

Aquatic Animal Health Emergency Management Training and Incident Simulation

Ms Melanie Ryan



**F I S H E R I E S
R E S E A R C H &
D E V E L O P M E N T
C O R P O R A T I O N**

PROJECT 2002/664

AQUATIC ANIMAL HEALTH EMERGENCY MANAGEMENT TRAINING AND INCIDENT SIMULATION

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Principal Investigator: Melanie Ryan

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Table of Contents

Non-technical summary	4
Acknowledgments	6
Background	7
Need	7
Objectives	8
Methods	9
Results	10
Benefits	18
Further development	19
Planned outcomes	20
Conclusion	21
References	23
Appendix 1	24
Appendix 2	24
Appendix 3	24
Appendix 4	25
Appendix 5	30
Appendix 6	71

Non Technical Summary

Project 2002/664 Aquatic animal health emergency management training and incident simulation.

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OBJECTIVES:

1. The identification of strategies to effectively manage aquatic animal health emergencies.
2. The provision of responsive aquatic animal health emergency training workshops for both employers and employees for each of the aquaculture industry sectors.

NON TECHNICAL SUMMARY

Following some initial research in 2001, it was found that the aquaculture industry lacked relevant training in emergency management procedures for aquatic animal health. There was a dangerous perception that all animal health matters were the preserve of external specialists and a few biologists within the industry. There was a singular lack of both knowledge and responsibility for aquatic animal health and in most cases not even basic procedures for managing a health emergency. This resulted in the development of a project to provide training to the industry on what to do, who to contact, what steps were required to deal with the emergency and how to contain it. The concept of a short workshop program to provide basic knowledge and some practical tools was seen as an important precursor to a larger industry planning process for aquatic animal health emergencies.

OUTCOMES ACHIEVED

1. The research phase of the project confirmed that the industry was ill prepared for any aquatic animal health emergency and had few strategies to effectively manage any emergency event. The lack of practical information on identification of likely diseases was a major impediment to any effective management strategy. The research findings demonstrated that a large number of operations had no employees with science qualifications or indeed any substantial expertise in internally managing health emergencies. This suggested that the workshops needed to target both growers and employees in an enterprise context.

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The research findings strongly supported an approach which would provide growers and staff with simple, practical information on how these events occur, what to look for, who to contact and how to contain an emergency. This would allow aquaculturalists to develop practical management programs for any emergency by having a basic understanding of the importance of disease management and in the absence of effective identification materials, a recognition of what steps are required to manage an emergency. The research emphasised that there was need for a workshop program that would provide a broader educative approach with some basic tools to assist the industry to adequately prepare for the subsequent development of more detailed sector emergency plans and tailor information to each enterprise.

2. The aim of the workshops was to provide industry personnel with practical tools to identify, communicate and manage aquatic health emergencies. The workshops also provided an opportunity to consider the broader range of aspects that can impact on aquatic animal health and provided aquaculture operators with a template which was valuable in developing either individual enterprise or sector approaches.

A total of five workshops were held throughout South Australia in Ceduna, Port Lincoln, Cowell, Port Adelaide and Robe. A total of 62 people attended the workshops. Workshop materials were also distributed to a further 38 companies who were unable to attend the workshops but requested copies of the materials.

Due to the diverse nature of the aquaculture industry in South Australia, its wide geographic spread, the varying skill levels of its operatives and a reasonably generic component to emergency response, the workshops were targeted at all industry sectors.

The workshops were well received and achieved feedback demonstrated that the format and level of information was about right for the audiences. The workshops also confirmed that knowledge and identification of disease remains a key gap area that will need to be addressed in a subsequent follow up program together with a more specialised series of sector initiatives. The industry identified that follow up activities will require better disease identification manuals and training in basic sampling as a necessary second stage of training to underpin any broader management initiatives.

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Mr Doug Parker, the Post Harvest Manager for the Australian Fisheries Academy provided key input on diseased product in the processing and marketing sectors of the industry.

Background

Aquaculture is the production of fish and shellfish for market under controlled or semi-controlled conditions. For commercial success, an aquaculture operation must maintain fish at densities that often greatly exceed those normally found in nature. Under these conditions, fish must not only survive but grow rapidly. Regardless of the culture system used, it is imperative that the culturalist maintain an environment conducive to good fish health.

Recent increases in environmental awareness, environmental monitoring and the move to develop environmental management systems for the South Australian seafood industry (such as the Green Chooser) has also highlighted the importance of establishing contingency plans and aquatic health management protocols. A wide variety of parasites and pathogens can and do infect fish. Most disease agents are naturally present when fish are in their natural environment and generally do not cause any significant problems. However, when fish that are already crowded in culture operations are further stressed, their natural defence systems may be weakened and the ability of the fish to protect itself against disease may be reduced.

Current husbandry practices and emerging technological advances generally ensure that known disease problems are kept to a minimum. However, in the event of a disease crisis, the South Australian seafood industry would be somewhat unprepared for rapid emergency action.

The development of proposed approaches to manage aquatic health emergencies at the national level has failed to engage growers in the development of practical and responsive action plans. Similarly, at a South Australian level, the level of support provided to growers for such issues as identification and containment practices has generally been poorly developed.

The South Australian seafood industry has been growing at a significant rate over the past twelve years and is the State's fifth largest export industry by value. The strongest growth has been recorded in the aquaculture sector of the industry which has a current production value of some \$400 million.

The aquaculture industry in South Australia is made up of both land based and marine based operations. The largest sectors are all marine based with tuna, marine finfish (yellowtail kingfish, mulloway and snapper) and oysters all strongly performing. The relatively new mussel industry is currently in a major expansion phase. The most significant land based industry is abalone, however, barramundi has cemented itself as a significant sector with further growth potential.

Need

The high growth and diversity of the South Australian industry has largely occurred without emergency management plans or training courses for fish health. Research priorities have tended to centre on the reproduction and grow out of new species and have often overlooked the potential threat from disease or the environment.

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The industry needs as a matter of urgency an immediate practical support program targeted at enterprise staff to ensure that it can adequately deal with any fish health emergency and meaningfully contribute to a wider sector management response. The continuation of a reactive stance towards disease management is hazardous, causing high risk to both the industry and the environment and greater exposure to negative public sentiment, let alone the potential for economic loss.

Training for the aquaculture industry is at an all time high in most operational areas and the two largest training providers, the Australian Fisheries Academy and the Spencer Institute of TAFE have been offering an array of programs and courses to meet the demand.

Seafood Training SA, the industry's peak organisation for training and development support, undertakes research on training needs and following a program of industry research in 2001, identified that the aquaculture industry lacked relevant training in emergency management procedures for aquatic animal health. Whilst basic training in aquatic animal health and emergency procedures forms part of the Seafood Industry Training Package, a large number of employers and employees have no formal training or access to materials that meet their specific needs. The issue was most evident amongst farm hands who make up some 90% of the workforce and often have wide ranging stock management responsibilities.

Following extensive industry consultations, a picture emerged of an industry that lacked even basic awareness of emergency management and expected specialist veterinary staff to simply handle all issues. The level of learning on aquatic animal health was extremely low in nearly all sectors which suggested that there would need to be a staged approach to develop emergency management procedures. The concept of delivering short workshops which could provide basic practical information was most favoured. Early information also suggested that core components such as having some ability to identify when stock was diseased and knowing who to tell were critical issues for the bulk of industry operatives.

The original concept also considered having separate workshops for each industry sector broadly to mirror the systems approach of Aquavetplan. The subsequent research showed clearly that this approach was out of step with the requirement for each sector to have core and generic information to begin to put in place relevant procedures.

Objectives

1. The identification of strategies to effectively manage aquatic animal health emergencies.
2. The provision of responsive aquatic animal health emergency training workshops for both employers and employees for each of the aquaculture industry sectors.

The thinking behind the second objective was that separate workshops would be developed and delivered for each sector. The research supported a more generic industry wide program which could be tailored if required by individual sectors or businesses. A secondary consideration in adopting this approach was the State Government's decision not to access Farmbis funding which effectively limited a wider or longer-term access to information through more structured sectoral workshops.

Methods

The first objective was undertaken through a program of research including desk-top research, industry contact, contact with research bodies and Government agencies. The desk-top research involved an assessment of any research projects dealing with the topic and particularly those that have looked at developing materials for aquatic health emergencies or workshop programs, a consideration of the AQUAVETPLAN Enterprise Manual as a reference document for the workshop materials and a wide ranging study of domestic and international information on aquatic animal health.

Industry, Government and research contact was undertaken through a series of mostly informal discussions. Discussions took place with Fish Health Officers, researchers in Tasmania, Western Australia and South Australia, the SA Aquaculture Council and representatives of industry associations in South Australia. Contact was made with personnel from a number of individual aquaculture enterprises in all major industry sectors. In most cases, this contact was with the business owner, although a number of marine biologists were specifically contacted in the larger businesses.

Key questions asked of industry personnel and researchers related to the current level of learning within the industry, the responsibility for aquatic animal health within the industry, the current system of communication for emergencies, the capability to support diagnostic work, knowledge about fish diseases, and the adequacy of the AQUAVETPLAN Enterprise Manual in providing a template for workshop materials (Enterprise Kit).

The approach used in this project was to look for ways in which enterprise personnel could be educated about aquatic animal health emergencies and respond effectively. The current level of knowledge and the capacity to implement were key issues which had to be clarified as part of the research.

Results/Discussion

Research phase

The research phase was intended to clarify the strategies which were appropriate for the management of aquatic animal health emergencies and which could meaningfully be covered in a short series of industry workshops. This meant that any intended strategies had to fit with the level of learning within the industry generally, tailor information to that level of learning and determine whether a sectoral approach with sector specific workshop materials was more relevant than a wider industry based approach. The original expectation was that the research would confirm the level of learning and how the workshops could meaningfully assist with the development of sector emergency plans.

The need for a balance between the biological perspective and operator competency was emphasised especially by industry personnel. Previous management approaches had assumed higher levels of operator competency than is the case. Other research studies into the management of aquatic animal health emergencies had focussed on the roles of veterinarians and technician/biologist personnel. The research confirmed that most growers and their staff had minimal competencies in identifying disease and generally no standard operating procedures for emergencies. The issue was a basic as not knowing who to ring if there was a suspected emergency and what simple steps might be taken within the farm to contain a health emergency. Industry personnel also stressed the need for any information or workshops to be suitable for farm hands who are in many cases the first person to witness disease events, particularly when working alone or unsupervised.

