Development of Generic Contingency Plans for Disease Emergencies of Aquatic Animals

Final Report

Mark S. Crane[1] and Grant T. Rawlin[2]

[1]Australian Animal Health Laboratory CSIRO Animal Health
Private Bag 24, Geelong VIC 3220

[2]Animal Health Science and Emergency Management Branch
National Offices of Animal and Plant Health
Agriculture, Fisheries and Forestry, Australia
GPO Box 858, Barton ACT 2601

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PROJECT INVESTIGATORS

PROJECT TITLE

Development of Generic Contingency Plans for Disease Emergencies of Aquatic Animals

PROJECT NUMBER

97/214

RESEARCH ORGANISATION

Name: CSIRO Australian Animal Health Laboratory

CO-PRINCIPAL INVESTIGATOR

Name: Mark Crane

Position: Project Leader
AAHL Fish Diseases Laboratory

Postal Address: CSIRO Animal Health
Private Bag 24
Geelong, VIC 3220

Phone: (03) 52 27 5000
Facsimile: (03) 52 27 5555

CO-PRINCIPAL INVESTIGATOR

Name: Grant Rawlin

Position: Principal Veterinary Officer
Animal Health Science and Emergency Management Branch

Postal Address: National Offices of Animal and Plant Health, AFFA
GPO Box 858
Barton, ACT 2601

Phone: (02) 6272 4545
Facsimile: (02) 6272 4533

ACRONYMS

Acronym	Full Spelling
AAF	Australian Aquaculture Forum
AAHL	Australian Animal Health Laboratory
ADVS	Aquaculture Development and Veterinary Services Pty Ltd
AFFA	Agriculture, Forestry and Fisheries - Australia
APFA	Australian Prawn Farmers Association
AQIS	Australian Quarantine and Inspection Service
AQUAVETPLAN	Aquatic Animal Veterinary Emergency Plan
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASIC	Australian Seafood Industry Council
AUSVETPLAN	Australian Animal Veterinary Emergency Plan
BRS	Bureau of Resource Sciences
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	Chief Veterinary Officer
DNRE	Department of Natural Resources and Environment
DPIE	Department of Primary Industries and Energy
DPIF	Department of Primary Industries and Fisheries
DPIWE	Department of Primary Industries, Water and Environment
FAB	Fisheries and Aquaculture Branch
FHCG	Fish Health Coordinating Group
FHMC	Fish Health Management Committee
FRDC	Fisheries Research and Development Corporation
MCFFA	Ministerial Council for Forestry, Fisheries and Aquaculture
NACA	Network of Aquaculture Centres in Asia-Pacific
NOAPH	National Office of Animal and Plant Health
OCVO	Office of the Australian Chief Veterinary Officer
OIE	Office International des Epizooties (World Organisation for Animal Health)
QDPI	Queensland Department of Primary Industries
SCARM	Standing Committee on Agriculture and Resource Management
SCFA	Standing Committee on Fisheries and Aquaculture
SDT	Standard Diagnostic Technique

ACKNOWLEDGEMENTS

While funding was provided by the *Fisheries Research and Development Corporation* for travel and accommodation to enable the gathering of the wide expertise required to produce this document significant support was also received from the Fisheries Resources Research Fund and CSIRO Animal Health. The contributions of industry and government groups who donated time and salaries are gratefully acknowledged and are an indication of the commitment of these groups to the process. Members of the Fish Health Coordinating Group gave encouragement and support to the project.

1.0 NON-TECHNICAL SUMMARY

97/214 Development of generic contingency plans for disease emergencies of aquatic animals

CO-PRINCIPAL INVESTIGATORS

Dr. Mark Crane
AAHL Fish Diseases Laboratory
CSIRO Animal Health
Private Bag 24
Geelong, VIC 3220

Telephone: 03 52 27 5000

Dr. Grant Rawlin
National Office of Animal and Plant Health
AFFA
GPO 858
Barton ACT 2601

Telephone: 02 6272 4545

OBJECTIVES

1. Write four generic (enclosed water; open freshwater; net/open culture marine; open marine) contingency planning manuals for the occurrence of significant diseases in aquatic animals to draft form.

2. Following consultation with industry, State government and Commonwealth government representatives, produce four final generic contingency planning manuals.

SUMMARY

This project was initiated by the Fish Health Coordinating Group (FHCG) of SCARM/SCFA. To accomplish project objectives, the project leaders brought together experts from industry, State Government and Commonwealth Agencies to scope the task, plan and organise the structure of the contingency planning manuals, and to form writing groups for each of the manuals.

Objective 1. During the course of the project, there was strong support for the four manuals to be combined in a single manual. Thus the Enterprise Manual of AQUAVETPLAN consists of four generic contingency plans under the headings:

1. Open Systems
2. Semi-open Systems
3. Semi-closed Systems
4. Closed Systems

The Enterprise Manual covers all major activities/enterprises involving aquatic animals in all environments whether marine or freshwater and whether the animals form the basis of the wild catch or whether they are farmed stock.

The manual is divided into three main sections. Section A is titled *Overview* and includes definitions, key operational terms and a brief discussion on management of disease emergencies. Section B is titled *Industry Sector Information* and Section C is titled *Response Options* both of which are self-explanatory. In addition, at the rear of the manual there is a series of appendices which contain additional information to assist in management of an aquatic animal disease emergency. The following appendices have been included.

