forestry – AG-DAFF), the then Standing Committees on Agriculture and Resource Management and on Fisheries and Aquaculture, CSIRO Australian Animal Health Laboratory (CSIRO-AAHL), the Australian Seafood Industry Council (ASIC), recreational fisheries (RecFish Australia), the National Aquaculture Council (NAC) and representatives from the peak aquaculture industry bodies of Australia. Since 1998, stakeholders reviewed AQUAPLAN Programs annually to assess progress with current projects and reprioritise the work for the next financial year.

AQUAPLAN Program 6 – Research and Development

One of AQUAPLAN's eight programs was Program 6 ‘Research and Development'. Its highest priority was the development of a strategic R&D plan for health management. A collaborative approach between research providers and the beneficiaries at a national level had repeatedly been confirmed by stakeholders as crucial to ensure research priorities are addressed with a minimum of duplication.

The establishment of an AAH Subprogram was discussed at FHMC Workshops; it was suggested that such a Subprogram could usefully develop the strategic plan for aquatic animal health research and coordinate research on relevant projects. In 1999, FHMC representatives and FRDC staff prepared a document outlining the establishment of a Subprogram.

At the Third AQUAPLAN Workshop in May 2000 in Canberra, attended by the FRDC, participants endorsed the idea of a new AAH Subprogram. It was acknowledged that whilst 'health' was frequently linked to other areas such as genetics, nutrition, and the environment, the primary focus of the proposed Subprogram would be the role of pathogens in aquatic animal health. The linkage of the Subprogram to AQUAPLAN Program 6 was noted, including the opportunity to find a 'home' for health R&D for infant industries and new aquaculture species. The need to develop an FRDC Subprogram proposal was confirmed as a priority project on the AQUAPLAN Workplan 2000-01.

A subgroup of FHMC developed a pre-proposal to FRDC on *The Establishment of an FRDC Subprogram for Aquatic Animal Health*. The pre-proposal was viewed positively by the FRDC Board at their August 2000 meeting. Fisheries Research Advisory Bodies (FRABs) were informed of these proceedings.

Federal Budget Initiative *Building a National Approach to Animal and Plant Health*

The concept of an AAH Subprogram received even more attention with the announcement of the 2000-01 Federal Budget Initiative *Building a National Approach to Animal and Plant Health* (FBI), which allocated funds over 4 years specifically to address aquatic animal health infrastructure and emergency management. An agreement between AG-DAFF and the FRDC was signed; the FRDC would administer approximately $3m of the FBI funds under four Program Activities *Diagnostics*, [*Joint industry/government] Aquatic Animal Health Body*, *Emergency Management Planning*, and *Emergency Management Training and Incident Simulation*. Detailed Program Activity Plans were to be developed by the FRDC who would be advised by FHMC and its AQUAPLAN Business Group (ABG; chaired by ASIC and NAC) on sector priorities and project options. These plans would be submitted to the FBI Advisory Committee where the aquatic sector was represented by the chair of ASIC. After approval, the FRDC would need to commence a process of identifying discrete projects to implement the program activities; an AAH Subprogram was viewed by FRDC, AG-DAFF and FHMC as the most sensible and feasible avenue for these activities.

Existing FRDC Programs, Subprograms and projects on aquatic animal health

Between 1992 and 2000, the FRDC contributed approximately $6 million to 32 projects on aquatic animal health 'proper'. Some of those projects linked to FRDC Subprograms, e.g. Rock Lobster Enhancement & Aquaculture, Rock Lobster Post-harvest, and Abalone Aquaculture.

The new Subprogram was to be lodged under FRDC Program 1 'Natural Resources Sustainability', with strong linkages to FRDC Program 2 'Industry Development', especially Strategies 2-1: Aquaculture development; 2-4: Legislative, institutional, compliance and policy arrangements and their impacts; 2-5: Market development; and 2-7: Quality, food safety and consumer health. It would also link to Program 3 'Human Capital Development' e.g. via Strategy 3.4: Community education, and contribute to Program 4 'Management and Accountability' via the Strategies 4-1: Fisheries R&D leadership; 4-2: Strategic investment; and 4-4: Communication and extension of results. Species-specific health-

related projects would fall under the management of the pertinent species-specific Subprogram where it exists.

FRDC Sub-Program Health – how it fits into present and future planned research

A survey conducted in late 2000 by AG-DAFF's Aquatic Animal Health Unit identified a total of 90 current or recently completed research projects on aquatic animal health, whereof 32 received FRDC funding. In terms of numbers of projects, the FRDC was therefore the biggest research investor in aquatic animal health Australia. Other research providers included the CRC for Aquaculture, the Australian Centre for International Agricultural Research, and AG-DAFF's Fisheries Resources and Research Fund. Additional research projects were funded by State departments, academic institutions and CSIRO.

The importance of aquatic animal health was unlikely to decline over the next years, rather it could be assumed to increase, with new species being developed for aquaculture, a process inevitably leading to detection of 'new' diseases. At the May 2000 AQUAPLAN Workshop, stakeholders reconfirmed the priority need to develop a strategic R&D plan for aquatic animal health to prevent duplication and increase cooperation amongst researchers. They agreed that such a plan could usefully be developed by a dedicated, nationally representative Subprogram on aquatic animal health under the FRDC.

The FBI funds specifically targeted four areas of aquatic animal health, i.e. *Diagnostics*, [*Joint industry/government] Aquatic Animal Health Body*, *Emergency Management Planning*, and *Emergency Management Training and Incident Simulation*. Apart from *Diagnostics*, these would not be research projects in the narrower sense of the word; rather they would build up or strengthen aquatic animal health infrastructure and emergency response capability and capacity. On the other hand, there are several 'traditional' R&D areas in aquatic animal health that were not covered by the FBI, for example, vaccines and chemotherapeutants, or surveillance and monitoring for aquatic animal diseases. The AAH would manage the FBI projects as well R&D projects, thus enabling a truly integrated and coordinated approach.

The anticipated integration of the Subprogram into continuing funding for AQUAPLAN in general, for specific activities such as surveillance and monitoring in particular, and – most importantly – for disease response and compensation arrangements needed to be resolved with highest priority. The fundamental question was the mechanism to secure such funds in the long term. Therefore, participants at the Third AQUAPLAN Workshop in May 2000 unanimously identified the need to progress deliberations on the establishment of a joint industry/government umbrella body as the key priority issue. A draft Research and Funding Consultancy document was developed and circulated for endorsement to FHMC members as well as to a wider group of stakeholders. Comments were received and integrated into a revised, comprehensive document that itemised the Terms of Reference and the time lines for the consultancy; the final version of the document was endorsed by the then Standing Committee on Fisheries and Aquaculture. The consultancy was tendered in October 2000, a successful applicant selected, and the work commenced 13 November 2000. FBI monies supported the consultancy and the resulting deliberations.

It was anticipated that one of the consultancy's final outcomes would be the suggestion to either establish a new body (specific for the aquatic animal sectors), the joining of an existing body (e.g. Animal Health Australia), or following the 'Horticulture Model' approach (destatutorising the respective R&D Corporation). With a joint industry/government body being formed, FHMC, ABG, and, indeed, part of the Subprogram's activities (e.g.

prioritisation of research) might become redundant, however, negotiations were not expected to lead to fully functional arrangements within the next two years.

NEED

Overseas experience demonstrates how diseases reduce profitability, sustainability and competitiveness of aquatic animal industries. Despite a rapid and continuous expansion in aquaculture, Australia has not experienced significant disease emergencies in farmed aquatic animal populations. However, pilchard mortality events in 1995 and 1998 have provided warning signals and demonstrated the need to increase our capability to respond to – and preferably prevent – aquatic animal disease outbreaks.

Since 1992, the FRDC as the biggest research investor has contributed more than $11million to over fifty projects related to aquatic animal health. Due to project diversity and cross-linkages to several FRDC Programs and existing Subprograms, well-facilitated project management is a fundamental requirement to ensure efficiency and effectiveness in delivering and extending results and would be facilitated by a dedicated Subprogram with its leader and supporting infrastructure.

With the development of a strategic R&D plan for aquatic animal health as a highest priority task, the Subprogram would contribute to preventing duplication of research, increase cooperation amongst researchers and thus achieve one of AQUAPLAN's key priority objectives. It would thus underpin stability in aquatic animal health research and provide a greater level of service to research output beneficiaries.

The FRDC Subprogram would not only manage traditional R&D projects, but also develop Program Activity Plans and deliver projects under an AG-DAFF/FRDC Agreement (*[…] for the delivery of Program Activities under the* Building a National Approach to Animal and Plant Health *program)*. FRDC would be advised by FHMC's ABG, chaired by ASIC and NAC, fulfilling the role of the Subprogram steering committee. Thus, the national approach could be developed in tandem to the R&D strategy, and guaranteeing links among the two. Significant components of the AQUAPLAN Workplan could be achieved.

OBJECTIVES

1. Coordinate the FRDC Subprogram Aquatic Animal Health (project applications, workshops, communication) including the Program Activities funded under the AG-DAFF/FRDC Agreement for the delivery of Program Activities under the *Building a National Approach to Animal and Plant Health* program.
2. Set strategic directions for aquatic animal health R&D in Australia.
3. Facilitate the dissemination of information on, and results from, aquatic animal health.

METHODS

The methods used in the planning, management and adoption of R&D are described in the Subprogram's Strategic R&D Plan (APPENDIX 4) and its Communication and Extension Plan (APPENDIX 5). The Strategic Plan also provides details on membership on the Subprogram's Steering Committee (STC) and Scientific Advisory Committee (STC).