A small number of companies that had implemented quality or environmental management systems were better prepared for emergencies and these companies were usually quite large. However, a typical profile for operators was a small family business with less than ten employees. These businesses usually had no staff with marine biology qualifications and often the owner had no formal training in aquaculture or experience with fish diseases. A disturbing finding was that some sectors had an over-reliance on a single "expert" who would be called if there was a suspicion of an emergency. In some cases this was the Association President, in other cases it was a quality specialist or an industry employee who simply "knew about disease". The possibility of unavailability was simply not considered. It was interesting to note that most enterprises contacted were aware of State Fish Health Officers, but unaware of their role in an emergency or how to contact them.

Association personnel and growers contacted stressed the need for a generic program that could provide a "common" industry approach that would facilitate emergency response rather than a narrow sectoral approach that would result in different responses. This issue was seen as critical given the level of mobility within the aquaculture workforce, the need for all aquaculture employees to be aware of the steps that will effectively identify, communicate and contain aquatic animal health emergencies and the generally generic issues that each sector has to deal with in the event of an emergency.

Feedback on the approach suggested by the AQUAVETPLAN Enterprise Manual was not positive with the majority of the comments suggesting that the issues concerning aquatic animal health emergencies were more basic and generic when dealing with an emergency and that segmenting aquaculture by system was not relevant to how employees deal with such issues. Similarly, there was strong feedback that managing a health emergency involved a relatively small series of steps that for all sectors were broadly the same. Given that there was considerable confusion on such matters as basic identification and basic communication, the likelihood of any meaningful management training for emergencies that failed to address these issues would have resulted in the workshops being largely ineffective. This had significant implications for the ultimate design of the workshop program and materials.

Previous fish health issues had largely been parasitic although one important instance in the tuna industry had involved algal blooms. The biggest fear stressed by growers was recognising a disease that could decimate fish stocks. An important early finding of the research phase was the lack of a simple disease recognition guide for common species. The paucity of information on practical and visual recognition was seen as a major impediment to having an effective identification program for industry personnel. This was further emphasised by industry personnel throughout the workshop program. A number of industry personnel commented that the industry needed a more comprehensive disease identification manual for each major industry sector which covered all notifiable diseases and recognised non notifiable diseases. Comments on the Herfort manual were very positive and most industry personnel felt that a similar series of manuals with plain English (non-technical) descriptions would greatly assist all growers and their staff. The issue was quite fundamental to the development of a successful management regime. The lack of ability to recognise an emergency will directly impact on any management system however well structured.

Some comments suggested that having basic information on issues that affect fish health should be provided at a species level as most growers only grew one species. However, it was recognised that some diseases had the potential to affect a number of individual species even if there were currently no recorded cases for a particular species. It was pointed out to growers that the production of a comprehensive identification manual was outside of the scope of the project but would be a firm recommendation for further urgent research.

The research phase was intended to clarify the most appropriate strategies for the conduct and content of the workshops and in this matter two main strategies were originally considered.

The first was to provide an overview of sector health issues including common diseases to individual sectors and assist in formulating an enterprise response whilst describing a basic framework for the development of a more comprehensive sector management response. This approach would utilise the Enterprise Manual as a reference tool and look at some sector specific issues.

The second was to look at a wider industry program which would deal with more generic responses in the development of emergency plans that would pick up the more generic sector issues.

The research provided clear and unequivocal information that neither scenario was appropriate. The key finding from the research was that the level of knowledge and the basic understanding of what might be involved in an emergency did not support a more comprehensive planning process in the workshops. The research findings strongly favoured a strategy which was focussed on providing a basic set of information pitched at the level of growers and their staff rather than veterinarians or tertiary qualified technicians. In terms of the structure of the workshops and the information to be covered, the majority of growers strongly supported a “keep it simple” practical approach which focussed on identification, reporting, response and action. Growers stressed that there was a lack of information on what signs to look for, who to contact and what to do if they suspected there was an emergency. The agreed workshop program was to be designed around five elements:

- A basic review of AAH at the local/state/national level
- Definitions of disease (host/pathogen/environment/exotic/endemic) and basic observations of disease
- Contingency planning/developing standard operating procedures
- Points of contact in the event of an emergency (local/state/national)
- Translocation/quarantine

The proposed structure was subsequently refined to provide a focus on generic issues whilst introducing information on some common diseases. The intent was to provide a shock tactic approach to get participants to commit to the development of suitable operational procedures. A central part of this strategy was a “Think the Worst First” approach to ensure that industry personnel did not develop a wait and see monitoring mentality.

The research confirmed that a series of local workshops should be offered across the State to ensure that as many growers and personnel could attend. The Project Management Committee agreed that a total of five workshops should be held across the State in Ceduna, Port Lincoln, Cowell, Port Adelaide and Robe. Preliminary information was sent out to industry associations regarding the workshops and further contact made as workshop dates were confirmed.

It was agreed that the material to be distributed at the workshops should maintain a generic focus but allow individual sectors or businesses to further contextualise to their own situations. Distribution of the materials via email would then allow each association to undertake any further contextualisation.

Summary and Discussion of the research phase

The research findings set a new and more simplistic direction for the provision of information on managing emergencies based on reliable feedback from the industry. The research confirmed that there was little value in having a sector management system that relied on communication from farms that in many cases would not know

what to look for or how or when to communicate. It was found that developing some basic awareness and to a lesser extent competence in the workforce would provide for a rapid and more robust management system. The approach taken then was to focus the information more on the managers and employees which would be more beneficial in developing a chain of response and responsibility when an emergency occurs. This was in line with the original objective of empowering industry personnel in managing health emergencies and providing a clearer bottom up management approach to underpin any sector management models. The eventual model then emphasised effective farm responses with the support of designated State fish health personnel.

The inclusion of examples on “devastating diseases” and the list of reportable diseases was seen as an important educative tool rather than an attempt to instruct operatives in identification of pathogens. The lack of a proper identification guide for common health issues also made it difficult to ensure operatives were able to identify a particular problem and communicate it. Thus the response at the initial identification phase was viewed as fundamental to an effective management strategy and the form of the information focussed on a think the worst first mentality rather than observe and monitor.

The lack of personnel in remote regional areas who can assist when an emergency is suspected also provided clear evidence that closing the door before the horse bolts by implementing on-farm identification and containment measures was a preventative strategy that would clearly facilitate the effectiveness of any sector or regional emergency plan. In this regard, the research has provided some clear directions for follow up work, particularly the urgent need for a simple field identification guide for common health issues, such as is used in Japan, and in the need for a more practical operative training program in sampling supported by a disease investigation kit such as has been developed in Tasmania.

With some 25% of farm operatives having been trained to at least Cert II and in many instances Cert III under the SITP, there are good foundation competencies for specimen collection. However, a specific training program would need to be established and run in conjunction with State Fish Health Officers. Any specimen collection and transportation tasks from such a program would need to meet the requirements of both the geography of the industry and the requirements of fish health laboratories.

Training workshop phase

One of the intentions in the original concept was to trial the training workshops with a sample of enterprises prior to conducting full workshops. This was deemed to be not relevant due to the high quality of information gleaned from the initial industry contact and some clear directions for content and format emanating from the literature search. The original thinking behind a limited trial was that a document would be trialled with a small group of companies and refined for the larger workshops. As the final workshops would have also produced further refinements and additions to the

material, it was felt that the regional workshops would provide a better range of information for finalising the material.

The decision was also influenced by feedback from growers that suggested there should be some contextualisation of the material for specific sectors/companies following the workshop delivery. It is worthy noting that the shift in thinking away from a narrower training concept to a more interactive workshop approach supported the notion of changing the workshop material after delivery of the workshops.

The SA Aquaculture Council was informed about the workshops at its full Council meeting and all Association Presidents were requested to notify their members of the workshop program when dates were confirmed. Some Associations were more effective in their marketing than others and this ultimately affected the response levels in the various workshop locations.

A number of individual growers were also contacted directly to ensure the message on the workshops was being delivered. In some cases, they had already been advised by their associations, in others, they were unaware until contacted.

The two Registered Training organisations currently delivering aquaculture training to the industry in South Australia were also invited to attend the workshops as well as one secondary school specialising in School Based Apprenticeships in Aquaculture.

Formal invitations to the workshops were sent to all aquaculture associations and 116 individual companies. Several associations distributed the information to all their members. The Inland Aquaculture Association contacted over 170 growers, the SA Oyster Growers Association contacted all 100 members, the SA Marine Finfish Farmers Association contacted all their 13 members and associate members. Tuna farm operators, abalone growers and key freshwater crayfish growers were also contacted. In all, some 450 growers were contacted either directly or indirectly out of a total State register of some 860 licensed growers.

An advertisement was placed in the Eyre Peninsula Tribune advertising the Cowell Workshop program. The Cowell workshop was a little different to the others in that a renowned fish health expert, Dr Mark Sheppard was giving a talk on marine finfish health issues after the morning AAH emergency workshop.

A number of apologies were received for the workshops due to workload and the emerging Christmas/New year period. Where these apologies were provided prior to the workshops, copies of the workshop materials were sent out directly. A total of 38 copies were mailed to individual growers who rang in. A total of 51 companies apologised on the day of the workshop and requested copies of the material be emailed or mailed to them. This was subsequently done after a number of changes were incorporated.

In accordance with the agreed program, a total of five workshops were conducted in one city location and four regional locations during November and December 2002. The workshops lasted between one and a quarter hours and two and a quarter hours. Three workshops lasted approximately two hours. Attendance at the workshops varied but key industry personnel from all sectors were in attendance

along with the major training organisations and one secondary school that delivers School Based Apprenticeships in Aquaculture.

A total of 62 persons attended the five workshops.