Appendix 1. Summary of current legislation with relevance to aquatic animal diseases

Appendix 2. Human pathogens
Appendix 3. Species of animals used for aquaculture in Australia
Appendix 4. Australian National List of Reportable Diseases of Aquatic Animals
Appendix 5. Aquatic animal disease emergency contact numbers in Australia
Appendix 6. Drug and chemical use in aquaculture

The industry sectors covered by the manual are:

1. Catchment, estuarine and marine commercial and recreational wild-catch fisheries (open systems);

2. The semi-open systems used in southern bluefin tuna, salmonid and barramundi cage culture, pearl oyster and edible shellfish culture;

3. The semi-closed systems used in culture of native freshwater finfish, prawns (hatcheries and ponds), trout (grow-out in freshwater), salmonids (hatcheries and raceways), marine finfish (hatcheries) and freshwater crayfish;

4. The closed systems used for ornamental aquatic animals, for maintaining live fish for human consumption and those used in intensive grow-out facilities and hatcheries.

Objective 2. During the course of this project representatives from the farmed salmonid, farmed oyster, farmed tuna and farmed prawn industry sectors and from the ornamental fish industry have been consulted and/or have been members of the writing groups. Similarly, officers of State/Territory Departments and of Commonwealth Agencies have been consulted and/or have been members of the writing groups.

The Generic Contingency Plans for Disease Emergencies of Aquatic Animals, developed during the course of this project, which are now known collectively as the Enterprise Manual of AQUAVETPLAN and modeled on AUSVETPLAN enterprise manuals, will be incorporated into Program 4 of AQUAPLAN, a national five-year plan for aquatic animal health in Australia, implemented by the Department of Agriculture, Forestry and Fisheries, Canberra.

ISBN number 0 642 73000 8 has been assigned to the Enterprise Manual.

The final document has been be forwarded to Fish Health Management Committee (FHMC), Standing Committee on Fisheries and Aquaculture (SCFA) and Ministerial Council of Forestry, Fisheries and Aquaculture (MCFFA) for endorsement. As soon as endorsement is obtained the first version of the Enterprise Manual will produced and distributed. As part of this project, printed copies will be distributed to key stakeholders.

It is expected that AQUAVETPLAN including the Enterprise Manual will be placed on the AFFA web-site for efficient dissemination. In addition, it is likely that AQUAVETPLAN will need to be up-dated on a regular basis. Such activities will be managed by AFFA. Linkages to other useful web-sites relevant to aquatic animal diseases will be included.

Other related activities which come under the umbrella of AQUAPLAN include the development of Standard Diagnostic Techniques (SDTs) for aquatic animal diseases. It is expected that these SDTs will be available as hard-copies as well as placed onto the AFFA web-site and linked to other documents such as AQUAVETPLAN.

2.0 BACKGROUND

In recent years, several important outbreaks of aquatic animal disease have occurred in Australia such as the 1995 [5, 9] and 1998/99 pilchard mortality events and various prawn diseases in Queensland [7], each with a significant negative impact not only on the specific industry but also other related industries. Moreover, world-wide there is an increasing focus on diseases of aquatic organisms and their influence on production, catches, trade and public health. Recently, there have been significant developments within OIE and NACA organisations with respect to aquatic animal diseases. Thus it is important for Australia to further develop the capacity to respond to emergency disease outbreaks in the aquatic environment.

It was during this period that the Fish Health Coordinating Group (FHCG), operating under SCARM and SCFA, was formed to formally coordinate aquatic animal disease issues across two ministerial Councils. FHCG, chaired by Prof. Mike Rickard (Chief, CSIRO Animal Health, member of Animal Health Committee), comprised of members from SCFA Aquaculture Committee, the Office of the Commonwealth CVO and the fisheries industries (see Appendix 1). While policy for prevention and control of disease is well-developed in the terrestrial animal industries, similar policies and expertise either do not exist or are currently being developed for the aquatic animal industries. The status of underdevelopment in this area was recognised by the SCARM Task Force on Managing Incursions [8]. The Fish Sub-committee of the Task Force was formed around the basic membership of FHCG and organised two joint industry/government workshops to seek views and make recommendations with respect to the adoption of national reporting and response mechanisms to manage incursions of aquatic animal diseases and pests.

One of the main outcomes of the workshop, held in 1996, was the recognition for the need for a series of area-specific contingency plans:

1) Enclosed waters
2) Open freshwater
3) Net/open culture marine
4) Open marine

FHCG is recognised as a technical group that has progressed issues which will contribute to the development of a national aquatic animal health system as recommended by the report of the Task Force on Imported Fish and Fish Products [4]. Such activities have included:

- A review of State and Territory aquatic animal disease legislation, partly funded by FRDC (FRDC Project Number 95/087) [1]
- Development of a National List of Reportable Diseases of Aquatic Animals (Appendix 2).

Recently, in addition to progressing the current project, viz. contingency planning and arrangements for the management of emergency aquatic animal disease outbreaks, partly funded by FRDC, FHCG initiated progress on development of standard diagnostic techniques for diseases of aquatic animals. During the development phases of these projects other issues, such as compensation (for industry as a result of stock destruction in an effort to control disease spread) were raised and which needed to be addressed but at a higher level than FHCG. Thus the Fish Health Management Committee (FHMC; Appendix 3) was established to ensure that progress on such higher level issues occurred while FHCG continued to progress technical issues.