RESULTS/DISCUSSION

Objective 1: Coordinate the FRDC Subprogram Aquatic Animal Health (project applications, workshops, communication)

The scope of the AAH Subprogram has been 'health' with a focus on infectious diseases. The AAH Subprogram was responsible for coordinating research projects funded under the following 2 separate components:

FRDC R&D projects

The AAH Subprogram adopted a special responsibility for health-related project applications originating in industry sectors where there was no specific subprogram. In particular the AAH Subprogram managed health-related projects on new or emerging aquaculture species ('orphan species').

In situations where a species-specific aquaculture subprogram existed (e.g. Atlantic Salmon Aquaculture, Southern Bluefin Tuna Aquaculture, Abalone Aquaculture, Rock Lobster Enhancement and Aquaculture), these subprograms remained responsible for the prioritisation and management of any health related projects involving those specific species. The AAH Subprogram provided advice on these health related projects where necessary.

The preferred process for submission and assessment of such applications was as follows:

1. The pre-proposal or full application was submitted to the species-specific subprogram who assessed its need and priority.
2. If supported by the species-specific subprogram, the pre-proposal or full application was forwarded to the AAH Subprogram for advice on technical feasibility and merit.
3. The full application gained support from both subprograms before submission to the FRDC Board for final assessment.

If approved, the project was then managed by the species-specific subprogram; the AAH Subprogram provided advice on milestone reports and the final report as required.

The AAH Subprogram followed the FRDC's standard operating procedures for project development, assessment, approval and management, especially regarding communication with other subprograms and FRABs.

Calls for R&D preliminary applications ('preproposals') were circulated to potential research providers in June 2001, 2002 and 2003. Preproposals had to be submitted to the AAH Subprogram within a 4-week deadline and were assessed by STC and SAC. Applicants were advised of the evaluation and ranking by letter. All applicants received detailed advice. The ranking was copied to all FRABs and the other subprograms for information.

STC and SAC assessed draft full applications subsequently received. Again, applicants were advised of the evaluation and ranking by letter. All applicants received detailed advice. The ranking was copied to all FRABs and the other subprograms for information.

Federal Budget Initiative *Building a National Approach to Animal and Plant Health*

This comprised aquatic animal health projects in the following 4 program areas:

1. *Diagnostics*
2. *Emergency management planning*
3. *Emergency management training and incident simulation*
4. *Establishment of a joint industry/ government body for aquatic animal health management*

On behalf of the FRDC, the AAH Subprogram administered these programs, as per an Agreement between AG-DAFF and the FRDC. The FBI funds expired on 30 June 2004.

The AAH Subprogram developed its own operating procedures in line with the AG-DAFF-FRDC Agreement and the relevant corporate governance and business rules. Because the FBI had its own associated advisory structure, namely the STC and SAC, there was no reason for such applications to be processed through the FRABs, particularly so for non-R&D applications (e.g. the production of AQUAVETPLAN manuals). It also meant that applications could be developed independently of the regular FRDC R&D cycle.

In the first year, i.e. in April 2001, the AAH Subprogram leader approached over fifty industry stakeholder groups with a call for identification of diagnostic priorities for aquatic animal health under the FBI *Diagnostics* program. A pro-forma had previously been developed, assisting stakeholders in this process. A draft database on the currently available diagnostic capability for aquatic animal diseases in Australia was also provided. The call for priorities was copied to State and Territory governments, FRABs and other FRDC subprograms. STC and SAC assessed and shortlisted the identified priorities. Proponents were informed of the decisions, a set of project specifications was developed, and calls for expressions of interest were disseminated widely and openly throughout Australia, including all known and potentially interested researchers, FRABs and the other FRDC subprograms. Full project applications were invited for end of July 2001. STC and SAC then evaluated full project applications for the FBI *Diagnostics* program, and research proponents and the FRDC as well as subprograms and FRABs (where appropriate) were informed of the key outcomes.

For the second year, stakeholder consultation commenced in December 2001, on priorities for programs *Emergency Management Planning* and *Emergency Management Training and Incident Simulation*. The process described above was followed.

Early in 2002 it became apparent that some FBI funds remained uncommitted. The 2002 National Fish Pathologists'[1] workshop convened in early June 2002 by the Office of the Australian Chief Veterinary Officer and hosted by the Tasmanian Department of Primary Industries, Water and Environment brought together 27 aquatic animal health specialists, mostly from governments, who assisted the AAH Subprogram with identifying priority issues. On the basis of the Workshop's recommendations, STC and SAC developed a strategy of how to expedite commitment of funds. The strategy was subsequently commented upon and approved by the FRDC Executive Director. The strategy consisted of three avenues:

[1] In 2003, this forum became the National Aquatic Animal Health Technical Working Group – NAAH-TWG.

a) soliciting applications for additional and clearly identified priority projects;
b) considering 'regular' R&D applications for funding under the FBI; and
c) quarantining some funds to guarantee delivery on outputs from existing projects, pending a technical audit planned for October 2003.

Following this strategy, the Subprogram developed additional applications that were assessed and evaluated by STC and SAC in October and November 2002.

Given that the FBI funds expired on 30 June 2004, there were no general calls for new applications during 2003. Rather, the recommendations made by the 2002 workshop were followed up and pertinent applications solicited following the strategy approved by the FRDC Executive Director in late 2002.

Meetings

The meetings that STC and SAC held during the life-span of this project are listed in Table 1 below:

Table 1: Subprogram meetings

Meeting # (Date)	Face-to-face / teleconference	Location (if face-to-face meeting)	In conjunction with
STC-02[2] 28.03.2001	Face-to-face	Adelaide	Fish Health Management Committee-12
STC-03 4.06.2001	Teleconference	N/a	N/a
STC-04 16.08.2001	Face-to-face	Brisbane	4th Annual AQUAPLAN Stakeholder Workshop
STC-05 30.11.2001	Face-to-face	Brisbane	Seafood Directions; FHMC-13
STC-SAC-06 15.02.2002	Face-to-face	Melbourne	-
STC-SAC-07 9.04.2002	Face-to-face	Melbourne	Subprogram Strategic Planning Workshop
STC-SAC-08 12.06.2002	Teleconference	N/a	N/a
STC-SAC-09 25.07.2002	Face-to-face	Adelaide	FHMC-14
STC-SAC-10 22.8.2002	Teleconference	N/a	N/a
STC-SAC-	Face-to-face	Hobart	Subprogram Expert

[2] The first meeting of the group – then still under the name of ABG – was held in 2000

Meeting # (Date)	Face-to-face / teleconference	Location (if face-to-face meeting)	In conjunction with
11 17.10.2002			Consultation on *Pfiesteria;* FRDC Board meeting #64
STC-SAC-12 21.11.2002	Teleconference	N/a	N/a
STC-SAC-13 17.02.2003	Face-to-face	Canberra	-
STC-SAC-14 6.06.2003	Face-to-face	Perth	NAAH-TWG annual meeting 2003
STC-SAC-15 27.08.2003	Face-to-face	Brisbane	Subprogram Scientific Conference planning meeting
STC-SAC-16 20.10.2003	Face-to-face	Melbourne	-
STC-SAC-17 30.04.2004	Face-to-face	Canberra	-

Projects

Through the above-described processes, the Subprogram developed and managed 49 individual projects. One additional project was 'inherited'. Project numbers are listed in Table 2 below, and project titles and names of principal investigators are given in APPENDIX 6.

Table 2: Number of Subprogram projects

Subprogram area	Number of projects
R&D projects	6
FBI projects – *Diagnostics*	10
FBI projects – *Emergency management planning*	21
FBI projects – *Emergency management training and incident simulation*	10
FBI projects – *Establishment of a joint industry/ government body for aquatic animal health management*	3
Total number of projects	**50**

Objective 2: Set strategic directions for aquatic animal health R&D in Australia.

Commencing in early 2002, the AAH Subprogram conducted a thorough stakeholder consultation process on the preparation of a Strategic Plan for the Subprogram. Following

initial consultation with individual stakeholders, a workshop with 20 participants was convened in April 2002. The resulting draft Strategic R&D Plan was circulated to aquatic animal health research providers, the FHMC, the Aquaculture Committee, the then Veterinary Committee, other FRDC subprograms, FRABs and the FRDC Executive Director for comment by mid June 2002.

Because of the scant feedback received, the topic was placed on the agenda for the National Fish Pathologists'[3] workshop in Launceston in June 2002 that was convened with 27 aquatic animal researcher providers. There was debate about whether the need was for a specific R&D plan, rather than the tabled document which was more like a statement of 'guiding principles', but there was also acknowledgement that this may prove difficult because of the geographic spread of host species, the number of host species, and the multitude of health aspects. The Subprogram decided that a significant re-write of the draft was not required, however, that the document was to be a Strategic Plan rather than Strategic R&D Plan. After endorsement of the final version by stakeholders, the Strategic Plan was circulated widely with the clarification that it is not a compilation of R&D priorities. In October 2002, the AAH Subprogram developed and launched the "AQUATIC ANIMAL HEALTH SUBPROGRAM Strategic Plan 2002-2007" to guide the Subprogram to fulfill its objectives to provide leadership, direction and focus for aquatic animal health research and development (R&D) and other related non-R&D activities.

The Strategic Plan was updated in mid 2003 to *inter alia* reflect the outcomes of the NAAH-TWG foresighting workshop conducted in June 2003. Because discrete key research areas were identified, the Strategic Plan then was renamed as the AAH Subprogram's Strategic R&D Plan (APPENDIX 4).

Objective 3: Facilitate the dissemination of information on, and results from, aquatic animal health

Activities have been undertaken in full compliance with the AAH Subprogram's Communication and Extension Plan (APPENDIX 5).

Immediately after establishment of the AAH Subprogram, an STC 'industry stakeholder register' was established to facilitate consultation with the commercial fishing and aquaculture industry. Recreational fishing and government stakeholder registers were also used. All registers were continuously updated.