The first workshop in Port Adelaide was run jointly by the Principal Investigator, Melanie Ryan and Mark Cody. The remaining workshops in Robe, Port Lincoln, Ceduna and Cowell were run by Mark Cody. Each workshop took the form of a general introduction, a twenty minute overhead presentation covering key points in the workshop handout and a question and answer session. Participants were encouraged to ask questions throughout the overhead presentation and some sessions were highly interactive. In the case of the Robe and Port Lincoln workshops, there were extensive discussions after the formal workshop in a more informal atmosphere. Information from the workshop conducted in Cowell featured in the following marine finfish workshop conducted by Dr Mark Sheppard.

The workshops provided an ideal avenue for talking about “common industry procedures” such as visiting neighbouring farms when there was a problem with the fish, sending long dead samples for analysis and simply leaving possible problems observed on a Saturday until the following Monday. Participants were challenged to respond to a hypothetical emergency situation when due to a special local event on a weekend, no-one was contactable. None of the workshop participants were able to identify what steps to take in such a situation highlighting that there was either an over-reliance on a single person, usually the Association President or an expectation that emergencies only occur during office hours.

Workshop participants freely volunteered that they had little knowledge about the range of diseases that might affect their stock and none had any method of identifying disease trends. Even though much of the information was in a basic form, most participants confirmed the need for simple information that could be used by all personnel, particularly for training.

The workshops confirmed that most farms did not have specialist technical staff who could deal with potential AAH emergencies. This meant that the information had to meet the needs of farm staff and steer personnel towards people who could make sound judgments, organise samples, make decisions and control any outbreak. For most farms which are located in remote regional areas, participants confirmed that there were no suitable local veterinarians who were skilled in fish health matters. It became clear that the Association President or a designated quality assurance person would be the first points of contact in an emergency by most growers rather than Fish Health Officers. In fact, the whole method of identifying, communicating and managing AAH emergencies was, as expected from the research phase, still poorly developed. Participants were not aware of the dangers of carrying potentially diseased stock from the affected farms or their transfer from boats or ponds to analysis and despatch areas.

The decision to introduce the sessions with case studies that provided examples of diseases that have devastated aquaculture industries was well received. It set the tone for the rest of the workshops.

The structure of the workshops followed the format agreed by the Project Management Committee focussing on observational signs of disease and adverse environmental factors, points of contact in an AAH emergency, basic contingency planning and standard operational procedures, translocation issues, relevant government legislation, further references on AAH, the OIE and notifiable diseases and information from the Aquavetplan Manual.

The workshops provided some valuable information regarding current gaps in information or systems. Chief amongst these were the need to have a practical and visual disease manual for each sector featuring common and likely diseases and the need for staff to not only be aware of their responsibilities in an AAH emergency but be able to fulfil any obligations and expectations through standard practices. Few growers had seen the Herfort manual but most agreed that a similar format that provided information on common diseases with possibly some examples of algal bloom or toxic waste impacts would be useful.

A number of growers felt that skilling employees in sampling would be of assistance in broadening knowledge about the particular species being farmed and assist the diagnostic process. Other participants expressed concern that sampling required specific training but were pleased to see that it will be considered as part of a more comprehensive training program for operatives to be developed in conjunction with Fish Health Officers.

A few growers commented on the lack of a laboratory in the Eyre region where some 90% of all South Australian aquaculture is practised. Transporting times for samples to laboratories in Adelaide was recognised as a key problem and produced some good discussions on ways to get product there quickly. Some road transport companies and pick up points for IMVS were discussed and viewed as more reliable than Australia Post.

Numerous participants spoke favourably about the workshop materials and the level of language used which they felt helped them understand some basic AAH issues. Most participants understood and favoured a "think the worst first" approach using the emergency points of contact list. It was interesting to note that the initial research confirmed that most growers had little knowledge about the range of diseases that might affect their stock and none appeared to have any method of identifying trends. A few land based growers used monitoring sheets but not for trend identification for AAH. Several suggested that some minor modifications to existing sheets could accommodate this need. A number of participants requested that a template sheet be developed that could be used to record behavioural trends such as "fish sluggish, not taking much food etc".

Communication was an area of considerable weakness for most participants. Many had no idea who to ring if there was a problem, especially out of hours. Having a central 24 hours number connected to State Fish Health Officers was seen as a positive move, even if the system was found to be non-operational during the research phase, a matter that was subsequently rectified.

The role of the State Fish Health Officers was discussed at all the sessions. Whilst they were not in attendance their role was supported provided they understood how

the industry worked. In this respect, several speakers commented on the need to develop practical AAH measures with the officers prior to developing policies in support of AAH. A couple of speakers welcomed the proposed program of contact with the industry that they are hoping to schedule during 2003.

Some participants asked if they could have a specific finfish or mollusc manual without any references to issues for the other species. As much of the information is generic, the changes required to achieve this were relatively small. Two separate manuals were subsequently produced to achieve this but were not supported by the Project Management Committee which felt that it was better to have a broader perspective on AAH matters in a generic manual.

A few participants discussed the possibility of engaging the local veterinarian as part of any identification and management regime. The lack of specific aquatic training was seen as the principal impediment especially in rural areas where the local VET specialises in sheep, cattle, horses, dogs and cats. The suggestion of a register of VET's with skills in the aquatic field was seen as a valuable addition to a contact list and was to be followed up with PIRSA.

Environmental issues were viewed as an important potential problem area, particularly from ballast water and algal blooms. The remote possibility of a toxic waste spill was also a concern given the range of chemicals in use in regional farming communities. These issues were valuable in the "what if" scenarios considered during the workshops. Once again, the emphasis on thinking the worst even if there was little technical knowledge on the issue was critical in formulating any kind of response.

Summary and discussion of the workshop phase

The feedback provided immediately after the workshops and subsequent to them showed that most participants thought the workshops were about right regarding the level and content of the information provided. The workshops provided a forum for a free and frank discussion on a range of AAH issues and it became clear that most participants were not well placed to deal with any emergency.

The most important outcomes were a ready acceptance of the two handout sheets entitled "Points of Contact in the Event of an Emergency" and "Think the Worst First", a basic four step approach in dealing with aquatic animal health emergencies. Participants were encouraged to have both sheets prominently displayed in key work areas such as lunch-rooms and sheds.

The workshops appeared to have been well timed given that the industry was particularly receptive to the issue following a number of incidents in other States and overseas. As a training and learning tool, the workshops highlighted that the industry is still at a fairly basic level of learning regarding AAH emergencies. The workshops demonstrated that there remains a culture of dependence on external specialists which can be a recipe for disaster. While developing a culture within each enterprise to effectively manage AAH emergencies will take time, the materials and workshop discussions clearly impacted positively on a number of organisations who will

continue to become involved in sector management issues and become local champions for more effective management systems.

Several participants mentioned that the industry needed to be trained further with tools such as disease identification manuals and better knowledge of physiology for farm operatives. This suggests that there is a firm need to develop such tools in a follow up program for all sectors nationally. In terms of further learning, the Seafood Industry Training Package has provided a range of competencies which deal with most of these issues, but the lack of interest in up-skilling combined with public funding restrictions for vocational education and training above Certificate III, mean that this will be a longer term process. A follow up series of workshops dealing specifically with practical skills in such areas as sampling will, according to the industry participants, build further confidence in managing AAH emergencies. Whilst there is a school of thought that a little knowledge can be dangerous, virtually no knowledge by key operatives can be catastrophic.

One of the things that this workshop program has shown up is that the issues surrounding the farm response in identifying, alerting, responding and controlling an AAH emergency are broadly generic. Operators and managers call the same number for advice and notification irrespective of which sector they operate in. Educating each individual farm to contact Fish Health Officers when identifying and containing an emergency is preferable to relying on third parties who may or may not need to be notified initially. The workshops stressed the need to ensure that these officers are the first point of call for a suspected AAH emergency.

The management of information and the measures to be put in place with respect to an emergency then rest with the Fish Health Officers. Each sector will, in time, develop an adequate sector management plan which will incorporate any sector responsibilities especially relating to such things as sector wide information dissemination, media contact etc. However, the control for a sectoral response still rests largely with the Fish Health Officers. This suggests that effective sector plans must be based on the kind of "foundation" issues identified in the workshops to ensure that the system works for individual farms as much as it does for a whole industry sector. Whilst the development of detailed sector plans and responsibilities is an exercise outside of this small project, the awareness of AAH emergency issues and the basic tools generated by the project would appear to have provided a solid foundation for the development of such plans.

Benefits

The project was specifically designed as a pilot AAH training program for the South Australian aquaculture industry. The Inland Aquaculture, Freshwater Crayfish, Tuna, Marine Finfish, Abalone, Oysters and Mussels sectors all participated in the research and workshop phases of the project. The training and workshop materials have and will continue to benefit all these sectors in varying degrees by imparting knowledge on AAH issues, procedures and management and providing a template to more effectively notify health issues when they arise.

The aquaculture industry in South Australia is worth some \$400million annually and to date has managed to grow strongly with few AAH incidents. The possibility of an enterprise not identifying an aquatic health emergency be it an environmental factor or a disease that has the potential to decimate current stocks can have a very serious impact on the future of the industry itself. With the current farmed tuna value of over \$310million, the marine finfish industry value of \$35million, the oyster industry value of \$15 million and the abalone industry value of \$10 million alone, any AAH impact has the potential to result in a multi-million dollar economic loss. The employment impact of an unmanaged disease event for instance, could result in significant job losses and a severe impact on a number of small regional communities throughout the State.

The workshop programs, together with a limited distribution of workshop materials to aquaculture enterprises, have provided practical information regarding the steps that are needed to effectively manage an AAH emergency at an enterprise level. This information was not generally known by most operatives in most enterprises prior to this project and as a consequence, the material is likely to have a long term benefit for all enterprises in the industry.

At an enterprise level, the workshop materials have been produced in a form that allows each enterprise to use the information for induction and AAH management. This has been entirely consistent with the outcomes envisaged in the original research application.

Further Development

There are three further development issues that have arisen from this project. The first relates to the need to provide farm operatives with adequate identification manuals so that they are able to work with practical and visual fish health guides. As outlined earlier, the sectors recommended that the manuals should be sector specific for finfish, molluscs and crustaceans rather than covering all sectors as in the Herfort manual. It was mentioned at one workshop that the Japanese have produced such manuals for a wide range of AAH issues.