In response to the Report of the National Task Force on Imported Fish and Fish Products [4] and the Nairn Report on quarantine [6], FHMC convened a Strategic Planning Workshop of Government and industry representatives to develop a national five-year plan for aquatic

animal health, 28-29 April 1998, Canberra [2]. Participants included representatives of SCARM, SCFA and major aquaculture industry leaders and peak industry bodies.

The outcome of the meeting was an agreed national five-year plan for aquatic animal health in Australia (AQUAPLAN) consisting of eight programs. These programs will be overseen by one or more members of the Fish Health Management Committee. The Quarantine program will be overseen by the Australian Quarantine and Inspection Service (AQIS) which has statutory authority in this area.

The programs and overseers are:

1. International linkages (Gardner Murray, Chief Veterinary Officer; Angus Horwood, RecFish Australia);
2. Quarantine (Paul Hickey, AQIS);
3. Surveillance, Monitoring and Reporting (Gardner Murray; Angus Horwood);
4. Preparedness and Response (John Pollock, SCARM; Angus Horwood);
5. Awareness (Mike Rickard, CSIRO Australian Animal Health Laboratory);
6. Research and development (Rick Scoones, Australian Aquaculture Forum);
7. Legislation, policies and jurisdiction (Alex Schaap, SCFA); and
8. Resources and funding (Brian Jeffries, Australian Seafood Industry Council).

The Generic Contingency Plans for Disease Emergencies of Aquatic Animals, developed during the course of this project, which are now known as the Enterprise Manual of AQUAVETPLAN and modeled on AUSVETPLAN enterprise manuals, will be incorporated into Program 4 of AQUAPLAN.

3.0 NEED

Development of contingency plans for significant animal diseases is a critical first step in the management of disease outbreaks. In this respect, aquatic animal health policy development is lagging behind terrestrial animal health policy by approximately 20 years. At the SCARM Task Force on Managing Incursions - Fish Sub-committee – workshops, all sectors of the fishing industry strongly supported the need for a national approach to aquatic animal disease control issues and identified the writing of contingency plans for disease incursions to be an important task.

In response to the Report of The National Task Force on Imported Fish and Fish Products [4] and the Nairn Report on quarantine [6], government funding has been made available to support the development of a national five-year plan for aquatic animal health in Australia (AQUAPLAN) [2]. The Enterprise Manual of AQUAVETPLAN, developed during the course of this project, will be a fundamental part of AQUAPLAN.

4.0 OBJECTIVES

The project objectives in the original application were:

1. Write four generic (enclosed water; open freshwater; net/open culture marine; open marine) contingency planning manuals for the occurrence of significant diseases in aquatic animals to draft form.

2. Following consultation with industry, State government and Commonwealth government representatives, produce four final generic contingency planning manuals.

During the course of the project, there was strong support for the four manuals to be combined in a single manual. Thus the generic contingency planning manual (the Enterprise Manual of AQUAVETPLAN) consists of four generic contingency plans under the headings:

1. Open Systems
2. Semi-open Systems
3. Semi-closed Systems
4. Closed Systems

The Enterprise Manual covers all major activities/enterprises involving aquatic animals in all environments whether marine or freshwater and whether the animals form the basis of the wild catch or whether they are farmed stock.

5.0 METHODS

Two meetings of writing groups were organised to draft the contingency plans. The meetings were convened at locations which facilitated travel to/from all States and Territories. The first meeting was held in Brisbane on 4-6 August 1997 and the second meeting was held at CSIRO Animal Health, Geelong on 12-14 October 1997. CSIRO Animal Health, Geelong was used as the venue for the second meeting to allow writing groups access to sufficient word-processing resources and library facilities.

5.1 Brisbane Meeting Tasks

- Convene industry, State Government and Commonwealth Agency experts to scope the task, plan and organise a basic and consistent structure to the contingency planning manuals.

- Basic requirements for contingency planning manuals, based on those developed for terrestrial animal diseases (e.g. AUSVETPLAN), were discussed.

- Project participants were assigned to each of four writing groups to draft an outline of their assigned manual and present to the whole forum for comment. Each writing group consisted of, at least:

1. ***Group secretary*** (a Commonwealth Government representative responsible for compiling the draft plans)
2. ***Aquatic animal disease professional***
3. ***Systems expert***
4. Relevant ***industry representative***

- Writing-group members were assigned specific sections of the outline to draft.

5.2 Geelong Meeting Tasks

- Each writing group presented to the forum the first draft of the contingency planning manual specific to their assigned system. Comments were gathered from all project participants.

- Using resources (computers and library) available at AAHL, writing groups initiated writing of a “second draft” incorporating agreed revisions.

- On the final day, progress on the second draft was reported to the participants. Comments were gathered from the participants.

- Plans to finalise the draft manuals were discussed. Gaps were identified.

- Distribution lists for “final drafts” of the planning manuals were developed.

5.3 Final Document Preparation

Following the second meeting, the co-principal investigators edited the information gathered from each writing group by each group leader and ensured that it conformed to the standard, agreed format. Identified gaps were filled and the draft Enterprise Manual was forwarded first to the relevant writing group and the comments amalgamated. The complete document was

then forwarded to all members of every writing group for comment. All comments received have been considered by the co-principal investigators in preparation of the final draft.