The first issue of the AAH Subprogram's own newsletter, *Health Highlights*, was produced and published in October 2001. Since then, *Health Highlights* has been produced quarterly and has been distributed widely to stakeholders via hard copies, electronic mail outs, and placing onto the AAH Subprogram's Website. Feedback on Health Highlights has been extremely encouraging. Use was also made of AG-DAFF's AQUAPLAN Newsletters and the FRDC R&D News.

The AAH Subprogram developed its own web pages off the FRDC website (http://www.frdc.com.au/research/programs/aah/index.htm) in 2002.

The Subprogram leader made face-to-face presentations about the AAH Subprogram at many meetings, workshops and conferences (see Table 3).

Table 3: Face-to-face presentations by the AAH Subprogram leader on the AAH Subprogram

[3] In 2003, this forum became the National Aquatic Animal Health Technical Working Group – NAAH-TWG.

Date	Forum
24 July 2002	FHMC-14, Adelaide
17-19 April 2002	FRDC FRAB and Subprogram Workshop, Canberra
4-6 June 2002	NAAH-TWG annual workshop, Launceston
27-29 September 2002	AQUAFEST Conference, Hobart
20 July 2002	Australian Barramundi Farmers Association's AGM, Sydney
25-26 March 2003	Primary Industries and Resources South Australia – Annual Animal Health Conference, Port Lincoln
5 June 2003	Western Australian Aquaculture Development Council, Perth
2-5 June 2003	NAAH-TWG annual workshop, Fremantle
30 July 2003	Meeting of the Aquaculture Industry Action Agenda Implementation Committee, Melbourne
31 July 2003	Aquatic Animal Health Committee Meeting 02, Melbourne

In addition, individual project principal investigators made a significant number of presentations at scientific conferences and local industry meetings; with almost 50 projects, those presentations are too numerous to be listed here.

The single most important event was the 1st Scientific Conference of the AAH Subprogram, held in Geelong (Victoria) in October 2003. Over forty aquatic animal health specialists, including representatives from the Australian Government, State governments, universities and other academic institutions, participated in the conference. Ron Stagg – an international expert from the Fisheries Research Services, Marine Laboratory, Aberdeen, Scotland – had been invited and made three well-received keynote presentations on the outbreak of infectious salmon anaemia in Scotland and the control strategies applied. The conference played an important part in the communication function of the Subprogram, with a large proportion of its projects discussed. Links to other interested parties such as the Aquafin CRC and NAAH-TWG were enhanced. Furthermore, the conference provided an opportunity for the younger aquatic animal health specialists, the newcomers in the field, to develop their networks. The Conference proceedings were published on CD Rom.

There was unanimous consensus that regular scientific meetings are extremely useful, and various options for the future were discussed.

BENEFITS AND ADOPTION

The AAH Subprogram has delivered improved diagnostic capability for pilchard herpesvirus and an additional ten Standard Diagnostic Techniques (SDTs) for priority aquatic animal diseases; twenty-one AQUAVETPLAN aquatic animal disease emergency management manuals or other training resources; and ten training exercises to enhance the disease emergency management capability of industry and government personnel. Whilst the considerable benefits of disease simulation exercises are already being appreciated by the pertinent industry sectors and governments, all SDTs and the majority

of manual outputs are yet to be formally endorsed through a process that has commenced in mid 2004.

- All SDTs will be submitted for endorsement to NAAH-TWG and then entered into the professional editing and publishing process under Australia's Sub-Committee on Animal Health Laboratory Standards. They will ultimately be available as Australia and New Zealand Standard Diagnostic Procedures, with the first ones expected to be published in late 2004.
- Similarly, many of the AQUAVETPLAN manuals will be submitted to NAAH-TWG and its parent body, the Aquatic Animal Health Committee (AAHC) for comment and endorsement before they formally become a part of AQUAVETPLAN through endorsement by Australia's Primary Industries Standing Committee (PISC). The first of this series has been submitted to PISC for endorsement at their September 2004 meeting. In addition, the update or *de novo* production of State-specific Control Centre Management Manuals has been supported with AAH Subprogram monies, and these manuals have been endorsed by individual jurisdictions. Other resources such as the *Aquatic Animal Health Subprogram: exotic disease training manual*, the *Australian Aquatic Animal Disease Identification Field Guide (2nd edition),* and the *Aquatic Animal Disease Emergencies Video And Training Kit Disease Watch – Play your Part* have all been completed, and their availability will be announced in the next issue of *Health Highlights.*.

The series of disease simulation exercises culminated in *Exercise Tethys,* the world-first multi-jurisdictional disease simulation exercise in the aquatic area. An outcome report was prepared, with a set of broad recommendations that aim to improve pre-existing frameworks and resources in order to develop more robust communication systems and procedures for an aquatic animal disease emergency response. The report also includes recommendations specific to the operating systems and procedures within individual jurisdictions. *Exercise Tethys* also highlighted other concerns including the need to address compensation cost sharing issues within the aquaculture industry. The report has been submitted to PISC for endorsement at their September 2004 meeting.

Other courses supported through Subprogram projects were a training course on exotic diseases of aquatic animals, education and training on the Consultative Committee on Emergency Animal Diseases process, and the AAH Subprogram Scientific Conference 'Emergency Disease Response Planning and Management' (see above).

Through further projects, the AAH Subprogram facilitated the establishment of AAHC as the primary industry-government interface for aquatic animal health in Australia (endorsed by PISC in September 2002). Other projects identified the most suitable mechanism to compensate aquaculture farmers for financial losses associated with government-ordered compulsory destruction of stock due to an outbreak of an emergency disease.

In summary, and as anticipated in the project application, the commercial fisheries sector (including aquaculture) as well as the recreational sector, the Australian Government and State/Territory governments as well as researchers and students have all benefited from the AAH Subprogram. The STC Joint Chairs' Report and the SAC's Report on the benefits of the AAH Subprogram are appended (APPENDICES 7 and 8).

FURTHER DEVELOPMENT

To date, Australia has been relatively disease-free and suffered few major national emergencies. Ironically, there is the danger that such enviable status leads to complacency and a false sense of security. For example, with aquaculture industries intensifying over the next years to reach the production target of $2.5 billion by 2010 (ACIL, 1999), disease problems will inevitably become more significant, a correlation amply experienced in other intensive livestock industries. 'Disease' translates into reduced profitability, but may not always be caused by mass mortality: Reduced growth of animals, reduced overseas market access because of loss of 'free' status, or reduced domestic market access because of a loss of image, may all contribute.

Whilst the incursion of an exotic disease outbreak is readily perceived as a risk in this context, the potential impact of endemic diseases is often not adequately considered. Endemic diseases that are not accepted as business risks and are poorly managed will reduce profitability when intensification increases. Translocation of live animals – another likely feature of a growing industry – poses increased disease risks, for example, when brood stock of unknown health status are taken from the wild, or animals are reared outside their usual range. This could be particularly important for, but is by no means restricted to, the commercial development of 'new' species for aquaculture.

In this context it is noteworthy that the very absence of many serious diseases and the resulting justification for sanitary measures regarding imports have led to the questioning by overseas trading partners of the significance of uniquely Australian pathogens or disease conditions, requiring enhanced surveillance, monitoring and biosecurity assessments. *De facto* trade barriers, based on our lack of understanding of our own diseases, will continue to be imposed and must provide an incentive to Australia to not only improve basic research knowledge on endemic disease agents but more critically to improve the quality control and thus international acceptance of our diagnostic and surveillance capacity.

The draft new AQUAPLAN 2005-2010 strategy states:

- "Whilst AQUAPLAN 2005-2010 features seven discrete strategies, there are several themes that are common to all of them, including the recognition of the need for research and the adaptability of the plan to include emerging aquaculture industries.
- "Compared to the terrestrial animal industries, the state of knowledge of aquatic animal health management is limited. Research has a critical role in expanding this knowledge and enhancing management practices to prevent disease or limit its impact on the aquaculture industries….".

These are important areas of responsibility for a new AAH Subprogram. Indeed, it is difficult to perceive a more suitable mechanism to ensure the coordinated delivery and extension of relevant aquatic animal health R&D than a Subprogram dedicated to aquatic animal health.

PLANNED OUTCOMES

The overall planned outcome of the facilitation, administration and promotion of an AAH Subprogram was an increased ability to manage aquatic animal disease in the commercial, recreational and traditional fishing industry sectors. The AAH Subprogram would thus help Australia's aquaculture and fisheries industries become more competitive, profitable and sustainable, as well as assist in ensuring that the natural resources on R&D

investments would focus on priorities identified by industries and governments. The three fishing industry sectors as well as the Australian community at large would benefit from this outcome.

- This overall outcome was achieved through outputs produced under the FBI areas of the Subprogram, that is through improved diagnostic capability for pilchard herpesvirus and an additional ten priority aquatic animal diseases; twenty-one AQUAVETPLAN manuals or other training resources; and ten training exercises to enhance the disease emergency management capability of industry and government personnel. The outcome's aspect of "priorities identified by industries and governments" was guaranteed through the industry-chaired structure of a Subprogram Steering Committee, supported by a Scientific Advisory Committee.

A primary justification for the AAH Subprogram was the need to manage the wide scope of aquatic animal health R&D as reflected by a large number of projects on a diverse range of issues. Ensured efficiency and effectiveness in delivering and extending R&D results was specified as a sub-outcome, with streamlined administration and management, an increased level of cooperative research, and improved access to research results suggested.

- All these goals have been achieved: The very composition of STC and SAC and their linkages to other bodies – such as the AQUAFIN CRC, the strategic, joint industry/government committee AAHC and its scientific working group NAAH-TWG – greatly assisted R&D prioritisation (and also prevented duplication – see below).
- Effective and efficient running of the AAH Subprogram was possible through development of, and adherence to, strict operational procedures, especially when the AAH Subprogram became the biggest-ever of the FRDC's subprograms, due to the 'cash injection' of FBI funds.
- With fifty projects managed by the AAH Subprogram, synergies between individual projects were easy to detect and were usefully translated into cooperation that may – without this structure – have not otherwise occurred.
- Extension of R&D results was achieved through a proactive communication strategy, with the newsletter *Health Highlights* and the AAH Subprogram Conference being the two most successful avenues. *Health Highlights* in particular won the AAH Subprogram considerable publicity within – but also outside – the circle of FRDC's research providers, and even overseas.