The second relates to the need for effective sampling to support the analysis phase of a health emergency. This was seen by the industry as an important way of supporting any pathological investigation and gaining a better understanding of the species being farmed. Once again, the industry made it clear that this was seen as a very important step in broadening knowledge on physiology and fish health generally and would not detract from appropriate judgements on health matters. It was interesting to note that the Tasmanian Disease Identification Kit was seen as a suitable industry kit supported by a yet to be developed targeted sampling training program offered by fish health officers.

The third further development need is to have the procedures in the workshop materials incorporated into a larger fish health policy manual for each farm including a summary on the enterprise procedures (taken from the workshop materials), a summary of the steps to be taken by the relevant sector body and a copy of the relevant fish health guide for each farm. The electronic distribution of the materials

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clearly supports the ability of the materials to be tailored to each farm, both by enterprise headings and any local arrangements that may apply in managing AAH emergencies.

Clearly, the relatively low level of knowledge on AAH on most South Australian farms suggests that this may be a common problem nationally. The generic nature of the materials allows similar workshops to be convened in all States and Territories and used as part of the delivery of the Seafood Industry Training Package by Registered Training Organisations nationally.

As a first step, the workshop materials as they currently are, or in an improved enterprise specific AAH Manual, need to be included in any quality management system being developed by aquaculture enterprises.

Planned Outcomes

The outputs from the project were a series of workshops on aquatic animal health emergencies for the South Australian aquaculture industry and a set of workshop materials to assist individual aquaculture enterprises develop suitable emergency management arrangements.

Both outputs were the result of an extensive research phase which involved both desktop and industry research. The outcomes specified in the project application were:

- An identification of appropriate strategies to deal with likely aquatic animal health emergencies and;

- The development and delivery of a comprehensive training program to assist businesses to effectively manage disease events.

The research phase of the project clearly provided information that the industry was not well positioned to embark on complex strategies to manage AAH emergencies. This suggested that an appropriate response would be to focus information on AAH emergencies at a more generic level consistent with the level of learning and expertise commonly found on most farms. The workshops would then focus on strategies that empowered employees and managers with some basic identification and communication skills, essential to a rapid response emergency management regime.

The resultant workshops were designed around these identified needs and conducted across South Australia in five locations in late 2002. The workshops were promoted through the SA Aquaculture Council, all aquaculture industry associations and to individual enterprises and were attended by 62 persons. Distribution of workshop materials was also undertaken to businesses unable to attend the workshops. The workshops met their goal of delivering a training program which assisted aquaculture businesses to implement an AAH emergency management system based principally around management of disease.

Conclusion

The outcomes specified in the project application were:

An identification of appropriate strategies to deal with likely aquatic animal health emergencies and;

The development and delivery of a comprehensive training program to assist businesses to effectively manage disease events.

In looking at appropriate strategies for AAH emergencies, regard was paid to the level of expertise in the industry, current arrangements for identifying, communicating and managing AAH emergencies, and previous attempts to assist the industry in implementing appropriate AAH emergency management systems.

The result of this research was that one strategy was deemed appropriate, a simple plain English information format targeted at the widest range of industry operatives. This was chosen instead of technician level programs as the industry is largely made up of non-technician employees. In fact some sectors have very few marine biologists or even qualified aquaculture technicians. The most important consideration however, was to ensure that the people who were most likely to encounter an AAH emergency, fish farm hands and supervisors, had sufficient knowledge to effectively and expeditiously communicate that there may be a problem. Without even a basic knowledge of common disease traits or fish behaviour that might indicate a health emergency, the likelihood of any reporting, let alone relevant reporting was low. This may well be the case across the industry nationally.

Information from the research phase supported the development of a workshop program more than a formal training program. This was due to a number of factors such as resistance to formal training, the information being better delivered in a workshop format, and lack of funding to support training delivery.

The resultant workshops were delivered in major aquaculture “regions” of the State to allow for maximum local access. The materials developed for these workshops had been designed for the target groups identified in the research, farm hands and farm managers. The content of the materials was designed to meet the basic awareness needs of the industry, some simple identification, communication and planning steps that farm operatives can take and a series of reference tools for managers and staff to develop some further knowledge on AAH emergency management. It should be stressed that at no stage was the project to develop detailed enterprise or sector AAH emergency management plans. The second project objective was “The provision of responsive aquatic animal health emergency training workshops for both employers and employees for each of the aquaculture industry sectors.” As the research clearly supported the delivery of responsive information on AAH emergencies, the research findings became the principal determining factor in what was to be delivered.

What this project has strongly demonstrated is that AAH emergency management responses need to have managers and employees skilled in rapid identification of possible emergencies and the basic skills to communicate and isolate movements

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until the problem has been identified by specialist Fish Health personnel within Government. By promoting a “Think the Worst First” mentality, a desirable preventative management response is more likely across the sectors.

References

Key resources used in the project which enhanced the research included:

Australian Aquatic Animal Disease (Herfort/Rawlin)

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

AQUAVETPLAN Enterprise Manual

FRDC Project 95/087 - Aquatic Animal Disease Preparedness Assessment

FRDC Project 2000/149 - AAHL Fish Diseases Laboratory Bacteriology Workshop

Animal Health Australia - National Emergency Animal Disease Preparedness Program Training Centre

Aquaculturalists Guide to Harmful Australian Microalgae (Hallegraeff)

CSIRO - AAHL Fish Diseases Laboratory

Fish for the Future - Translocation

Appendix 1:

Intellectual Property

As the project materials are intended to have the widest industry distribution, the intellectual property issue relating to both the Report and the project materials is not meant to restrict any access either by the industry or other researchers. It is intended that the intellectual property rights be jointly owned by Seafood Training SA Inc and FRDC on the basis of 47% and 53% respectively.

Appendix 2:

Staff

Two staff were engaged on the project, Ms Melanie Ryan, Principal Investigator, and Ms Donna Kingston, Office Manager. The Executive Director, Mark Cody, is a consultant to Seafood Training SA Inc. and was involved in overseeing and undertaking some aspects of the project.

Appendix 3:

The project utilised a range of reference materials as listed under the Reference Section. However, information from the "Disease Investigation Kit" from the Fish Health Unit of the Department of Primary Industries, Water and Environment (Tasmania) was used as part of the project.

Appendix 4:

Attendees at the Aquatic Animal Health Emergency Training Workshops

Name	Sector
Robin Moseby President Inland Aquaculture Association PO Box 387 Kent Town SA 5071	Inland Aquaculture
Hagen Stehr AO Chairman Stehr Group PO Box 159 Port Lincoln SA 5606	Tuna and Marine Finfish
Lyndon Giles Southern Star Aquaculture PO Box 256 Whyalla SA 5600	Marine Finfish
Tony McFarlane Cowell SA 5602	Oysters
Simon Turner Turner Aquaculture 27 North Terrace Cowell SA 5602	Oysters
Geoff Turner Turner Aquaculture 27 North Terrace Cowell SA 5602	Oysters
Lee Rodgers Southern Star Aquaculture PO Box 256 Whyalla SA 5600	Marine Finfish
Allan Crosby Stehr Group PO Box 159 Port Lincoln SA 5606	Marine Finfish
Ross Gordon Marine Biologist Stehr Group PO Box 159 Port Lincoln SA 5606	Tuna and Marine Finfish
Scott Schilg SA Aquaculture Management PO Box 364 Whyalla SA 5600	Marine Finfish

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Tom Bayly Pivot Ltd PO Box 1615 Port Lincoln SA 5606	Tuna/Aquaculture Feeds
Geoff Bayly Pivot Ltd PO Box 1615 Port Lincoln SA 5606	Aquaculture Feeds
Stephen Clark General Manager Clean Seas Aquaculture Arno Bay SA 5603	Finfish Hatchery
Bruce Vincent Grow Out Manager Clean Seas Aquaculture Arno Bay SA 5603	Marine Finfish
Kerry Bunsar Cowell SA 5602	Oysters
Tony Schultz PO Cowell SA 5602	Oysters
Steven Pope H&M Pope Cowell SA 5602	Oysters
Henry Pope H&M Pope Cowell SA 5602	Oysters
Terry Rehn Cowell Oysters Lot 26 Oyster Drive Cowell SA 5602	Oysters
David Pepper Cowell SA 5602	Oysters
Lorraine Walford Cowell Area School Cowell SA 5602	Cowell Area School
Tom Kenny Cowell Area School Cowell SA 5602	Cowell Area School
Tony Schutz Cowell SA 5602	Oysters
Mark Sheppard Marine Biologist Vancouver Canada	Marine Finfish
Andrew Tindale Spencer Gulf Aquaculture PO Box 2010 Port Augusta SA 5700	Marine Finfish

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Alastair Smart PO Box 1962 Port Lincoln SA 5606	Mussels/Fin Fish/Consultant
Peter Parry Eyre Aquaculture 5 French Street Broadview SA 5083	Marine Finfish
Joe Ciura (2 workshops) Navajo PO Box 2085 Port Lincoln SA 5606	Marine Finfish
B Swincer Cowell SA 5602	Oysters
Terry Bryant Navajo 30 North Quay Boulevard Port Lincoln SA 5606	Marine Finfish
Andy Dyer SA Mussel Growers 16 Gawler Terrace Port Lincoln SA 5606	Mussels
Mike Stockdale Spencer Institute of TAFE London Street Port Lincoln SA 5606	Spencer Institute
Bill Lussier Spencer Institute of TAFE London Street Port Lincoln SA 5606	Spencer Institute
Mark Stewart Australian Fisheries Academy North Quay Boulevard Port Lincoln SA 5606	Aust Fisheries Academy
Doug Parker Australian Fisheries Academy PO Box 2099 Port Adelaide SA 5015	Aust Fisheries Academy
Bruce Zippel 1 Decres Bay Road CEDUNA SA 5690	Oysters
Leon Stott Clear Water Oysters PO Box 351 Ceduna 5690	Oysters
Lee Cunningham Destiny Group 2 King Street Port Lincoln SA 5606	Abalone