The final draft was forwarded to a professional proof reader/technical editor for production of the final document. Niall Byrne (Science Communication Consultant) of Byrne Young Communication, and associates, were selected to undertake this task. Niall has had extensive experience as a science communicator and, during his tenure at CSIRO, was involved in projects associated with AUSVETPLAN and is well-qualified to undertake final editing of the Enterprise Manual.

6.0 DETAILED RESULTS

6.1 Brisbane Meeting Outcomes

It was agreed that it is appropriate to have 4 plans covering the following systems:

1. Open systems (where there is little, or no, control over movements of animals and water flow e.g. oceans, estuaries and catchments)

2. Semi-open systems (where there is little, or no, control over water flow but at least some control of animals e.g. net-pen culture in oceans, rivers, lakes)

3. Semi-closed systems (where there is at least some control over both water flow and animals e.g. pond culture)

4. Closed systems (where there is the potential for total control over water flow and animals e.g. recirculation aquaria)

It was further agreed that the plans should be contained within a single manual *(*similar to an *Enterprise Manual* of AUSVETPLAN) and this manual should be *loose-leaf* style so that up-dating would be facilitated.

Four writing groups covering these systems were formed as follows:

Open Waters

Glenn Hurry	FAB, AFFA, Canberra
Brian Jones	Department of Fisheries, Western Australia
Judith Handlinger	Department of Primary Industries, Water & Environment (DPIWE), Tasmania
Roger Clarke	Oyster Farmer's Association, New South Wales

Semi-Open Waters

Mark Crane	CSIRO Australian Animal Health Laboratory, Geelong, Victoria
Paul Hardy-Smith	DPIWE, Tasmania
Steve Percival	Aquaculture Development and Veterinary Services, Tasmania
Ruth Reuter	Veterinary Pathology Services, Adelaide, South Australia
Kirsten Rough	Tuna Boat Owners Association, South Australia

Semi-Closed Waters

Judith Bourne	AQIS, AFFA, Canberra
Liz Evans	Australian Prawn Farmers Association, Queensland
Wendy Townsend	QDPI, Brisbane, Queensland
Dick Callinan	New South Wales Fisheries, Wollongbar, NSW
Pheroze Jungalwalla	Tassal Pty Ltd, Hobart, Tasmania
Eva-Maria Bernoth	NOAPH, AFFA, Canberra
Stuart Rowland	New South Wales Fisheries, Grafton, NSW

Closed Waters

Grant Rawlin	NOAPH, AFFA, Canberra
Ramesh Perera	AQIS, AFFA, Canberra
Peter Thornber	NOAPH, AFFA, Canberra
Murray Barton	DPIF, Darwin, Northern Territory
Jared Patrick	Bay Tropical Fish Farm, Pty Ltd, Brisbane, Queensland

In addition, the following persons were co-opted as emergency animal disease management advisors:

Chris Bunn	NOAPH, AFFA, Canberra
Dick Rubira	DNRE, Victoria

Furthermore, it was recommended that experts on certain industry sectors should be contacted to supply specific information required for the plans:

Rick Fallu, DPIF, Northern Territory (freshwater crayfish)
Piers Hart, DPIWE, Tasmania (deep water shellfish)
Harry King, Saltas Pty Ltd, Tasmania (Atlantic salmon hatcheries)
Edward Meggit, Australian Trout and Salmon Farmers Association, Vic. (farmed rainbow trout)
Derek Cropp, DPIWE, Tasmania (oyster Hatcheries)
Chris Barlow, QDPI, Brisbane (farmed barramundi)
Jill Millan, DPIF, Northern Territory (farmed crocodiles)
Alistair Herfort, NOAPH, AFFA, Canberra (human pathogens associated with seafood)

The format of the manual was agreed upon. There are three main sections (A, B and C) organised as follows:

Section A
Overview

Section Contents

The following is an example of how sub-sections in Section B is organised, for each system and industry sector:

Section B
Industry Sector Information

Section Contents

The industry sectors covered by the manual (section B) are:

OPEN SYSTEMS
- Wild-catch Fisheries (catchment, estuarine and marine; commercial and recreational)

SEMI-OPEN SYSTEMS
- Southern Bluefin Tuna cage culture
- Salmonid cage culture
- Barramundi cage culture
- Pearl oyster culture
- Edible shellfish culture (oysters, mussels, scallops)

SEMI-CLOSED SYSTEMS
- Native freshwater finfish
- Prawns for grow-out
- Prawn hatcheries
- Trout in freshwater
- Salmonid hatcheries and raceways
- Marine finfish hatcheries
- Freshwater crayfish

CLOSED SYSTEMS
- Ornamental aquatic animals

Section C contains 5 major sub-sections (General Principles, Response options: Open systems, Response options: Semi-open Systems, Response options: Semi-closed systems and Response options: Closed systems) each organised in the following way (General Considerations is used as an example):

Section C
Response Options

Section Contents

At the rear of the manual there is a series of appendices which contain additional information to assist in management of an aquatic animal disease emergency. The following appendices have been included.

At the conclusion of the first meeting, plans for out-of-session work and for the second meeting were agreed to.

6.2 Geelong Meeting Outcomes

The agreed format from the first meeting was revisited to ensure that it remained appropriate following gathering of additional information.