Preventing duplication of aquatic animal health research constituted another rationale for an AAH Subprogram. As a sub-outcome, strategic directions were to be developed, agreed upon and maintained.

- This was achieved through the consultative process that led to the launch in 2002 of the AAH Subprogram's Strategic Plan, updated in 2003. Linkages to NAAH-TWG proved especially constructive in this respect.

A third need for the AAH Subprogram was the administration of FBI funds.

- These monies fully supported the overall outcome by enhancing aquatic animal health infrastructure and emergency preparedness and response capability and capacity. Corporate governance and relevance of delivery of the FBI program were ensured by placing their management into the AAH Subprogram.

CONCLUSION

The AAH Subprogram was established by the FRDC in mid 2001 to provide a cohesive and national approach to aquatic animal health research and development in Australia, and in particular to address AQUAPLAN Program 6: Research and Development. It has truly met these objectives.

The AAH Subprogram has managed a total of fifty projects, the majority of which were supported through the Australian Government's Budget Initiative *Building a National Approach to Animal and Plant Health*. Through these projects, the AAH Subprogram has delivered improved diagnostic capability and ten Standard Diagnostic Techniques for priority aquatic animal diseases; twenty-one AQUAVETPLAN aquatic animal disease emergency management manuals or other training resources; and ten training exercises to enhance the disease emergency management capability of industry and government personnel. All of these outputs have significantly enhanced Australia's capability to be prepared for, and respond to, aquatic animal disease emergencies.

All AAH Subprogram projects were developed following a dedicated stakeholder consultation process, ensuring relevance as well as avoiding duplication of the research conducted. The AAH Subprogram's quarterly newsletter *Health Highlights* reported on progress made in these projects.

In October 2002, the AAH Subprogram developed and launched the "AQUATIC ANIMAL HEALTH SUBPROGRAM Strategic Plan 2002-2007" to guide the Subprogram to fulfill its objectives to provide leadership, direction and focus for aquatic animal health research and development (R&D) and other related non-R&D activities. The Plan was updated in mid 2003 to reflect the outcomes of an aquatic animal health foresighting workshop.

The 1st Scientific Conference of the Subprogram was held in October 2003. Over forty aquatic animal health specialists, including representatives from the Australian Government, State governments, universities and other academic institutions, participated in the conference. The conference played an important part in the communication function of the Subprogram, with a large proportion of its projects discussed. Links to other interested parties such as the Aquafin CRC and NAAH-TWG were enhanced. Furthermore, the conference provided an opportunity for the younger aquatic animal health specialists, the newcomers in the field, to develop their networks.

In summary, stakeholder comments show that a key strength of the AAH Subprogram has been its strategic focus and the establishment of a network of aquatic animal health experts and research providers. Further, the AAH Subprogram has provided an industry-based structure through which to develop and maintain strategic direction for investment in aquatic animal health.

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Commonwealth of Australia. 1999. *AQUAPLAN – Australia's National Strategic Plan for Aquatic Animal Health 1998-2003*. Agriculture, Fisheries, Forestry – Australia, Canberra. 34pp. www.daff.gov.au/aquaticanimalhealth

APPENDIX 1: INTELLECTUAL PROPERTY

This project has not developed any intellectual property that requires legal protection.

APPENDIX 2: STAFF

Principal Investigator (Subprogram leader):	Eva-Maria Bernoth
Subprogram Coordinator:	Iska Sampson (May 2001 – January 2003)
	Kristy Nelson (February 2003 – June 2004)

APPENDIX 3: ACRONYMS AND ABBREVIATIONS

AAH Subprogram	[FRDC] Aquatic Animal Health Subprogram
AAHC	Aquatic Animal Health Committee
ABG	AQUAPLAN Business Group
AG-DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
ASIC	Australian Seafood Industry Council
CRC	Cooperative Research Centre
CSIRO-AAHL	Commonwealth Scientific and Industrial Research Organisation – Australian Animal Health Laboratory
FBI	Federal Budget Initiative *Building a National Approach to Animal and Plant Health*
FHMC	Fish Health Management Committee
FRAB	Fisheries Research Advisory Body
FRDC	Fisheries Research and Development Corporation
NAAH-TWG	National Aquatic Animal Health Technical Working Group
NAC	National Aquaculture Council
PISC	Primary Industries Standing Committee
R&D	Research and Development
SAC	[AAH Subprogram] Scientific Advisory Committee
SDT	Standard Diagnostic Technique
STC	[AAH Subprogram] Steering Committee

APPENDIX 4: AAH SUBPROGRAM – STRATEGIC R&D PLAN 2002-2007 (UPDATED VERSION JULY 2003)

Aquatic Animal Health Subprogram
Strategic Research and Development Plan
2002 – 2007
(Update July 2003)

Prepared by:
FRDC Aquatic Animal Health Subprogram
Edited by:
Dr Eva-Maria Bernoth, Aquatic Animal Health Subprogram Leader
Kristy Nelson, Aquatic Animal Health Subprogram Coordinator

TABLE OF CONTENTS

1 Introduction

This strategic R&D plan ('the Plan') of the Fisheries Research and Development Corporation's Aquatic Animal Health Subprogram ('the Subprogram') will guide the Subprogram to fulfill its objectives to provide leadership, direction and focus for aquatic animal health research and development (R&D) and other related non R&D activities. The Plan will assist the Subprogram in assessing aquatic animal health project applications. A compilation of current R&D priorities is included.

This strategic R&D plan is a 'working document'. It has been developed for a five-year period (2002-2007) after which a full review will be conducted.

However, the Plan will also be reviewed annually and amended accordingly.

The Plan:

- Outlines the background to the establishment of the Subprogram;
- Describes the Subprogram including its role, objectives, structure and funding basis;
- Describes criteria used in defining a project under the Subprogram;
- Outlines the key research areas;
- Will be used by the Subprogram to assist in assessing animal health project applications;
- Lists current R&D priorities; and
- Will be reviewed annually with wide stakeholder consultation.

2 Background

Australia's fisheries and aquaculture are the fastest growing sectors of our primary industries in terms of both job creation and average growth in production, currently running at 13% growth p.a. Their capacity to contribute through export earnings and job creation especially in regional Australia is a vital part of our future prosperity. Australia is fortunate to have our aquatic animal sector free from many diseases that occur elsewhere in the world, and this provides us with a comparative advantage in both production and trade. Australia's capacity to produce 'clean green' seafood of superior quality allows ready access to overseas markets, enhances competitiveness and also provides value adding through the capacity to attract premium prices.

It is vital for Australia to maintain this relative disease free status. Industry and government have recognised the importance of an integrated and planned approach on aquatic animal health. This led to the cooperation between industry and government in developing AQUAPLAN, Australia's five year National Strategic Plan for Aquatic Animal Health. AQUAPLAN is a comprehensive document describing initiatives ranging from border controls and import certification through to enhanced veterinary education and improved capacity to manage incursions of exotic diseases. The eight programs described in this plan represent a world first in proactive management of aquatic animal health.

In addition, Australia has a unique and poorly understood endemic parasite flora and fauna which is becoming of increasing importance and concern to our export trade. Examples include the internationally reportable gill associated virus and spawner-isolated mortality virus in prawns, and QX disease (*Marteilia sydneyi*) in oysters. This concern over endemic diseases and the lack of surveillance and diagnostic services has already compromised attempts to export live shellfish to the European Union. Such trade barriers, based on our lack of understanding of our own diseases, will continue to be imposed and provide an incentive to Australia to not only improve basic

research knowledge on endemic disease agents but more critically to improve the quality control and thus international acceptance of our diagnostic and surveillance capacity.

3 Aquatic Animal Health Subprogram

The Subprogram was established by the Fisheries Research and Development Corporation (FRDC) in mid 2001 to provide a cohesive and national approach to aquatic animal health research and development in Australia, and in particular to address AQUAPLAN Program 6: Research and Development. The Subprogram has a national focus, consistent with international obligations.

3.1 Mission

"To provide leadership to aquatic animal health R&D and its adoption in Australia".

3.2 Objectives

The Subprogram's key objectives are to:

1. Provide leadership, coordination, management and planning for aquatic animal health R&D;
2. Set and review national priorities of aquatic animal health research; and
3. Oversee the communication, extension and adoption of results of aquatic animal health research projects.

3.3 Role

The role of the Subprogram is to:

- Implement the Subprogram strategic R&D plan;
- Set R&D priorities to maximise investment in aquatic animal health, avoid duplication and achieve the greatest potential return;
- Invite R&D applications to address those priorities;
- Maximise collaboration between researchers, and between researchers, fisheries managers and fishing industry interests;
- Attract other R&D funding and influence the way in which other funding entities apply their investments in that field;
- Standardise on the best scientific methods;
- Communicate regularly with potential beneficiaries; and
- Influence the adoption of R&D results.

3.4 Outcomes

The Subprogram's activities will contribute to:

1. Reduced risk of a major disease impact on Australia's fisheries resources;
2. Improved productivity and profitability of the fishing and aquaculture sectors;
3. Market access/biosecurity/meeting international obligations;
4. Improved standard/productivity of research and analysis;
5. Cost-effective research and analysis; and

6. Increased awareness of aquatic animal health issues.

3.5 Scope and links with other FRDC subprograms

The scope of the Subprogram is 'health' with a focus on infectious diseases. The Subprogram adopts a special responsibility for health-related project applications originating in industry sectors for which there is no specific subprogram. In particular the Subprogram would manage health-related projects on new or emerging aquaculture species ('orphan species').