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Craig Kelly SA Mariculture PO Box 2260 Port Lincoln SA 5606	Abalone
Darren Tressider Australian Fishing Enterprises PO Box 1073 Port Lincoln SA 5606	Tuna
Mr and Mrs David Stanhope Robarra Box 24 Robe SA 5276	Inland Aquaculture
Lou Spehr Millicent SA 5280	Inland Aquaculture
Bill Mersh Murray Mallee Research and Recreational Fish Farm Tailem Bend SA 5260	Inland Aquaculture
Adrian McIntyre Aquatech Old Noarlunga SA 5168	Inland Aquaculture
Martin Daintith Spencer Institute of TAFE London Street Port Lincoln SA 5606	Spencer Institute
Ziggy Veldhuyzen Spencer Institute of TAFE London Street Port Lincoln SA 5606	Spencer Institute
Bruce Hay Marino SA 5043	Inland Aquaculture
Geoff Materne Clearwater Fish Co Clarendon SA 5157	Inland Aquaculture
Malcolm Nottage Kangarilla SA 5157	Inland Aquaculture
Glen Sheehan Inish Pty Ltd Clarendon SA 5157	Inland Aquaculture
Andrew Hayes SEAS PO Box 43 ROBE SA 5276	Salmon
Nick Roberts Address not given	Inland Aquaculture
Robert Leverinton Address not given	Inland Aquaculture
Mary Ross Address not given	Inland Aquaculture

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Joe Tuma Aquatech Old Noarlunga SA 5168	Inland Aquaculture
Steve Shotton B&S Aquaculture Technology PO Box 157 Stirling 5152	Marine Finfish
Chris Brooks Address not provided	Marine Finfish
Julie Hopman Address not provided	Marine Finfish

Appendix 5:

Workshop Material

**AQUATIC
ANIMAL
HEALTH
EMERGENCY
TRAINING
WORKSHOP**

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INTRODUCTION

Many serious diseases that have limited and even destroyed overseas aquaculture production are currently still foreign to Australia. Whilst at present this is good news for Australian aquaculture, we risk becoming complacent and ill equipped to deal with sudden emergencies that are really inevitable.

Past aquatic health emergencies have identified that the incidence of disease outbreaks rises with increasing production levels and the culturing of new species. So, effectively as our industry grows and develops the potential for an aquatic animal health emergency increases.

So what is an aquatic animal health (AAH) emergency?

It is an emergency situation caused by a disease that is affecting stock. This may also include environmental disasters such as plankton blooms etc

So who is responsible for the control of Aquatic Animal Health?

In a word – YOU!

This workshop is a 'For Your Information' session which will provide you with some simple procedures and references to design an appropriate enterprise response.

The session will include:

- 1. Case studies from around the world**
- 2. Observational signs of disease and identifying trends**
- 3. Points of contact in the event of an emergency**
- 4. Basic contingency planning/standard operating procedures in the event of an AAH emergency**
- 5. Translocation**
- 6. Government legislation and regulation.**
- 7. Status of AAH in Australia**

Please note: For the purpose of this workshop: 'Fish' includes finfish, shellfish, molluscs and crustaceans, unless specified otherwise.

SECTION 1

CASE STUDIES FROM AROUND THE WORLD

The following case studies are indicative of the impact of some aquatic diseases.

Some of these may never affect our industry but others with a similar impact have the potential to decimate the industry. Each Case Study offers a serious lesson for us.

SECTION 1

A. HAPLOSPORIDIUM NELSONI (MSX) OF OYSTERS

THIS DISEASE HAS DECIMATED THE OYSTER INDUSTRY IN CHESAPEAKE AND DELAWARE BAYS - FARMS ARE STILL RECOVERING TO THIS DAY!

Host Species:

A) *CRASSOSTREA VIRGINICA* (SIMILAR HAPLOSPORIDIANS FOUND IN OTHER BIVALVE SPECIES WORLD WIDE).

b) *Crassostrea gigas*

Impact on the host

Mortalities can reach 90% to 95% of the oysters in a cohort within 2 to 3 years of being out-planted. When the disease first appeared in the late 1950s and early 1960s, mortalities of adult *C. virginica* approached 100% of the standing stock during a 3 year period in the high salinity areas of Chesapeake and Delaware bays (Andrews and Wood 1967, Ford and Haskin 1982).

Mortalities may commence early in the spring (infected animals unable to recover from the metabolic demands of over-wintering) and infection of new oyster hosts occurs primarily in that season.

Mortalities from new or recurrent infections occur throughout the summer and peak in August-September.

The life cycle of *H. nelsoni* is unknown.

Sporulation of *H. nelsoni* is sporadic in adult *C. virginica* but prevalent in juvenile oysters. When present, it occurs in summer and causes a gradual disruption of digestive tubule epithelia. Sporulation in juvenile *C. virginica* was associated with mortality rates of at least 30% in infected spat (Barber et al. 1991b, Burreson 1994). Transmission directly between oysters has not been accomplished; requirement for an intermediate host is suspected.

DNA analysis indicates that *H. nelsoni* was introduced to the east coast of the United States from California or from Asia with documented plantings of *C. gigas*.

Extract taken from www.pac.dfo.ca/sealane/pacific.htm - Fisheries and Oceans Canada)

B. THE GYRODACTYLUS SALARIS PARASITE

IN THE PAST THIS DISEASE HAS CAUSED ALMOST COMPLETE DEVASTATION TO BOTH THE NORWEGIAN AQUACULTURE INDUSTRY AND THE WILD FISHERIES!

Gyrodactylus salaris is a salmon parasite common throughout most of Finland. It does no harm to Baltic salmon or rainbow trout but if it gets into the northern salmon rivers it could destroy their entire stock of valuable Atlantic salmon in just a few years!

Gyrodactylus salaris is a tiny animal about half a millimetre long that lives on the skin of river salmon fry. It clings to its host with sharp barbs and eats its skin at this point, making tiny G. salaris wounds that weaken the fish.

The offspring are born alive, already carrying new offspring inside them. Each foetus itself contains the beginnings of new foetuses. The parasite thus consists of 3-4 animals. Once G. salaris has spread into a river it takes only a few years to kill all the salmon fry, so destroying its entire stock of salmon.

G. salaris can also live on the skin of other fish of the salmonidae family, apart from salmon fry, without causing much visible damage. It multiplies on salmon, rainbow trout, grayling and char but can also survive for short periods in sea trout, eels and flounders.

Where is Gyrodactylus salaris found?

G. salaris was first encountered in Norway in 1975, possibly having been spread there on fish transported from Sweden.

It has so far been encountered in 38 Norwegian salmon rivers although it has subsequently been eradicated from some of them. In the close vicinity of Finnmark it has been encountered in the River Skibotn in Norway and the River Tornio, on the border between Finland and Sweden.

The parasite has also been noted in six Swedish salmon rivers. In Russia it has been found in the River Kieret, which discharges into the White Sea, as well as rivers flowing into Lake Onega and Lake Ladoga.

G. salaris has been found in numerous rainbow trout and salmon farms in Finland, Sweden and southern Norway. In Finland it was also encountered in the artificial basins of a fish farm near Lake Inari. The farm was bought by the government and will be closed because its location was seen as posing a threat of contagion to Atlantic salmon stocks in Arctic rivers.

How is Gyrodactylus salaris spread?

G. salaris is most commonly spread when people release infected fish into uncontaminated waters. As noted above, the parasite can be carried by many fish other than rainbow trout. The disease cannot be seen with the naked eye, so it is vital that no living fish are moved from one waterway or river to another.

G. salaris can also be spread if an infected fish escapes from a fish farm in fresh or brackish water in the vicinity of salmon watercourses.

G. salaris can survive for several days separated from a host, so it can be spread by fishing equipment that has been used in infected water. This can only happen if the equipment is still wet or damp when it is moved to another watercourse, but with today's rapid journey times it doesn't take long to get from one river system to another.

G. salaris could also be spread if a fish caught in one watercourse is cleaned and gutted in another watercourse.

What happens if Gyrodactylus salaris does get into our salmon rivers?

So far there is only one known way of destroying G. salaris after it has infected a river:

this is to destroy its entire stock of fish.

Extract taken from www.mmm.fi/el/julk/gyroen.html - Norwegian Ministry of Forestry and Agriculture.

C. Salmon Gill Disease

Scientists are a step closer to understanding the organism responsible for the major disease affecting Tasmanian Atlantic salmon.

Current treatment of Amoebic Gill Disease – which slows the growth of salmon by attacking the gills – costs the sea-farmed salmon industry over \$15m a year.

Affected fish are safe for human consumption. However infected fish lose condition and the cost of treating the disease is preventing the industry from reaching its full growth potential.

Currently the disease is managed by bathing the fish in freshwater - an environmentally friendly but expensive and time-consuming process.

The future of the Tasmanian salmon industry is very dependent on understanding this disease, says Dr Elliott, CSIRO. While the disease is also found overseas, the Tasmanian outbreaks have become more frequent and more severe.

"The industry could increase its production if it wasn't having to incur the large cost of treating Amoebic Gill Disease," says Dr Wadley, TSGA. "A large part of the expense comes from accessing the large volumes of freshwater needed to treat the salmon."

"By identifying 'the enemy' we can now move toward managing and treating the disease more effectively", she says.

"Currently the towing of cages from farms to freshwater supplies where they are filled and taken back to the farms is simply unavoidable. This means that salmon farms need to be close to freshwater, ruling out options of expanding offshore."

"In short, the disease is tying us to freshwater and capping production at the current level."

Extract *taken* *from*
www.marine.csiro.au/PressReleasesfolder/01releases/22Mar01.html - CSIRO Marine
Media Release.

SECTION 2

OBSERVATIONAL SIGNS OF DISEASE AND IDENTIFYING TRENDS

What is disease?

A disease can be described as a departure from the normal state of health, and can be classed as either **infectious** or **non-infectious**.

Infectious diseases are caused by viruses, bacteria, parasites and fungi, whilst

Non-infectious diseases can be caused by adverse environmental factors such as water quality or the presence of toxins/pollution.

Diseases are also described as **exotic** or **enzootic**.

Exotic diseases are those that have not been seen in the Australian environment, whilst

Enzootic diseases are those that have a permanent home (or are currently present in) the Australian environment, these diseases can be native to Australia or introduced in the past and are now established.

An AAH emergency does not have to be related to a virus or parasite etc - it can occur due to adverse environmental conditions or other factors such as algal blooms and pollution.

Algal blooms can be incredibly dangerous for a fish farm.

Excessive algae growths or blooms can cause serious water quality problems such as:

- foul tastes and odours;
- blockages in pump valves and filters.