Information gathered at the first meeting, during the interim period between the two meetings and at the second meeting was collated and formatted according to the agreed/revised outline.

Any gaps in information were identified and methods to fill these gaps established and implemented.

6.3 Final Document Preparation

Using all available information gathered at the two meetings and out-of-session, a complete draft document was prepared by the co-principal investigators and distributed to selected stakeholders for comment. Comments were incorporated into a final draft. The final draft was forwarded to, and proof read/edited by, a science communication consultant for final document preparation. The final format will allow use as a hard-copy (ring-binder/loose leaf format) as well as conversion to Acrobat format to facilitate placement on the AFFA web-site.

ISBN number 0 642 73000 8 has been assigned to the Enterprise Manual of AQUAVETPLAN.

The final document will be forwarded to FHCG, FHMC, SCFA and MCFFA for endorsement and SCARM and ARMCANZ for information.

7.0 BENEFITS

Aquaculture and fishing industries throughout Australia will be the primary beneficiaries. Effective communication and contingency planning are essential to the management of emergency diseases which have the potential to damage the Australian fisheries industries both directly (through loss of stock; increased work-load) and by loss of trade, as has been demonstrated in terrestrial animal industries in many countries (e.g. mad cow disease in U.K.). Thus the benefits and beneficiaries are the same as those stated in the original application.

The Enterprise Manual of AQUAVETPLAN is directed towards all stakeholders likely to be involved in management of an aquatic animal disease emergency. Thus Commonwealth Government Officers as well as State Departments of Fisheries and Agriculture will benefit from the information covered by the Enterprise Manual. All aquaculture and fisheries industries will benefit from the development of the Enterprise Manual. The benefits will only be realised during its implementation as part of the management of an aquatic animal disease emergency. Thus quantification of the benefits is difficult since each aquatic animal disease emergency will present differently.

Indirect benefits include increased confidence of our trading partners in Australian fisheries products. Documented aquatic animal disease contingency plans demonstrate Australia's commitment to responsible management of disease emergencies and should reduce the negative impact of disease on Australian industries and international trade.

In addition, the Enterprise Manual documents the responsibilities of aquaculture and fisheries industries in management of disease emergencies. Industry sectors, individual operations and State authorities should develop their own disease contingency plans which would dove-tail with the Enterprise Manual and thus facilitate effective and efficient management of aquatic animal disease emergencies should any arise.

8.0 INTELLECTUAL PROPERTY

No typical intellectual property (commercially significant developments, patents applied for or granted, licences, etc.) has been generated by this project.

9.0 FURTHER DEVELOPMENT

It is expected that the Enterprise Manual of AQUAVETPLAN, as part of AQUAPLAN, will be placed on the AFFA web-site for efficient dissemination. In addition, it is likely that AQUAVETPLAN will need to be up-dated on a regular basis. Such activities will be managed by AFFA. Linkages to other useful web-sites will be made.

Other related activities which come under the umbrella of AQUAPLAN include the development of Standard Diagnostic Techniques (SDTs) for aquatic animal diseases [3]. It is expected that these SDTs will be available as hard-copies as well as placed onto the AFFA web-site and linked to other documents such as the various manuals of AQUAVETPLAN.

10.0 STAFF

Apart from the co-principal investigators, officers from State and Commonwealth agencies and representatives from various aquaculture and fisheries industries have been involved in this project and are listed below.

Co-principal Investigators

Mark Crane, AAHL Fish Diseases Laboratory, CSIRO Animal Health, Geelong, Victoria
Grant Rawlin, National Offices of Animal and Plant Health, Agriculture Forestry and Fisheries Australia, Canberra

Members of Writing Groups

Open Waters

Glenn Hurry, Fisheries and Aquaculture Branch, AFFA, Canberra
Brian Jones, Department of Fisheries, Western Australia
Judith Handlinger, Department of Primary Industries, Water and Environment, Tasmania
Roger Clarke, Oyster Farmer's Association, New South Wales

Semi-Open Waters

Mark Crane, CSIRO AAHL, Geelong, Victoria
Paul Hardy-Smith, DPIWE, Tasmania
Steve Percival, ADVS, Tasmania
Ruth Reuter, Veterinary Pathology Services, South Australia
Kirsten Rough, Tuna Boat Owners Association, South Australia

Semi-Closed Waters

Judith Bourne, AQIS, AFFA, Canberra
Liz Evans, Australian Prawn Farmers Association, Queensland
Wendy Townsend, Queensland Department of Primary Industries, Brisbane, Queensland
Dick Callinan, New South Wales Fisheries, Wollongbar Agricultural Institute, NSW
Pheroze Jungalwalla, Tassal Pty Ltd, Tasmania
Eva-Maria Bernoth, National Office of Animal and Plant Health, AFFA, Canberra.
Stuart Rowland, New South Wales Fisheries, Grafton, NSW

Closed Waters

Grant Rawlin, NOAPH, AFFA, Canberra
Ramesh Perera, AQIS, AFFA, Canberra
Peter Thornber, NOAPH, AFFA, Canberra
Murray Barton, Department of Primary Industries and Fisheries, Northern Territory
Jared Patrick, Bay Tropical Fish Farm, Pty Ltd, Brisbane, Queensland

In addition, the following persons were co-opted as emergency animal disease management advisers:

Chris Bunn, NOAPH, AFFA, Canberra
Dick Rubira, Department of Natural Resources and Environment, Victoria