In situations where a species-specific aquaculture subprogram exists[4], these subprograms would be responsible for the prioritisation and management of any health related projects involving those specific species. The Subprogram would provide advice on these health related projects where necessary.

The preferred process for submission and assessment of such applications is as follows:

4. The pre-proposal or full application should be submitted to the species-specific subprogram[1] who would assess its need and priority.
5. If supported by the species-specific subprogram, the pre-proposal or full application would be forwarded to the Subprogram for advice on technical feasibility and merit.
6. The full application should gain support from both subprograms before submission to the FRDC Board for final assessment.
7. If approved, the project would then be managed by the species-specific subprogram; the Subprogram would provide advice on milestone reports and the final report as required.

3.6 Scope and links with other bodies

The Subprogram consults on health R&D priorities and strategies with the Aquatic Animal Health Committee (AAHC) which was established in late 2002 as the primary industry/government interface for policy, communication and awareness related to aquatic animal health, thereby superseding the Fish Health Management Committee (FHMC). Consultation is primarily through AAHC's technical and scientific support body, the National Aquatic Animal Health – Technical Working Group (NAAH-TWG).

3.7 Steering Committee

The Steering Committee (STC) comprises both government and industry representatives. When established in 2001, its composition was deliberately identical to the then FHMC's AQUAPLAN Business Group (ABG) to ensure linkages to AQUAPLAN Program 6 (R&D) as well as to the FRDC and greatly reduced administrative overheads. FHMC was disbanded in 2002 and superseded by the AAHC (see above).

Amongst the key tasks of the STC are:

- To develop a strategic R&D plan with key performance measures and timeframes. This should be regularly reviewed.
- To ensure that research objectives are commercially focused and outcome driven.
- To coordinate industry and research provider involvement to maximise usage of available resources.

[4] E.g. Atlantic Salmon Aquaculture, Southern Bluefin Tuna Aquaculture, Abalone Aquaculture, Rock Lobster Enhancement and Aquaculture

- To facilitate industry extension and technology transfer.

STC members

- *Industry members:* Simon Bennison[5] (joint chair)
  Russ Neal[6] (joint chair)
  Pheroze Jungalwalla[7]
  Brian Jeffriess[8]
- *Government Members:* Jim Gillespie[9]
  Eva-Maria Bernoth[10]
- *FRDC member:* Patrick Hone[11]

3.8 Scientific Advisory Committee

The Scientific Advisory Committee (SAC) consists of a small core group that may co-opt additional scientists as needed. The SAC members were chosen so that a Commonwealth laboratory as well as a State laboratory are represented and a formal linkage to the Health Program in the 'CRC for Sustainable Aquaculture of Finfish' (AQUAFIN CRC) is guaranteed.

Amongst the key tasks of the SAC are:

- To scientifically assess new research proposals, *inter alia* to ensure that the research proposed is scientifically feasible, and to advise the STC on new funding applications.
- To advise on scientific problems with project progress as well as identify remedial action, to ensure scientific objectives and milestones are met.
- To foster and develop collaboration amongst researchers.
- To facilitate research extension and technology transfer.

SAC members

- Mark Crane[12]
- Brian Jones[13]
- Barbara Nowak[14]

4 Stakeholders

The key stakeholders in the Subprogram, i.e. those beneficiaries that have the greatest stake in the success of the Subprogram and with whom the Subprogram consults to identify aquatic animal health R&D needs, are (alphabetical order):

- Australian Seafood Industry Council

[5] National Aquaculture Council
[6] Australian Seafood Industry Council
[7] Tassal Limited
[8] Tuna Boat Owners Association
[9] Queensland Fisheries Service
[10] Agriculture, Fisheries and Forestry - Australia
[11] Programs manager, Fisheries Research and Development Corporation
[12] CSIRO Livestock Industries
[13] Department of Fisheries, Government of Western Australia
[14] Aquafin CRC, University of Tasmania

- Commonwealth Department of Agriculture, Fisheries and Forestry – Australia
- Aquatic Animal Health Committee
- FRDC
- Major aquaculture industries (salmon, tuna, edible oysters, pearls, prawns)
- National Aquaculture Council
- RecFish Australia
- Research providers
- State/Territory Departments of Fisheries/Natural Resources/Agriculture

It is acknowledged that the list of beneficiaries is much longer, including e.g. the post-harvest industry, the ornamental fish industry, conservation interests, indigenous groups, pharmaceutical companies, research investors, extension services, consumers of seafood, and the public at large.

5 Budget

The Subprogram was established with an indicative budget of $1.5 million over a three-year period.

6 *Methods*

The Subprogram fulfils its role by:

- Being accountable for actions outlined in this strategic R&D plan;
- Adopting a proactive approach to aquatic animal health;
- Adopting a holistic approach to aquatic animal health;
- Adopting clear directions and processes;
- Providing a focal point for research;
- Promoting a collaborative/cooperative R&D environment;
- Advocating the importance of aquatic animal health; and
- Communicating with Fisheries Research Advisory Bodies (FRABs) and other FRDC subprograms on:
  - ⇒ Research pre-proposals and full project applications received by the Subprogram – informing and seeking comment by FRABs/subprograms;
  - ⇒ Subprogram assessment of research pre-proposals and full applications; and
  - ⇒ Advice sought on health related pre-proposals and full applications submitted to FRABs or other subprograms.

The STC and SAC assist the Subprogram in fulfilling its role and managing its projects.

6.1 FRDC R&D projects

The Subprogram follows the FRDC's standard operating procedures for project approval and management, especially regarding communication with other subprograms and FRABs.

6.2 Meeting Objectives

The Subprogram achieves its three key objectives through the following methods:

Objective 1: Provide leadership, coordination, management and planning for aquatic animal health R&D

A) Planning

- Establishment and annual review of strategic R&D plan (update; identify gaps)

B) Development of applications

- Commissioned, unsolicited or forwarded (by FRDC, FRABs or other subprograms)

C) Assessment of applications

- Determine whether application fits criteria[15] (if not, provide advice/expertise/leadership)
- Evaluate need
- Evaluate feasibility
- Determine overall priority (against other applications)

D) Application funding

- Identify appropriate funding body/ies

E) Project management facilitation

- Assessment and execution of projects
- Communication/extension of results
- Encourage/facilitate adoption of results

F) Governance

- Reporting/accountability (FRDC)
- Structure (STC; SAC – expertise based)

H) Linkages

- Establish strategic alliances

Objective 2: Set and review national priorities of aquatic animal health research

- Establish R&D priorities in consultation with stakeholders, e.g. through the annual workshops of NAAH-TWG
- Annual update of strategic R&D plan
- Full review of strategic R&D plan every 5 years

Objective 3: Oversee the communication, extension and adoption of results of aquatic animal health research projects

Develop a communication strategy that includes:

- *Health Highlights* (Subprogram newsletter)
- Scientific workshops
- Website
- Provide scientific advice and communication to other subprograms and FRABs regarding aquatic animal health research pre-proposals, applications, projects and results

[15] See 7.1 below

- Databases e.g. the Australian Aquatic Animal Health Information System (AAAHIS)

7 Research and Development

This section outlines the criteria used to determine whether a project falls under the Subprogram. Key research areas for the Subprogram are listed as a guide for applicants in developing projects for funding under the Subprogram.

7.1 Criteria

The following criteria are used to define a project under the Subprogram:

- Exotic or endemic aquatic animal disease of potential infectious aetiology, with potential or existing significant impact on Australian fisheries and aquaculture (includes also capture fisheries, recreational fisheries, indigenous fisheries and/or aquatic ecosystems);
- Emergency disease of national significance (e.g. based on Australia's *National List of Reportable Diseases of Aquatic Animals*);
- Addresses gaps in existing aquatic animal health research and contributes to the future understanding of aquatic animal diseases and their control (including diseases of new or potential species for aquaculture);
- Facilitates collaborative research to avoid duplication or gaps;
- Facilitates capacity development within Australia;
- Identified as a stakeholder priority (including industry, government and research stakeholders).

7.2 Key research areas

When developing project applications for funding through the Subprogram, the outcomes of the project should address at least one of these key research areas. Discrete RD priorities for the next years are listed under the pertinent areas.

7.2.1 Nature of disease and host-pathogen interaction

- Improved knowledge of the biology of disease agents (including epizootiology, taxonomy of pathogens, morphology, pathophysiology, histology, toxicology, etc)
- Improved knowledge on the host response to disease agents (aquatic animal immunology and immunomodulators)
- R&D to underpin knowledge about new and emerging diseases of significance
- R&D to underpin knowledge about disease risk associated with ornamental fish and recreational fishing.