In addition, dead or decomposing algae uses oxygen in the water body. Zero or low oxygen conditions can contribute to fish kills and the death of other aquatic animals.

Some algae have a direct toxic effect on fish e.g. heterosigma. Other algae, particularly blue-green algae, produce potent toxins and can create health hazards for people and animals.

Pollution can also be the cause of an AAH emergency.

Make note of the surrounding industries and be vigilant regarding pollution outlets, spillages, ballast water discharge or run off into the aquatic environment.

We are all too familiar with the events of Wallace Lakes.....

Everyone should be aware as to what a healthy fish looks like - so any deviation from this could be a sign of a potential outbreak.

Common signs of disease outbreaks include:

- **Mass mortality**
- **Loss of condition**
- **Reduced or no appetite**
- **Abnormal swimming behaviour – sluggishness or flashing (this is when the finfish 'flashes' its lighter underbelly)**
- **Abnormal characteristic behaviour – gasping at surface, slow closing shellfish**
- **Skin ulcers**
- **Presence of parasites and/or fungus**
- **Skin colour changes – dark/stress, white spot/crustaceans – fish can go light or dark depending on the disease – in general any change of colour may indicate a problem**
- **Gill changes – increased mucus, pale patches, brown, damaged.**

IT IS IMPERATIVE THAT ALL LEVELS OF STAFF ARE FAMILIAR WITH THE BASIC OBSERVATIONS OF DISEASE AND HOW AND WHEN TO RESPOND.

Fast and accurate identification is crucial in the containment of an AAH emergency, so

KEEP YOUR EYES OPEN AT ALL TIMES and

'THINK THE WORST – FIRST'

Identifying trends:

A simple log or monitoring handbook is a good resource tool that can be used by all staff on the farm. It need not be complex but can be a memory jogger for those responsible for managing the fish.

As part of the general management of your farm you should already have a monitoring and written reporting procedure in place. **This written documentation of the health of the fish and the environment in which it lives is vital for quick identification of what could become a major emergency.**

Make notes of reoccurring incidences – they may be more serious or frequent than you think.

A simple tip is to have a health report sheet/book both at management and farmhand level. Quite often it is the general farmhand who witnesses any changes to the fish.

Recognising trends not only assists with identification of disease but also enables prior preparation to situations that could evolve to emergency status.

As an example:

Sydney oyster farmers thought that cold weather was causing mortalities to their oysters each year when in fact it was the presence of a protozoan parasite, *Mikrocytos roughleyi*, commonly known as Winter Mortality Disease.

SECTION 3

POINTS OF CONTACT IN THE EVENT OF AN EMERGENCY

The following numbers should be placed where all employees and management can clearly see them or know where to reference them easily.

FARM MANAGER – Out of hours contact phone #'s

FARM SUPERVISOR – Out of hours contact phone #'s

FISHWATCH – 1800 065 522
(24hr emergency hotline)

PIRSA Aquatic Health Unit – 08 8226 0314

LOCAL COUNCIL OFFICE –

SURROUNDING GROWERS – List of #'s for surrounding growers, including out of hours #'s.

SECTION 4

BASIC CONTINGENCY PLANNING & STANDARD OPERATING PROCEDURES IN THE EVENT OF AN AAH EMERGENCY

There are 4 Steps:-

1. **Identify** – symptoms or signs are observed
2. **Alert** – an aquatic animal health incident is recognised and reported.
3. **Response** – short term management strategies are employed until the disease is confirmed.
4. **Action** – dependant on the level of seriousness of the identified disease. (Such actions as quarantine, treatment of fish, water and infrastructure, restrict movement, monitor, close access, destruction of fish)

Step 1. IDENTIFY

Ask yourself the following series of questions:

What do you see?

What is not 'normal' for your species?

What may have caused this?

Has there been a change in environmental conditions/water quality?

Has there been any water contamination/pollution in the area?

Could the fish feed have gone off or be contaminated?

Have the fish recently been stressed in any way?

The more questions you ask yourself and the more thorough your own trouble-shooting the quicker the identification process is likely to be.

GENERAL BASIC SIGNS OF ABNORMAL AQUATIC ANIMAL HEALTH:

- Mass mortality of stock
- Loss of stock condition
- ***Reduced or no appetite***
- Abnormal swimming behaviour
- Abnormal characteristic behaviour
- Skin ulcers/fungus/presence of parasites
- Skin and/or gill colour changes
- ANYTHING OUT OF THE ORDINARY – be it big or small!

Step 2. ALERT OTHERS

Who to contact in the event of an AAH Emergency:

- Farm Manager
- Farm Supervisor
- Fishwatch - **1800 065 522** (24 hr emergency hotline)
- PIRSA Aquatic Health Unit - **08 8226 0314**
- Local council office
- Surrounding local growers – **communicate**, others may be experiencing similar problems but have not yet identified them.

Farmers should also contact their local vet or vets and ask if they have experience with aquaculture medicine and if not, could they suggest anyone who does. If there is a vet who has experience, their name should be added to the contact list.

Remember – If you fail to alert others of a possible disease on your farm, it may have the potential to spread to the whole industry with potentially large consequences.

Step 3. RESPONSE

(A) Short term management strategies – how to react and help for quick identification

- Isolation – RESTRICT CONTAMINATION
- Liaise with AAH trained personnel (PIRSA)
- Temporary closure to the sales markets
- No movement of stock to other areas
- Continual monitoring/assessment of the stock and the environment
- Sample/evidence collection to assist with identification – obtain diagnostic information about affected samples.

(B) Restrict contamination:

Isolation is the key to initial response strategies.

Extra care **MUST** be taken to ensure that the level of contamination is minimal.

Be very aware when transporting your fish around your site that you are also possibly transporting a disease. Be very aware also of the surrounding environment and other farms within the area.

Be very thorough with cleanliness – clean and sanitize all utensils and equipment used such as the buckets, boat etc and all clothing such as boots/overalls/gloves.

(C) Communication:

You **MUST** communicate and share all information in the event of an AAH emergency.

Not only must you inform the appropriate authorities, you must liaise and speak with surrounding growers.

A good policy to adopt in these situations is to warn your neighbors “don’t come near us and we will stay away from you”

Good communication assists with fast diagnosis and treatment and containment**(D) Sampling:**

When there is an obvious/serious stock disease problem and you are some distance from a phone, it is preferable to take samples on the spot.

Quick action is usually required to diagnose and control an aquatic animal health emergency. Some cases can be solved over the phone by discussion alone but for others samples will need to be supplied.

Should samples be required for laboratory diagnosis, the methods of sampling and shipment should be sought from the appropriate laboratory.

General sampling techniques include:

- **Finfish** – 3 live affected specimens in a plastic bag filled with 2/3 water and 1/3 air or oxygen delivered to the laboratory within 12 hours. It is desirable that the plastic bag with animals is kept in the dark and cool (not frozen)
- **Shellfish and crustaceans** – 3 live specimens in a foam esky cooled with ice bricks (but not in direct contact) and covered with moist foam delivered to the laboratory within 12 hours.
- **Water** – samples of the water can be collected in a clean, glass or plastic container (1 – 2 litre) filled to the top. The container should be kept cold (but not frozen) and in the dark (ie an esky) and generally arrive at the analytical laboratory within 24 hours (sooner rather than later)
- **Dead Samples** - If live samples are not available send 3 affected specimens in an esky adjacent to ice or ice bricks (but not frozen) or in sealed plastic bags on ice, delivered to the laboratory within 24 hours.

Don't send rotting or long dead samples, as they are of little to no use – the fresher the samples the better.

These techniques describe the best ways to send samples to the laboratory. A diagnosis should always be accompanied by observations from the farm. It is vital that trained fish health staff visit the farm, just as important as sending material to the laboratory.

While the above methods are satisfactory the BEST way to send samples for fast and effective diagnosis is not to send the whole specimen but to take various bacterial swabs and organ dissections.

Farms should have a basic AAH emergency sampling Kit.

This simple kit should consist of:

- Scalpels
- Formalin
- Bacterial swabs

This should be kept on hand in the event of an AAH emergency. The main benefit of these samples is they can be taken and sent through the post – and arrive at the laboratory fresh and ready for immediate diagnosis.

Step 4. ACTION

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This is dependant on the seriousness of the identified disease and is generally advised by the appropriate AAH authorities. Before action is taken, a diagnosis must be made. Only a qualified veterinarian can make a formal diagnosis or prescribe treatment.

Some likely action may include but is not limited to:

- **No action** – situation all clear
- **Restricted sale** and/or movement of stock
- **Treatment** (use of appropriate chemicals under veterinarian guidance)
- **Destruction** of infected stock

Remember - ANY treatment will require the appropriate approval by the PIRSA Aquatic Animal Health Unit and a prescription from a registered veterinarian. That also includes the use of any chemicals.

SECTION 5

TRANSLOCATION

What is translocation?

Translocation refers to the **movement** of any material – including fish and aquatic plants – that exist or grow in water.

Translocations are usually deliberate actions but can occur by accident and the material concerned can be alive or dead.

An example of **deliberate translocation** includes the supply/import of various fish species for aquaculture purposes. For example the importation of oyster seed into South Australia from a Tasmanian hatchery or the supply of Yellowtail kingfish fingerlings or broodstock to other farms within the state.

An example of **accidental translocation** includes the introduction of aquatic material via ballast water, or the accidental movement of aquatic material associated with food or other products.

EVERY MOVEMENT OF AQUATIC MATERIAL WHETHER DELIBERATE OR ACCIDENTAL HAS ITS OWN ASSOCIATED LEVEL OF RISK.

Whenever translocating a new species or animals from a new location to a farm, make sure you contact PIRSA Aquaculture (08 8226 0314) – there are translocation procedures that have to be followed and specific conditions regarding the movement of some species.

Extra careful consideration needs to be taken if the species being translocated is not native to that area. The introduction of the European carp into Australian waterways speaks for itself, as does the effect the Pacific Oyster had on the native Sydney rock oyster species.

THE OCEAN HAS NO FENCES

IT IS IMPERATIVE TO THINK BEFORE SPECIES ARE MOVED AROUND – YOU COULD BE SPREADING DISEASE.