Furthermore, it was recommended that experts on certain industry sectors should be contacted to supply specific information required for the plans:

Rick Fallu, DPIF, Northern Territory (freshwater crayfish)
Piers Hart, DPIWE, Tasmania (Deep Water Shellfish)
Harry King, Saltas Pty Ltd, Tasmania (Atlantic salmon hatcheries)
Edward Meggit, Australian Trout and Salmon Farmers Association, Vic. (Farmed rainbow trout)
Derek Cropp, DPIF, Tasmania (Oyster Hatcheries)
Chris Barlow, QDPI, Brisbane (Farmed barramundi)
Jill Millan, DPIF, Northern Territory (Farmed crocodiles)
Alistair Herfort, NOAPH, AFFA, Canberra (Human pathogens associated with seafood)

11.0 DISTRIBUTION

Copies of the *Enterprise Manual* of AQUAVETPLAN will be distributed to the following organisations.

11.1 Fisheries Research and Development Corporation
(10 bound copies, 1 unbound copy plus a copy on a floppy disc)

Mr Alex Wells
Projects Manager
FRDC
PO Box 222
Deakin West ACT 2600

Additional copies to FRDC aquaculture sub-program leaders:

Dr Robert van Barneveld
Research Nutritionist
Barneveld Nutrition Pty Ltd
Lot 12, Wild Street
Williamstown SA 5351

Mr Steven Clarke
Aquaculture Program Leader
South Australian Research and Development Institute
Department of Aquatic Sciences
2 Hamra Ave
West Beach SA 5024

Dr Geoff Allan
Supervisor of Research (Aquaculture)
Port Stephens Research Centre
Taylors Beach Road
Taylors Beach NSW 2316

11.2 Fish Health Coordinating Group

Mr Simon Wilkinson
Secretary
Fish Health Coordinating Group
Office of Commonwealth CVO
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.3 Standing Committee on Fisheries and Aquaculture/Fish Health Management Committee (2 copies)

Mr Glenn Hurry
Fisheries and Aquaculture Branch
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.4 Animal Health Science and Emergency Management Branch, NOAPH, AFFA

Dr Mike Nunn
Animal Health Science and Emergency Management Branch
National Office of Animal and Plant Health
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.5 Office of the Commonwealth Chief Veterinary Officer, AFFA

Dr Peter Thornber
National Office of Animal and Plant Health
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.6 Aquatic Animal Health Unit, NOAPH, AFFA

Dr Eva-Maria Bernoth
Aquatic Animal Health Unit
National Office of Animal and Plant Health
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.7 Livestock and Pastoral Division, AFFA

Dr Chris Bunn
Livestock and Pastoral Division
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.8 Australian Quarantine and Inspection Service, AFFA

Dr Peter Beers
AQIS
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

Dr Judith Bourne
AQIS
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

Dr Ramesh Perera
AQIS
Agriculture, Forestry and Fisheries – Australia
GPO Box 858
Barton ACT 2601

11.9 CSIRO Marine Research

Dr Peter Rothlisberg
CSIRO Marine Research
P.O. Box 120
Cleveland QLD 4163

The Librarian
CSIRO Marine Research
P.O. Box 120
Cleveland QLD 4163

The Librarian
CSIRO Marine Research
GPO Box 1538
Hobart TAS 7001

11.10 CSIRO Tropical Agriculture

Dr Peter Walker
CSIRO Tropical Agriculture
Long Pocket Laboratory
CSIRO Tropical Agriculture
Private Bag 3
Indooroopilly QLD 4068

11.11 CSIRO Animal Health

Dr Mike Rickard
Chief
CSIRO Animal Health
Private Bag 24
Geelong VIC 3220

The Librarian
CSIRO Animal Health
Private Bag 24
Geelong VIC 3220

11.12 Australian Institute of Marine Science

Dr Russell Reichelt
Director
Australian Institute of Marine Science
Cape Ferguson
PMB No 3
Townsville Mail Centre QLD 4810

11.13 Australian Seafood Industry Council

Mr Nigel Scullion
Chairman
Australian Seafood Industry Council
PO Box 614
Darwin NT 0801

11.14 Tasmanian Salmonid Growers Association

Mr Tony Smithies
Executive Officer
Tasmanian Salmonid Growers Association
GPO Box 1614C
Hobart TAS 7001

Mr Pheroze Jungalwalla
Tassal Ltd
GPO Box 1645
Hobart TAS 7001

Mr Harry King
SALTAS
PO Box 1
Wayatinah TAS 7140

11.15 Oyster Growers Association of Australia

Mr Roger Clark
Oyster Growers Association of Australia
PO Box 254
Turramurra NSW 2074

11.16 Aquaculture CRC Ltd

Dr Peter Montague
Director
Aquaculture CRC Ltd
PO Box 123
Broadway
Sydney NSW 2007

11.17 Pet Industry Joint Advisory Council

Mr Rick Datodi
Pet Industry Joint Advisory Council
Aquarium Industries (Aust) Pty Ltd
68 Chiffley Drive
Preston VIC 3072

Mr Jared Patrick
Bay Tropical Fish Farm Pty Ltd
Junction Road
Burpengary QLD 4505

11.18 Australian Fisheries Management Authority

Mr Frank Meer
Managing Director
Australian Fisheries Management Authority
PO Box 7051
Canberra Mail Centre ACT 2610