PRIORITIES

- Midcrop mortality syndrome / Mourilyan virus / gill-associated virus / spawner-isolated mortality virus
- Herpesvirus and iridovirus infections in ornamental fish
- *Perkinsus* infections
- Parasitic protozoans
- Immunology in aquatic vertebrates

- Immunology of aquatic invertebrates
- Evaluate host-pathogen interactions for intractable diseases and identify risk factors to develop disease minimisation strategies

7.2.2 Aquatic animal health management

- R&D to underpin risk analyses (including disease risk minimisation procedures for exported and imported aquatic animals and products)
- R&D to facilitate inter-jurisdictional harmonisation of domestic and international approaches (common tests, common protocols [e.g. translocation], common certification)
- Development of protocols, methods and operational instruments to manage emergency aquatic animal disease outbreaks in Australia
- Methods of aquatic animal product treatments to prevent spread of disease (sterilisation, disinfection and decontamination)

PRIORITIES

- Risk assessment on the escape of live pathogens from abalone farms
- Risk assessment on the escape of live pathogens from ornamental fish to farmed fish
- Impact of micro-and macro-nutrition on immune health and expression of disease
- Immunomodulators to enhance vaccine efficacy
- Development of standard protocols to evaluate vaccine efficacy under farm conditions
- Development of probiotics for the control of disease or improved health of hatchery and farmed aquatic animals
- Identify and assess stress factors in molluscs to develop health management strategies for on-farm and post harvest stock

7.2.3 Endemic and exotic aquatic animal disease diagnostics

- Review and assessment of existing screening and diagnostic tests, and those under development
- Development of case definitions and diagnostic criteria
- Development and validation of screening tests and diagnostic tests
- Facilitate transfer of knowledge and technology in aquatic animal diagnostics

PRIORITIES

- Initiation of an aquatic animal component of the National Registry of Domestic Animal Pathology (or equivalent)
- Diagnostics for endemic iridovirus (tropivirus group – ornamental and farmed fish) (epizootic haematopoietic necrosis reference laboratory)
- Development of diagnostic tests for economically important diseases of ornamental fish, both enzootic and exotic
- Evaluation of flavobacteria as pathogens of aquatic animals and development of a practical diagnostic system for their identification

7.2.4 Surveillance and monitoring

- Support projects to enhance existing surveillance and monitoring programs and those under development
- Research into aquatic animal disease surveillance methodology
- R&D to underpin disease control programs, translocation, zoning, surveillance and monitoring, and risk analyses in relation to disease organisms

PRIORITIES

- Distribution and impact of iridovirus (epizootic haematopoietic necrosis virus) in wild stocks of native fish and introduced redfin perch
- Distribution of iridovirus (epizootic haematopoietic necrosis virus) in farmed salmonids in New South Wales, Victoria and Western Australia
- Random/structured surveillance of ornamental fish on release from quarantine
- Development of base line data of blood/haemolymph parameters and common diseases for all endemic Australian species under culture
- Development of tools for immune status monitoring as a means of implementing health management strategies
- Evaluation of causes leading to apparent increased virulence of disease agents
- Development of a national guidelines/strategy framework to ensure effective passive surveillance of aquatic animals, especially those under culture.
- Application of diagnostic tools for disease forecasting for improved health management strategies.

7.2.5 Best practice/national and international quality assurance

- Quality assurance (QA) and proficiency testing (e.g. white spot disease, epizootic haematopoietic necrosis, histology slides and nodavirus)
- R&D to underpin development of QA standards
- Facilitate the establishment of laboratory proficiency testing in detecting infectious diseases

PRIORITIES

- Continue ring testing for white spot virus
- Ring testing for viral encephalopathy and retinopathy, epizootic haematopoietic necrosis, and crayfish plague
- Inclusion of aquatic specimens into the ‘slide of the month’ series for histopathologists
- Identification of key factors for the development of Regional Codes of Best Practice for Health e.g. biosecurity for feed boats, dive teams, disposal of blood water etc.
- Development of interpretation guidelines for antibiotic sensitivity testing for bacterial pathogens of aquatic animals in Australia
- Evaluation of chemotherapeutic treatments for specific aquatic animal use and development of treatment best practices

7.2.6 Training and capacity building

- Human capital development – including training and capacity building for aquatic animal health specialists/veterinarians.
- Facilitate the development of training and extension tools
- Sustain and further develop technical skill base in aquatic animal health
- Facilitate R&D knowledge transfer in aquatic animal health

PRIORITIES

- Assessment of national capacity in aquatic animal health
- Development of resources for undergraduate education in aquatic animal health at Australian veterinary schools
- A continued focus on organised, continuing education with particular reference to aquatic animal health and aquatic animal pathology for veterinarians at undergraduate, post graduate and specialist levels
- Specialist training programs for microbiologists providing diagnostic services for aquatic animal health
- Consolidation of knowledge and capability for parasitology of aquatic animals
- Development and maintenance of databases and related resources for diseases and pathology of aquatic animals in Australia

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8 Further information

- **Aquatic Animal Health Subprogram website:**

Go to the FRDC website www.frdc.com.au and follow the links:

Research and Development -> Subprograms -> Aquatic Animal Health Subprogram

- **Agriculture, Fisheries and Forestry – Australia website: www.affa.gov.au**
- **Contacts Aquatic Animal Health Subprogram:**

Dr Eva-Maria Bernoth, Leader
Aquatic Animal Health Subprogram
Ph: 02 6272 4328 Fx: 02 6273 5237
Email: eva-maria.bernoth@affa.gov.au

Kristy Nelson, Coordinator
Aquatic Animal Health Subprogram
Ph: 02 6272 5283 Fx: 02 6273 5237
Email: kristy.nelson@affa.gov.au

- **Postal Address:**

C/o Aquatic Animal Health, Office of the Chief Veterinary Officer
Agriculture, Fisheries and Forestry – Australia GPO Box 858 Canberra ACT 2601

APPENDIX 5: AAH SUBPROGRAM – COMMUNICATION AND EXTENSION PLAN

FRDC Aquatic Animal Health Subprogram: strategic planning, project management and adoption (2001/093)

Communication and Extension Plan

Objectives

1. To consult with stakeholders regarding the development and review of a strategic R&D plan for aquatic animal health in Australia.
2. To report key outcomes of this Subprogram's R&D projects to stakeholders.
3. To consult with stakeholders on priorities for the Subprogram's Federal Budget Initiative – funded programs (*ie*. *Aquatic animal health body*; *Diagnostics*; *Emergency management planning*; *Emergency management training and incident simulation*).
4. To report key outcomes of the Subprogram's Federal Budget Initiative – funded programs to stakeholders.
5. To collate and disseminate information on other aquatic animal health research – related issues.

Target Audiences

1. Commercial fisheries and aquaculture sector (via key industry associations).
2. Recreational fishing sector (via RecFish Australia).
3. State and Territory governments (via the relevant department in each jurisdiction).
4. Aquatic animal health researchers in Australia, New Zealand, and other o/s countries.
5. Providers of aquatic animal health – related research in Australia (*eg*. Academia; AQUAFIN CRC; ACIAR; FRRF; ICAR; IAC…).
6. Other FRDC Subprograms, FRABs, and the FRDC.
7. Private companies / consultants potentially interested in delivery on some of the projects.
8. The wider public, via open mailing lists.

Key Messages

1. Australia is addressing aquatic animal health in a strategic manner. Australia is the only country world-wide to have a national, joint industry/government strategic plan for aquatic animal health. This plan is called AQUAPLAN, and it encompasses R&D as one of its eight key programs.
2. One of the 8 AQUAPLAN programs is focussed on aquatic animal health R&D. The FRDC Aquatic Animal Health subprogram works towards achieving the main objectives of this AQUAPLAN program, that is, to identify research priorities in the field of aquatic animal health and aquatic animal disease management, and to promote research and development in these areas by industry and government.

3. The FRDC Aquatic Animal Health subprogram delivers a strategic R&D plan for aquatic animal health, which will be continuously updated to reflect research achievements as well as changing R&D needs
4. The FRDC Aquatic Animal Health subprogram delivers standardised diagnostic techniques and standard operating procedures for priority aquatic animal diseases, to enhance Australia's capability to quickly and reliably diagnose infectious disease agents and respond to disease outbreaks in a timely manner.
5. The FRDC Aquatic Animal Health subprogram delivers AQUAVETPLAN manuals to enhance Australia's preparedness to respond to aquatic animal disease emergencies.
6. The FRDC Aquatic Animal Health subprogram provides training in emergency management and incident simulation.

Communication/Extension Methods

1. The key means of communication and extension of results is the Subprogram Newsletter *'Health Highlights'*. The Newsletter will be the primary means for regular 'newsy' communication with as wide a range of stakeholders as possible. The Subprogram leader is responsible for timely production and distribution of each issue of the Newsletter. The Newsletter will be produced quarterly. It will be distributed by a three-tiered approach: by electronic mail to a list of interested stakeholders; by posting it on the FRDC Website, and by sending hard copies upon request. Stakeholders will be able to subscribe and unsubscribe to the electronic mailing list and will be asked to forward information in order to further encourage subscription and widen the dissemination.
2. Other vehicles for communication will be used as appropriate, *eg*. the FRDC 'R&D News', or the AFFA 'AQUAPLAN Newsletters'.
3. The Subprogram's Scientific Advisory Committee will submit a project application to the FRDC to hold annual scientific conferences of the Subprogram. These would provide an excellent vehicle to communicate with researchers directly. It is intended to hold such conferences back-to-back with other workshops/meetings, firstly to reduce overhead costs, but secondly to increase potential exposure of research results, and provide the opportunity to address specific for a (*eg*. industry meetings). The extension method would be presentations by researchers at those scientific conferences / industry meetings and the publication of proceedings from the conferences.
4. Each project managed by the Subprogram has its own Communication and Extension Plan, usually including scientific publications by researchers as yet another means to extend results. All publications originating with projects managed via the Subprogram will be approved in writing by the Subprogram Leader prior to distribution and release.
5. Reports will be provided to the FRDC (and key stakeholders, as appropriate) on issues arising from steering committee and scientific committee meetings.

Action Plan

During Project

Method	Responsibility	**Completion Date**
Subprogram Newsletter	Principal Investigator (=Subprogram leader)	Every quarter, first edition by 30 September 2001
Draft R&D Plan	Principal Investigator (=Subprogram leader)	30 September 2001

Final R&D Plan	Principal Investigator (=Subprogram leader)	30 June 2002
Submission of final report to FRDC	Principal Investigator	30 June 2004

After Project

Method	Responsibility	**Completion Date**
Disseminate note on the availability of the Final Report	FRDC	3 months after completion of project

Evaluation

1. Monitor the number of requests for information on the Subprogram and/or its projects.
2. Monitor subscription to Health Highlights.
3. Assess the percentage of research project applications that are clearly linked to the Subprogram's R&D Plan.
4. Measure the level of support by industry in terms of contributions to projects managed by the Subprogram.