SECTION 6

GOVERNMENT LEGISLATION AND REGULATION

Attached is an extract taken from AQUAVETPLAN – **AQUAVETPLAN Enterprise Manual**

Summary of current legislation with relevance to aquatic animal diseases

Summary of current legislation with relevance to aquatic animal diseases:

Australian Capital Territory

The Stock Act 1993
 The Animal Diseases Act 1993
 The Nature Conservation Act 1980
 The Fishing Act 1967

New South Wales

The Exotic Diseases of Animals Act 1991
 The Stock Diseases Act 1923
 The Fisheries Management Act 1994
 The Fisheries Management Act (Aquaculture) Regulations 1995

Northern Territory

The Stock Diseases Act 1954
 The Fisheries Act 1995
 Queensland The Fisheries Act 1994
 The Fisheries Regulations 1995

South Australia

The Livestock Act 1997
 The Fisheries Act 1982
 The Exotic Fish, Fish Farming and Fish Disease Regulations 2000
 Aquaculture Act 2001 (carries power to make notification of disease incidences on your farm an enforceable licence condition)

Tasmania

The Animal Health Act 1995
 Inland Fisheries Act 1995

Victoria

The Livestock Disease Control Act 1994
 Fisheries Regulations 1998

Western Australia

Pearling Act 1990
 The Exotic Disease of Animals Act 1993
 The Stock Diseases Regulations Act 1996
 Enzootic Diseases Amendment Regulations 1999

Commonwealth and International

The Commonwealth Fisheries Management Act, 1991, London Convention, Black marlin Code for Commercial Fishers and the Recreational Fisheries Code of Practice,

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The Fisheries Act, 1975, Off Shore petroleum and Minerals Exploration Acts, State Fisheries Acts and Legislation, UN Agreement on Straddling and Migratory Fish Stocks, Quarantine Act, 1908 and Ballast Water Regulations, Waste processing discharges from food processing and industrial wastes, MARPOL.

Section 7

REFERENCES

BOOKS:

- AQUAVETPLAN – Enterprise Manual
This can be down loaded from www.dpie.gov.au/
- Herfort, A. and Rawlin, G.T. (1999) *Australian Aquatic Animal Disease Identification Field Guide*. Agriculture, Fisheries and Forestry – Australia, Canberra.

WEBSITES:

- www.oie.int - Office International de Epizooties
- www.pac.dfo.ca/sealane/pacific.htm - Fisheries and Oceans Canada
- www.mmm.fi/el/julk/gyroen.html - Norwegian Ministry of Forestry and Agriculture.
- www.marine.csiro.au/PressReleasesfolder/01releases/22Mar01.html - CSIRO Marine
- PIRSA - www.pir.sa.gov.au/ - follow the links for Aquaculture
- Department of Fisheries WA - www.fish.wa.gov.au/
- Agriculture, Fisheries and Forestry Australia – www.affa.gov.au
Select Fisheries and Aquaculture then Aquatic Animal Health

There is a multitude of information relating to AAH available on the web.

Some key search words include:

- Aquatic Diseases
- Aquatic Animal Health
- Fish Health/Fish diseases
- Species name ie) Yellowtail Kingfish
- Disease name ie) White spot, winter mortality

APPENDIX 1

THE OIE – who are they?

The OIE (Office International des Epizooties) is an intergovernmental organisation created by the International Agreement of 25 January 1924 and currently totals 162 member countries.

Each Member Country undertakes to report the animal diseases that it detects on its territory. The OIE then disseminates the information to other countries, which can take the necessary preventive action.

Therefore the OIE acts as the international body for all AAH reporting. In the event of a serious outbreak or AAH situation the OIE are notified by the appropriate AHH unit. One reason for this is so countries trading between each other can access information regarding diseases within that country.

Our Official delegate in Australia is:

Dr J. Gardner Murray
President of the OIE Regional Commission for Asia, the Far East and Oceania
Chief Veterinary Officer/Executive Manager
Product Integrity, Animal and Plant Health
Agriculture, Fisheries and Forestry Australia (AFFA)
GPO BOX 858
Canberra ACT 2601

THE OIE STATUS OF AQUATIC ANIMAL HEALTH IN AUSTRALIA

Australia is free of most of the diseases notifiable to the world organisation (OIE) for animal health as well as many of the diseases currently listed as other significant diseases.

Diseases notifiable to the OIE appear on a list of transmissible diseases that are considered to be of socioeconomic and/or public health importance within countries and are significant in the international trade of aquatic animals and aquatic animal products.

Other OIE significant diseases are diseases that are of current or potential international significance in aquaculture but that have not been included in the list of diseases notifiable to the OIE.

Other significant diseases are considered less important than the notifiable diseases, have a limited geographical distribution, or, conversely, are too widespread for notification to be meaningful.

The good news is that currently Australia is free of most of the diseases notifiable to the OIE as well as many of the diseases currently listed as other significant diseases.

Remember that non-notifiable diseases and new diseases can cause serious problems on farms.

The current status of each OIE notifiable and other disease in Australia is shown in Table 13.

Table 13 Status of OIE-listed diseases of aquatic animals in Australia in 2001		
<u>Disease/agent</u>	<u>OIE listing</u>	<u>Status in Australia in 2001</u>
Finfish Diseases		
Epizootic haematopoietic necrosis	Notifiable	Locally present
Infectious haematopoietic necrosis	Notifiable	Exotic
<i>Oncorhynchus masou</i> virus disease	Notifiable	Exotic
Spring viraemia of carp	Notifiable	Exotic
Viral haemorrhagic septicaemia	Notifiable	Exotic
Channel catfish virus disease	Other significant	Exotic
Viral encephalopathy and retinopathy	Other significant	Locally present

Infectious pancreatic necrosis	Other significant	Exotic
Infectious salmon anaemia	Other significant	Exotic
Epizootic ulcerative syndrome (<i>Aphanomyces invadans</i>)	Other significant	Locally present
Bacterial kidney disease (<i>Renibacterium salmoninarum</i>)	Other significant	Exotic
Enteric septicaemia of catfish (<i>Edwardsiella ictaluri</i>)	Other significant	First, isolated case
Piscirickettsiosis (<i>Piscirickettsia salmonis</i>)	Other significant	Exotic
Gyrodactylosis (<i>Gyrodactylus salaris</i>)	Other significant	Exotic
Red Sea bream iridoviral disease	Other significant	No information available
White sturgeon iridoviral disease	Other significant	No information available
Mollusc diseases		
Bonamiosis		
<i>B. ostreae</i>	Notifiable	Exotic
<i>Bonamia</i> spp	Notifiable	Not reported in 2001 but local occurrence in previous years
Haplosporidiosis		
<i>Haplosporidium costale</i>	Notifiable	Exotic
<i>H. nelsoni</i>	Notifiable	Exotic
Marteiliosis (QX disease)		
<i>Marteilia refringens</i>	Notifiable	Exotic
<i>M. sydneyi</i>	Notifiable	Locally present
Mikrocytosis		

<i>Mikrocytos mackini</i>	Notifiable	Exotic
<i>M. roughleyi</i>	Notifiable	Not reported in 2001 but local occurrence in previous years
Perkinsosis		
<i>Perkinsus marinus</i>	Notifiable	Exotic
<i>P. olsenii</i>	Notifiable	Locally present
Crustacean diseases		
Yellowhead disease	Notifiable	Exotic
White spot disease	Notifiable	Exotic
Taura syndrome	Notifiable	Exotic
Baculoviral midgut gland necrosis	Other significant	Exotic
Nuclear polyhedrosis baculoviroses		
<i>Baculovirus penaei</i>	Other significant	Exotic
<i>Penaeus monodon</i> -type baculovirus	Other significant	Locally present
Infectious hypodermal and haematopoietic necrosis	Other significant	Exotic
Crayfish plague	Other significant	Exotic
Spawner mortality syndrome (midcrop mortality syndrome)	Other significant	No information available

Table 14 shows further information about the occurrence of listed diseases in 2001.

Table 14 Occurrence of OIE-listed diseases of aquatic animals in Australia, 2001	
Disease/agent	Occurrence
Finfish diseases	
Epizootic	Epizootic haematopoietic necrosis (EHN) virus was isolated

haematopoietic necrosis	<p>from one pool of five clinically healthy redfin perch (<i>Perca fluviatilis</i>) in Victoria in November 2001 (active surveillance). EHN was not reported in 2001 from New South Wales but was last reported in 2000. EHN was not reported during 2001 but is known to have occurred in South Australia (1992). EHN has never been reported in the Northern Territory, Queensland, Tasmania or Western Australia (targeted active surveillance in Tasmania and Western Australia, passive surveillance in New South Wales, Northern Territory, Queensland and South Australia). Annual occurrence of the disease in the Australian Capital Territory but no laboratory confirmation.</p>
Viral encephalopathy and retinopathy	<p>Viral encephalopathy and retinopathy (VER) was reported from the Northern Territory in May, August and September 2001 (targeted active surveillance) and from Queensland in June and December (histological diagnosis). VER was not reported from Tasmania during this period (targeted active surveillance) but is known to have occurred in 2000. Not reported in South Australia since an isolated outbreak in July 1998 despite active surveillance. Never reported from New South Wales, Victoria or Western Australia despite passive surveillance. No information available in the Australian Capital Territory.</p>
Epizootic ulcerative syndrome	<p>Reported from New South Wales from March to June 2001 and again in December 2001, from the Northern Territory in March, May, August and September 2001, from Queensland in February, April and June to September 2001, from Victoria in December 2001 and from Western Australia in January 2001 (based on histological diagnoses). Never reported in South Australia or Tasmania despite passive surveillance. No information available in the Australian Capital Territory.</p>

Enteric septicaemia of catfish	<i>Edwardsiella ictaluri</i> was isolated in October 2001 in Tasmania as the cause of ongoing deaths in zebra-fish (<i>Brachydanio rerio</i>) held in a contained research system with a PC-2 containment classification. The bacterium has never before been isolated from post-quarantine fish within Australia; nor have there been published reports of its occurrence in this fish species worldwide.
Mollusc diseases	
Bonamiosis	
<i>Bonamia</i> spp	<i>Bonamia</i> species were not reported in 2001 from Western Australia but are regarded as enzootic in that State. In Tasmania and Victoria, not reported in 2001 but known to have occurred in 1999 in Tasmania and 1993 in Victoria. Never reported in New South Wales, Northern Territory, Queensland or South Australia (passive surveillance). The Australian Capital Territory has no marine water responsibility.
<i>B. ostreae</i>	Never reported (passive surveillance).
Marteiliosis (QX disease)	
<i>Marteilia refringens</i>	Never reported (active surveillance in Tasmania; passive surveillance elsewhere).
<i>M. sydneyi</i>	Reported from New South Wales in May 2001 (active surveillance). Considered enzootic in Queensland, but no diagnostic submissions. Not reported during 2001 from Western Australia (passive surveillance) but known to have occurred in 1994. Never reported in the Northern Territory, South Australia, Tasmania or Victoria (active surveillance in Tasmania; passive surveillance elsewhere). The Australian Capital Territory has no marine water responsibility.
Mikrocytosis	
<i>Mikrocytos mackini</i>	Never reported (active surveillance in Tasmania; passive surveillance elsewhere).