11.19 Tuna Boat Owners' Association Inc.

Mr Brian Jeffries
President
Tuna Boat Owners' Association Inc.
PO Box 416
Eastwood SA 5063

Dr Kirsten Rough
Tuna Boat Owners' Association Inc.
PO Box 416
Eastwood SA 5063

11.20 RecFish Australia

Dr David Howes
RecFish Australia
6 Provis Place
Kambah ACT 2902

11.21 Department of Primary Industries Water & Environment, Tasmania

Dr Rod Andrewartha
Acting CVO
Department of Primary Industries, Water and Environment
Marine Board Building
PO Box 192B
Hobart TAS 7001

Dr Judith Handlinger
Department of Primary Industries, Water and Environment
Mount Pleasant Laboratories
PO Box 46
Kings Meadows TAS 7249

Mr Piers Hart
Marine Research Laboratory
Department of Primary Industries, Water and Environment
Crayfish Point
Taroona TAS 7006

Mr Derek Cropp
32A Brins Mead Road
Mount Nelson TAS 7007

11.22 Department of Primary Industries & Fisheries, Northern Territory

Dr Allen Bryce
Director of Animal Health
Department of Primary Industry and Fisheries
PO Box 990
Darwin NT 0801

Mr Rex Pyne
Department of Primary Industry and Fisheries
PO Box 990
Darwin NT 0801

Mr Murray Barton
Department of Primary Industry and Fisheries
PO Box 990
Darwin NT 0801

Mr Rick Fallu
Department of Primary Industry and Fisheries
PO Box 990
Darwin NT 0801

Dr Jill Millan
Department of Primary Industry and Fisheries
PO Box 990
Darwin NT 0801

11.23 Department of Primary Industries and Resources (Fisheries), South Australia

Dr Robin Vandegraaff
CVO
Department of Primary Industries
GPO Box 1671
Adelaide SA 5001

Dr Gary Morgan
Director of Fisheries
PIRSA (Fisheries)
GPO Box 1625
Adelaide SA 5001

11.24 Department of Fisheries, NSW

Director of Fisheries
Department of Fisheries
Sydney Fish Markets
Locked Bag 9
Pyrmont NSW 2009

Dr Dick Callinan
Wollongbar Agricultural Institute,
Regional Veterinary Laboratory,
Bruxner Highway NSW 2477

Mr Stuart Rowland
Eastern FW Fisheries Research Centre
NSW Fisheries
Grafton NSW 2460

Department of Agriculture, New South Wales

Dr Dick Jane
CVO
NSW Agriculture
Locked Bag 21
Orange NSW 2800

11.26 Department of Fisheries, Western Australia

Dr Brian Jones
Department of Fisheries
Animal Health Laboratories
Baron Hay Court
South Perth WA 6151

11.27 Department of Agriculture, Western Australia

Dr John Edwards
CVO
Division of Animal Industries
Agriculture Western Australia
Locked Bag No. 4
Bentley Delivery Centre
WA 6983

11.28 Department of Primary Industries, Queensland

Dr Kevin Dunn
Executive Director
Animal and Plant Health Service
Department of Primary Industries
GPO Box 46
Brisbane QLD 4001

Mr Jim Gillespie
Manager
Aquaculture
Department of Primary Industries
GPO Box 46
Brisbane QLD 4001

Dr Wendy Townsend
Department of Primary Industries
GPO Box 46
Brisbane QLD 4001

Mr Ian Anderson
Oonoonba Veterinary Laboratory
QDPI
PO Box 1085
Townsville, QLD 4810

Dr Chris Barlow
Department of Primary Industries
Freshwater Fisheries & Aquaculture Centre
Kennedy Highway
PO Walkamin QLD 4872

11.29 Department of Natural Resources and Environment, Victoria

Dr Andrew Turner
CVO
Department of Natural Resources and Environment
467-485 Mickleham Road
Attwood VIC 3049

Dr Ross Winstanley
Director
Fisheries and Aquaculture
Department of Natural Resources and Environment
240-250 Victoria Parade
East Melbourne VIC 3002

11.30 Department of Parks and Conservation, Australian Capital Territory

Dr Will Andrew
CVO
ACT Parks and Conservation Service
Box 1119
Tuggeranong ACT 2901

11.31 National Fishing Industry Council

Executive Officer
National Fishing Industry Council
Unit 1
6 Phipps Place
Deakin ACT 2600

11.32 National Fishing Industry Training Council

Executive Officer
National Fishing Industry Training Council
GPO Box 2851AA
Melbourne VIC 3001

11.33 Aquaculture Development and Veterinary Services

Dr Steve Percival
Aquaculture Development and Veterinary Services P/L
329 Allen Rivulet Road
Allens Rivulet TAS 7150

11.34 Veterinary Pathology Services, Adelaide, South Australia

Dr Ruth Reuter
Veterinary Pathology Services
33 Flemington Street
Glenside SA 5065

11.35 Australian Prawn Farmers Association

Mr Martin Breen
Executive Officer, APFA
PO Box 3128
South Brisbane QLD 4101

11.36 Australian Trout and Salmon Farmers Association

Mr Edward Meggit
Australian Trout and Salmon Farmers Association
Goulburn River Trout Farm
Box 69
Alexandra VIC 3714