Eva-Maria Bernoth
Principal Investigator

[Prepared October 2001]

APPENDIX 6: AAH SUBPROGRAM PROJECTS

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
Research & Development				
1999/226	Aquatic Animal Health Subprogram: generation of diagnostic reagents for pilchard herpes virus	Bryan Eaton CSIRO Livestock Industries AAHL	December 1999	December 2002
2001/093	Aquatic Animal Health Subprogram: strategic planning, project management and adoption	Eva-Maria Bernoth Australian Government Department of Agriculture, Fisheries and Forestry	May 2001	July 2004
2001/214	Aquatic Animal Health Subprogram: Aquatic Animal Health subprogram: development of a disease zoning policy for *Marteilia sydneyi* to support sustainable production, health certification and trade in Sydney rock oyster	Robert Adlard Queensland Museum	December 2001	June 2005
2002/043	Aquatic Animal Health Subprogram: the production of nodavirus-free fish fry and the nodaviruses' natural distribution	Ian Anderson Department of Primary Industries, Queensland	December 2002	June 2005
2002/044	Aquatic Animal Health Subprogram: pilchard herpes virus infection in wild pilchards	Brian Jones Department of Fisheries, Government of WA	January 2003	December 2005
2003/216	Aquatic Animal Health Subprogram: Detection and management of Kingfish health issues in the Yellowtail Kingfish (*Seriola lalandi*) industry - the foundation for a health programme for Australian finfish aquaculture	Martin Hernen South Australian Marine Finfish Farmers Association Inc	June 2003	October 2004
Federal Budget Initiative: Diagnostics				
2001/620	Aquatic Animal Health Subprogram: development of improved procedures for the identification of aquatic birnaviruses	Ken McColl CSIRO Livestock Industries AAHL Fish Diseases Laboratory	November 2001	February 2004

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2001/621	Aquatic Animal Health Subprogram: molecular diagnostic tests to detect epizootic ulcerative syndrome (*Aphanomyces invadans*), and crayfish plague (*Aphanomyces astaci*) (April 2002 – March 2004)	Nicky Buller Department of Agriculture, WA	April 2002	August 2004
2001/624	Aquatic Animal Health Subprogram: development of diagnostic procedures for the detection and identification of *Piscirickettsia salmonis*	Mark Crane CSIRO Livestock Industries AAHL Fish Diseases Laboratory	November 2001	April 2004
2001/625	Aquatic Animal Health Subprogram: development of diagnostic capability for priority aquatic animal diseases of national significance: spawner-isolated mortality virus	Leigh Owens School of Biomedical Sciences James Cook University	March 2002	April 2004
2001/626	Aquatic Animal Health Subprogram: development of diagnostic tests for the detection of nodavirus	Nick Moody Queensland Department of Primary Industries & Fisheries	April 2002	July 2004
2001/628	Aquatic Animal Health Subprogram: vibrios of aquatic animals: development of a national standard diagnostic technology	Jeremy Carson Tasmanian Department of Primary Industries, Water & Environment	October 2001	August 2004
2001/630	Aquatic Animal Health Subprogram: validation of DNA-based (PCR) diagnostic tests suitable for use in surveillance programs for *Marteilia sydneyi* infection of rock oysters (*Saccostrea glomerata*) in Australia	Robert Adlard Queensland Museum	April 2002	August 2003
2003/620	Aquatic Animal Health Subprogram: establishment of diagnostic expertise for detection and identification of red sea bream iridovirus (RSIV)	Mark Crane CSIRO Livestock Industries AAHL Fish Diseases Laboratory	January 2004	December 2005
2003/621	Aquatic Animal Health Subprogram: development of diagnostic and reference reagents for epizootic haematopoietic necrosis virus of finfish	Richard Whittington University of Sydney	January 2003	August 2004

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2003/622	Aquatic Animal Health Subprogram: development of molecular diagnostic expertise for the mollusc pathogen *Bonamia* sp	Serge Corbeil CSIRO Livestock Industries AAHL Fish Diseases Laboratory	October 2003	August 2004
Federal Budget Initiative: Manuals and Planning				
2002/640	Aquatic Animal Health Subprogram: production of AQUAVETPLAN disease strategy manual for viral haemorrhagic septicaemia	Paul Hardy Smith Panaquatic Health Solutions	November 2002	June 2004
2002/641	Aquatic Animal Health Subprogram: crayfish plague disease strategy manual	Fran Stephens Aquatilia Healthcare	July 2002	June 2004
2002/643	Aquatic Animal Health Subprogram: viral encephalopathy and retinopathy a disease strategy manual	Richard Miller IDEXX Laboratories	July 2002	December 2003
2002/645	Aquatic Animal Health Subprogram: exotic disease training manual	Shane Raidal Murdoch University	July 2002	July 2004
2002/647	Aquatic Animal Health Subprogram: production of an AQUAVETPLAN disease strategy manual for white spot disease of all WSV-susceptible crustaceans	Chris Baldock AusVet Animal Health Services	August 2002	January 2004
2002/651	Aquatic Animal Health Subprogram: Whirling Disease – Disease Strategy Manual	Paul-Hardy Smith Panaquatic Health Solutions	October 2002	June 2004
2002/652	Aquatic Animal Health Subprogram: enhancement of the emergency disease management capability in Victoria - developing a Victorian Control Centre Management Manual	Anthony Forster Fisheries Victoria	October 2002	January 2004

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2002/653	Aquatic Animal Health Subprogram: AQUAVETPLAN aquatic disease disinfection manual	Kevin Ellard Livestock & Aquaculture Veterinary Consulting Services	October 2002	September 2004
2002/654	Aquatic Animal Health Subprogram: development of a training course on exotic diseases of aquatic animals.	Ken McColl CSIRO Livestock Industries AAHL Fish Diseases Laboratory	September 2002	July 2004
2002/655	Aquatic Animal Health Subprogram: design and organisation of a multi-state disease emergency simulation exercise	Iain East Australian Government Department of Agriculture, Fisheries and Forestry	November 2002	January 2004
2003/640	Aquatic Animal Health Subprogram: subprogram conference 'emergency disease planning and management	Mark Crane CSIRO Livestock Industries AAHL Fish Diseases Laboratory	March 2003	May 2004
2003/641	Aquatic Animal Health Subprogram: development of the control centre manual for managing aquatic disease emergencies in Queensland	Tiina Hawkesford Queensland Department of Primary Industries & Fisheries	March 2003	July 2004
2003/642	Aquatic Animal Health Subprogram: revision and expansion of the Australian aquatic animal disease identification field guide for publishing to CD Rom	Alistair Herfort Australian Government Department of Agriculture, Fisheries and Forestry	March 2003	August 2004
2003/643	Aquatic Animal Health Subprogram: development of a brief for the production and delivery of an aquatic animal disease awareness and training kit	Niall Byrne Byrne Young Communications	January 2003	March 2003
2003/644	Aquatic Animal Health Subprogram: NSW Control Centres Manual (CCM) Aquatic Emergencies	Damian Ogburn NSW Fisheries	April 2003	July 2004
2003/645	Aquatic Animal Health Subprogram: aquatic animal disease emergencies – video and training kit	Wayne Tindall Big Time Media	July 2003	December 2004

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2003/646	Aquatic Animal Health Subprogram: Australian aquatic animals diseases and pathogens database	Gus Boman F1 Solutions	June 2003	August 2004
2003/647	Aquatic Animal Health Subprogram: development of a database for Australian diagnostic laboratory expertise for diseases of aquatic organisms	Iain East Australian Government Department of Agriculture, Fisheries and Forestry	July 2003	September 2003
2003/648	Aquatic Animal Health Subprogram: the revision of the Tasmanian fish health plan and incorporation into the Tasmanian control centre manual	Mary Lou Conway Department of Primary Industries, Water and Environment, Tasmania	May 2003	June 2004
2003/649	Aquatic Animal Health Subprogram: industry's emergency preparedness and response to mass mortality of Yellowtail Kingfish (*Seriola lalandi*): Development of plans, and protocols	Mark Sheppard Sakana Veterinary Services Ltd.	August 2003	January 2005
2003/650	Aquatic Animal Health Subprogram: update of the AQUAVETPLAN enterprise manual (semi-open systems)	Jo Sadler	June 2003	September 2003
Federal Budget Initiative: Training				
2001/660	Aquatic Animal Health Subprogram: enhancement of emergency disease management capability in the Queensland Department of Primary Industries and the redclaw crayfish (*Cherax quadricarinatus*) industry	Iain East Australian Government Department of Agriculture, Fisheries and Forestry	September 2001	April 2002
2002/660	Aquatic Animal Health Subprogram: enhancement of emergency disease management through the education and training of the CCEAD participants on the CCEAD process	Linda Walker Australian Government Department of Agriculture, Fisheries and Forestry	July 2002	March 2004
2002/661	Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of NSW and Qld Government agencies and industry bodies associated with oyster culture	Matt Landos NSW Fisheries	October 2002	August 2004

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2002/664	Aquatic Animal Health Subprogram: aquatic animal health emergency management training and incident simulation	Melanie Ryan Seafood Training (SA)	October 2002	August 2004
2002/665	Aquatic Animal Health Subprogram: enhancement of the emergency disease management capability in Victoria - adapting the AQUAVETPLAN control centre management manual	Anthony Forster Fisheries Victoria	October 2002	July 2004
2002/666	Aquatic Animal Health Subprogram: training course on exotic diseases of aquatic animals	Mark Crane CSIRO Livestock Industries AAHL Fish Diseases Laboratory	July 2002	July 2004
2002/668	Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of Department of Fisheries and industry bodies associated with non-*Pinctada maxima* oyster culture	Brian Jones Department of Fisheries Government of Western Australia	December 2002	September 2003
2003/669	Aquatic Animal Health Subprogram: conduct of a multi-jurisdictional simulation exercise focused on health management of Australian aquaculture	Iain East Australian Government Department of Agriculture, Fisheries and Forestry	August 2003	March 2004
2003/670	Aquatic Animal Health Subprogram: emergency response microalgal identification for the finfish aquaculture industry	Judith-Anne Marshall University of Tasmania, School of Plant Science	September 2003	May 2004
2003/671	Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of WA department of fisheries and industry bodies associated with freshwater crayfish culture	Fran Stephens Department of Fisheries Government of WA	October 2003	August 2004
Federal Budget Initiative: Joint Government and Industry				
2000/600	Aquatic Animal Health Subprogram: AQUAPLAN Resources and Funding Consultancy	Econ Search Pty Ltd	November 2000	January 2002

Project Number	Project Title	Principal Investigator	Project Start Date	Project End Date
2002/600	Aquatic Animal Health Subprogram: facilitating the establishment of the Aquatic Animal Health Consultative Committee (AAHCC) as the primary industry-government interface for aquatic animal health	Eva-Maria Bernoth Australian Government Department of Agriculture, Fisheries and Forestry	May 2002	July 2004
2003/600	Aquatic Animal Health Subprogram: development of strategies for improved stock loss insurance and for development of a cost-sharing arrangement for emergency disease management in aquaculture	Iain East Australian Government Department of Agriculture, Fisheries and Forestry	February 2003	February 2004

APPENDIX 7: AQUATIC ANIMAL HEALTH SUBPROGRAM: CHAIRMEN'S REPORT

By Simon Bennison (National Aquaculture Council) and Russ Neal (Australian Seafood Industry Council)

PROCESS

It is unlikely that the members of the steering committee and the scientific advisory committee realised how much of a workload they were taking on when they accepted the invitation to be part of this process. To be closely involved in setting priorities, reviewing milestone and final reports, participate in strategic planning exercises and in general provide technical expertise to the national aquatic animal health initiatives has been a very time consuming and demanding process. All stakeholders and in particular the commercial fishing and aquaculture industries are grateful for their professionalism and commitment in participating in the Subprogram initiative.

There still remains a considerable contribution to be made towards the prioritisation of projects submitted to the Fisheries Research and Development Corporation (FRDC) on an annual basis. This is reflected in the most recent call for applications where a total of 14 specific aquatic animal health proposals were submitted. This has been a reflection of the AAH Subprogram capacity to confront and resolve key aquatic animal health issues. Border security remains a critical aspect of the nation's aquatic animal health agenda, and there is a continuing need for this to be resourced if adequate measures are to be provided.

Australia's capacity in aquatic animal health has been seriously enhanced particularly in the fields of diagnostics, disease emergency response preparedness, training and effective and responsive databases.

The ability of the committee to draw on very high level scientific expertise has been one of the crucial factors in the success of the project.

LEVERAGE

The leverage from the $3m invested in the 40 projects has been in the order of $4.5m, which is a tremendous result and one which typifies the advantage and benefit of allowing an organization such as the Fisheries Research and Development Corporation to assist in managing the funds. The committees have been extremely resourceful in ensuring that the greatest leverage is achieved by applicants through other contributors across a wide range of stakeholders.

COMMUNICATION AND EXTENSION

There is an on-going commitment to ensure that the outcomes from the various projects are extended at the Aquaculture Conference in Sydney in September 2004. This will also be an opportunity to showcase many of the products such as videos, CDs and manuscripts.

14 May 2004

APPENDIX 8: AQUATIC ANIMAL HEALTH SUBPROGRAM: SCIENTIFIC REPORT

INTRODUCTION

The Aquatic Animal Health (AAH) Subprogram was established by FRDC in mid-2001 to provide a cohesive and national approach to aquatic animal health research and development in Australia, and in particular to address AQUAPLAN Program 6: Research and Development. The Subprogram has a national focus, consistent with international obligations.

During its current existence, the AAH Subprogram has managed a total of fifty projects, the majority of which have been/are supported through the Federal Government's Budget Initiative *Building a National Approach to Animal and Plant Health.* All projects have been developed following a dedicated stakeholder consultation process, assessment of the project's scientific merit, their feasibility and cost/benefit ratio. Projects funded through the Federal Budget Initiative constituted three programs:

- Diagnostics Program
- Manuals and Planning Program
- Training Program

DIAGNOSTICS PROGRAM

Projects within the diagnostics program have focussed on the National List of Reportable Diseases with research towards the development of improved diagnostic tests and ANZSDPs for the following diseases/agents:

- Aquatic birnaviruses/infectious pancreatic necrosis
- Crayfish plague/*Aphanomyces astaci*
- *Piscirickettsia salmonis*
- Spawner-isolated mortality virus
- Nervous necrosis virus
- Vibriosis
- Marteiliosis
- Red sea bream iridovirus
- Bonamiosis

In addition, a project on the development of reagents to support Australia's OIE Reference Laboratory for epizootic haematopoietic necrosis was funded.

MANUALS AND PLANNING PROGRAM

The manuals and planning program focussed on developing tools for emergency disease preparedness, and several disease strategy manuals have been/are in the process of being finalised:

- Viral haemorrhagic septicaemia disease strategy manual
- Crayfish plague disease strategy manual
- Viral encephalopathy and retinopathy disease strategy manual
- White spot disease disease strategy manual
- Whirling disease disease strategy manual

In addition to disease strategy manuals, a number of training manuals, other training tools and emergency disease management tools have been produced:

- Exotic disease training manual
- Aquatic animal disease emergencies – video and training kit
- Victoria State control centre management manual
- Aquatic disease disinfection manual
- Development of a training course on exotic diseases of aquatic animals
- Design and organisation of a multi-state disease emergency simulation exercise
- Subprogram Conference on "Emergency Disease Planning and Management"
- Queensland State control centre manual for managing aquatic disease emergencies
- Revision and expansion of the Australian aquatic animal disease identification field guide (CD-ROM)
- NSW State control centres manual
- Australian aquatic animal diseases and pathogens database
- Database for Australian diagnostic laboratory expertise for diseases of aquatic organisms
- Further development of the Tasmanian State control centre manual
- Emergency preparedness and response to mass mortality of yellowtail kingfish: development of plans and protocols
- Update of the AQUAVETPLAN enterprise manual (semi-open systems)

TRAINING PROGRAM

Rather than developing training tools, the training program was involved with the actual delivery of training and included a number of projects concerned with simulation exercises. In addition, training courses were delivered to targeted groups to enhance their skills and capability in specific areas of aquatic animal disease management:

- Enhancement of emergency disease management through the education and training of the CCEAD participants on the CCEAD process
- Enhancing the emergency disease response capability of NSW and QLD Government agencies and industry bodies associated with oyster culture
- Aquatic animal health emergency management training and incident simulation
- Enhancement of the emergency disease management capability in Victoria – adapting the AQUVETPLAN control centre management manual
- Training course on exotic diseases of aquatic animals

- Enhancing the emergency disease response capability of WA Department of Fisheries and industry bodies associated with non-*Pinctada maxima* oyster culture
- Conduct of a multi-jurisdictional simulation exercise focussed on health management in Australian aquaculture
- Emergency response by broad microalgal identification for the finfish aquaculture industry
- Enhancing the emergency disease response capability of WA Department of Fisheries and industry bodies associated with freshwater crayfish culture

OTHER PROJECTS

Other projects managed by AAH Subprogram that did not contribute to the three specified programs within FBI and included non-FBI funded aquatic animal health projects were:

- Development of strategies for improved stock loss insurance and for development of a cost-sharing arrangement for emergency disease management in aquaculture
- Generation of diagnostic reagents for pilchard herpesvirus
- Development of a disease zoning policy for Marteiliosis to support sustainable production, health certification and trade in Sydney rock oyster
- Production of nodavirus-free fish fry and the nodaviruses' natural distribution
- Pilchard herpesvirus infection in wild pilchards
- Detection and management of kingfish health issues in the yellowtail kingfish industry – the foundation for a health program for Australian finfish aquaculture

PROVISION OF SCIENTIFIC ADVICE

In addition to being responsible for technical aspects of the development and management of FBI/FRDC-funded research projects, the Scientific Advisory Committee (SAC) was responsible for providing expert scientific advice to the Subprogram Steering Committee on various issues. In order to ensure that advice was appropriate, SAC consulted with other aquatic animal health specialists, as needed. Thus NAAH-TWG has been consulted during the development of, and the annual reviews of, the Strategic Plan. Moreover, SAC has conducted scientific workshops on very specific and specialised topics, inviting Australian experts to contribute to the discussion leading to provision of advice to the Subprogram Steering Committee. For example, the significance of *Pfiesteria* with respect to aquatic animal health and to aquatic animal health specialists required to investigate *Pfiesteria* blooms was the subject of one of these workshops. A balanced report from the workshop was produced and the Subprogram Steering Committee was able to make appropriate national decisions concerning research projects for *Pfiesteria*.

Similarly, with advice from SAC, the Subprogram initiated, developed, and funded a novel project to develop an aquatic animal health training kit, including a training video, targeted at workers and specialists within the aquaculture industry sector. Moreover, SAC planned and organised the first national scientific conference held specifically for aquatic animal health specialists in Australia. The conference provided a forum where over 40 aquatic animal health specialists involved in finfish, crustacean and molluscan health convened to discuss current and future aquatic animal health research in Australia.

CONCLUSIONS

Stakeholder comments show that a key strength of the AAH Subprogram has been its strategic focus and the establishment of a network of aquatic animal health experts and research providers. The scientific output directed at aquatic animal health, from the fifty Subprogram projects over the Subprogram's existence, is unprecedented in Australia. Coordination of the R&D program by a steering committee comprising of industry and government representatives and guided by good scientific advice has advanced significantly Australia's capability in the management of aquatic animal disease outbreaks. Further, the AAH Subprogram has provided an industry-based structure through which to develop and maintain strategic direction for investment in aquatic animal health R&D.

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2 June 2004