11.37 Crocodile Farmers Association

Mr Neville Mitchell
President
Crocodile Farmers Association - Australia
PO Box 4600
Darwin NT 0801

11.38 Aquaculture Council of Western Australia

Mr Simon Bennison
Executive Officer
Aquaculture Council of Western Australia
c/o WA Fishing Industry Council
PO Box 55
Mount Hawthorn WA 6016

11.39 The National Library

Document Delivery Service
National Library of Australia
Canberra ACT 2600

11.40 Primaqa

Ms Liz Evans
PO Box 8007
Mail Centre Coffs Harbour NSW 2450

12.0 BIBLIOGRAPHY

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13.1 APPENDIX 1: Fish Health Coordinating Group

MEMBER	REPRESENTATIVE
SCARM Veterinary Committee (Chair)	Prof. Mike Rickard Chief CSIRO Animal Health
Secretary	Mr. Simon Wilkinson, AFFA
SCARM Office of Commonwealth Chief Veterinary Officer	Dr. Peter Thornber Special Veterinary Assistant, OCVO
SCFA Aquaculture Committee	Dr. Damien Ogburn NSW Fisheries
SCFA Environment and Health Committee	Dr. John Beumer QDPI (Fisheries)
Wild-caught fisheries Industry	Ms. Jayne Gallagher (ASIC)
FAB	Mr. Glenn Hurry Aquaculture Unit
BRS Technical Coordinator	Dr. Grant Rawlin Principal Veterinary Officer Technical coordinator
Aquaculture Industry	TBA
Co-opted member	Dr. Mark Crane Project Leader CSIRO AAHL Fish Diseases Laboratory

13.2 APPENDIX 2: Australian National List of Reportable Diseases of Aquatic Animals

Disease Agent	OIE listed	NACA listed	Exotic to Australia
FINFISH			
Aeromonas salmonicida (atypical strains)	No	No	No
Aeromonas salmonicida var. salmonicida (Furunculosis)	No	No	Yes
Aphanomyces invaderis (Epizootic ulcerative syndrome)	Yes	Yes	No
Channel catfish virus	Yes	No	Yes
Edwardsiella ictaluri (Enteric septicaemia of catfish)	Yes	No	Yes
Epizootic haematopoietic necrosis virus	Yes	Yes	No
Gyrodactylus salaris	Yes	No	Yes
Infectious haematopoietic necrosis virus	Yes	Yes	Yes
Infectious pancreatic necrosis virus	Yes	Yes	Yes
Infectious salmon anaemia virus	Yes	No	Yes
Myxobolus cerebralis (Whirling disease)	No	No	Yes
Oncorhynchus masou virus	Yes	Yes	Yes
Piscirickettsia salmonis (Piscirickettsiosis)	Yes	No	Yes
Renibacterium salmoninarum (Bacterial kidney disease)	Yes	Yes	Yes
Spring viraemia of carp virus	Yes	Yes	Yes
Viral Encephalopathy and Retinopathy	Yes	Yes	No
Viral haemorrhagic septicaemia virus	Yes	Yes	Yes
Yersinia ruckeri (Enteric redmouth disease/yersiniosis)	No	No	Yes (ERM)/No
CRUSTACEANS			
Aphanomyces astaci (Crayfish plague)	Yes	No	Yes
Baculoviral midgut gland necrosis virus	Yes	Yes	Yes
Baculovirus penaei	Yes	No	Yes
Infectious hypodermal and haematopoietic necrosis virus	Yes	Yes	Yes
Penaeus monodon-type baculovirus	Yes	No	No
Taura syndrome virus	No	No	Yes
Whitespot disease virus	Yes	Yes	Yes
Yellowhead disease virus	Yes	Yes	Yes
Necrotising Hepatopancreatitis	No	No	Yes
MOLLUSCS			
Bonamia ostreae (Bonamiosis)	Yes	Yes	Yes
Bonamia spp. (Bonamiosis)	Yes	Yes	No
Haplosporidium costale (Haplosporidiosis)	Yes	Yes	Yes
Haplosporidium nelsoni (Haplosporidiosis)	Yes	Yes	Yes
Marteilia refringens (Marteiliosis)	Yes	Yes	Yes
Marteilia sydneyi (Marteiliosis)	Yes	Yes	No
Mikrocytos mackini (Mikrocytosis)	Yes	Yes	Yes
Mikrocytos roughleyi (Mikrocytosis)	Yes	Yes	No
Iridovirosis	Yes	No	Yes
Perkinsus marinus (Perkinsosis)	Yes	Yes	Yes
Perkinsus olseni (Perkinsosis)	Yes	Yes	No

13.3 APPENDIX 3: Fish Health Management Committee

MEMBER	REPRESENTATIVE
Australian Chief Veterinary Officer (Chair)	Dr. Gardner Murray, OCVO, AFFA
Fisheries and Aquaculture Branch (Secretariat)	Mr. Glenn Hurry, FAB, AFFA
SCARM	Mr. John Pollock
SCFA	Mr. Alex Schaap
Aquaculture Industries	Mr. Richard Scoones, Australian Aquaculture Forum (AAF)
Wild-catch Fisheries	Mr. Brian Jeffries, Australian Seafood Industry Council (ASIC)
CSIRO Animal Health	Dr. Mike Rickard, CSIRO AAHL
Recreational Fishing Industry	Mr. Angus Horwood, RecFish Australia