<i>M. roughleyi</i>	Considered enzootic in Queensland, but no diagnostic submissions. Not reported during 2001 (passive surveillance) but known to have occurred in New South Wales and Western Australia in 1996. Never reported in the Northern Territory, South Australia, Tasmania or Victoria (active surveillance in Tasmania; passive surveillance elsewhere. The Australian Capital Territory has no marine water responsibility.
Perkinsosis	
<i>Perkinsus marinus</i>	Never reported (active surveillance in Tasmania; passive surveillance elsewhere).
<i>P. olsenii</i>	Reported from New South Wales and South Australia in October, November and December 2001 (targeted active surveillance). Not reported during 2001 (passive surveillance) but known to have occurred in Western Australia in 1995. Never reported in Tasmania, the Northern Territory, Queensland or Victoria (active surveillance in Tasmania; passive surveillance elsewhere). The Australian Capital Territory has no marine water responsibility.

Table 15 shows other diseases not listed by the OIE.

Table 15 Status of non-OIE listed diseases of aquatic animals in Australia, 2001	
Disease/agent	Status in 2001
Finfish diseases	
Furunculosis (<i>Aeromonas salmonicida salmonicida</i>)	Exotic
Goldfish ulcer disease (<i>Aeromonas salmonicida</i> atypical strains)	Not reported in 2001 but local occurrence in previous years
Whirling disease (<i>Myxobolus cerebralis</i>)	Exotic
Enteric redmouth disease (<i>Yersinia rucker</i> - Hagerman strain)	Exotic
Yersiniosis (<i>Yersinia ruckeri</i> - strains other than Hagerman)	Reported in 2001 in Tasmania
Crustacean diseases	
Necrotising hepatopancreatitis	Exotic
Mollusc diseases	
Iridoviroses	Exotic

APPENDIX 2

OTHER USEFUL INFORMATION FROM THE AQUAVETPLAN

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Management of aquatic animal disease emergencies

AQUAVETPLAN Enterprise Manual

Section A: Overview, A.5 Management of aquatic animal disease emergencies

Reporting

It is likely that, in most States/Territories, fish kills are reported initially by either farmers or members of the general public. These people would inform research institutes, private consultants, private veterinarians, Fisheries/Field Officers or the State Veterinary Diagnostic Laboratory directly.

No matter what the avenue of reporting, it is imperative that the State Veterinary Laboratory, or equivalent, is informed as soon as possible so that appropriate action is initiated. It is important that the State system is alerted, as the State government will be responsible for coordinating the response.

Coordination of the incident

Management of the incident is coordinated through State authorities. It is usually through a single State veterinary diagnostic laboratory (or equivalent) led by the State Chief Veterinary Officer (CVO) and/or Director of Fisheries. It is the State authority (Agriculture and/or Fisheries departments) which has the linkages to other emergency agencies if needed.

Lines of communication during the incident

The State CVO and/or the Director of Fisheries or delegates are the conduit for information within the State and to other States/Territories and Commonwealth agencies.

If the disease is of national importance the State CVO and/or Director of Fisheries will activate the Consultative Committee on Emergency Animal Diseases (CCEAD). This body is the communication network of the Commonwealth, CVOs, and in the case of aquatic animal disease emergencies, the Fisheries Directors of each State/Territory.

In the face of a disease of national or international significance, the CCEAD is the central authority for communications both within Australia and to international agencies. The Commonwealth Chief Veterinary Officer on behalf of Australia will carry out international communication.

The Office of the Commonwealth CVO is responsible for international reporting to the OIE.

A team approach

A task force or disease emergency management team may be formed. This team would include personnel with expertise relevant to the specific outbreak and so varies depending on the emergency. Industry representatives should play a key role in this taskforce.

The assistance of other agencies may be required to cope with issues such as public health, environmental protection and field operations. Examples of this are State Emergency Services, Police, Environmental Protection Agency and Health Department.

Liaison with these services will be largely at the task force level, although linkages at a higher level will often be forged by the CCEAD to secure cooperation.

Teamwork between State departments, Commonwealth agencies and industry representatives is essential to use effectively the limited resources available for management of aquatic animal disease emergencies.

Information management

Control of information and communication is important. Timely release of accurate information is the key to good information management. The aim is to keep relevant parties informed, reduce the spread of inaccurate information by rumor, and protect any appropriate trade (domestic or international) position.

AQUAVETPLAN Enterprise Manual

*Appendices, Appendix 5 of the Manual: **Aquatic animal disease emergency contact numbers in Australia***

(see table over page)



Appendices, Appendix 5: Aquatic animal disease emergency contact numbers in Australia

Appendix 5: Aquatic animal disease emergency contact numbers in Australia

Organisation	Position	Telephone
CSIRO AAHL Fish Diseases	Fish Disease Specialists	03 5227 5118
National Offices of Animal and Plant Health, AFFA, Canberra	Commonwealth CVO	02 6272 4328
DPIF, Tasmania	Fish Pathologist	03 6336 5389
	CVO	03 6336 5289
DNRE, Victoria	Fish Pathologist	03 9217 4200
	CVO	03 9217 4247
NSW Fisheries	Fish Pathologist	02 6626 1261
	Fisheries Manager	02 4980 4919
NSW Agriculture	CVO	02 6391 3717
QDPI	Fish Pathologist	07 4722 2610
	Fish Pathologist	07 3362 9525
	Fisheries Manager	07 3224 2184
	CVO	07 3239 3546
DPIF, NT	Fish Pathologist	08 8989

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		2211
	Fisheries Manager	08 8999 4321
	CVO	08 8999 2131
Fisheries WA	Fish Pathologist	08 9368 3649
Agriculture WA	CVO	08 9368 3535
PIRSA, (South Australia)	CVO	08 8207 7970
VPS, Adelaide	Fish Pathologist	08 8372 3703
PIRSA, (South Australia)	Fish Health Manager	08 8226 0314
Dept of Parks and Conservation, ACT	CVO	02 6207 2357
Version 1, November 2000 Appendices Page 23		

AQUAVETPLAN Enterprise Manual

Appendices, Appendix 6 of the Manual: Drug and chemical use in aquaculture

Drug and chemical use in aquaculture

In considering therapy as a control measure for infectious diseases in aquatic animals a number of factors need to be examined. Firstly, for viral diseases, there are no current treatments available. Chemotherapy is not an option and the use of vaccination is at the experimental stages only. For serious viral diseases, especially OIE listed diseases, slaughter and disinfection – a major exercise - needs to be considered.

Vaccination against bacterial diseases is used as a preventative measure, for example, DPIWE Tasmania produces a killed bacterin vaccine against vibriosis which is used by the Tasmanian salmonid industry. Other vaccines for prophylaxis against certain bacterial diseases, e.g. furunculosis in salmon, are used overseas.

There are many treatments for bacterial and parasitic diseases of fish. In deciding whether treatment is the preferred option, selecting the most appropriate treatment requires knowledge not only of efficacy but also ease of application, human safety, target animal safety, regulatory aspects, toxicity and side effects of chemotherapeutants, potential problems of resistance and tissue residues, environmental impact of chemical use and costs.

Drugs not registered for use in aquatic animals in Australia can be given emergency use status with the agreement of the Chief Veterinary Officer of the State in question. Drugs can be used off label by a veterinarian if the chemicals are registered for use in another species.

However, liability aspects of off-label usage apply. When using chemicals in the environment a close cooperation with the local Environmental Protection Agency will be needed.

None of these issues can be adequately addressed in this manual. Your attention is drawn to these issues and a number of relevant references are listed below. These references are available in emergency at short notice from CSIRO AAHL, Geelong and the Office of the Chief Veterinary Officer, AFFA, Canberra. Included is the latest report of the National Taskforce on Aquaculture Drugs and Chemicals which was established in 1995 to examine the approval process for drug and chemical use in aquaculture.

'Think the Worst – First'

(AQUATIC ANIMAL HEALTH EMERGENCY PROCEDURE)

IDENTIFY

GENERAL SIGNS OF ABNORMAL AQUATIC ANIMAL HEALTH – LOOK FOR:

- Mass mortality of stock
- Loss of stock condition
- **Reduced or no appetite**
- Abnormal swimming or characteristic behavior
- Skin ulcers/fungus/presence of parasites
- Skin and/or gill colour changes
- ANYTHING OUT OF THE ORDINARY – be it big or small!

ALERT

Who to contact in the event of an AAH Emergency

- Farm Manager
- Fishwatch - **1800 065 522** (24 hr emergency hotline)
- PIRSA Aquatic Health Unit - **08 8226 0314**
- Local council
- Surrounding local growers

RESPONSE

Interim management strategies

- Restrict contamination
- Communication with surrounding growers and AAH trained personnel
- Temporary closure to the sales market
- Continual monitoring/assessment of the stock and the surrounds
- Sample/evidence collection to assist with identification

ACTION

Dependant on identified disease – to be advised by AAH authorities

- No action – situation all clear
- Restricted sale and/or movement of stock
- Treatment (antibiotics/water baths)
- Destruction of infected stock

Appendix 6:

Project Reports

MILESTONE PROGRESS REPORT 1



FISHERIES
RESEARCH &
DEVELOPMENT
CORPORATION

FRDC PROJECT NUMBER: 2002/664

PROJECT TITLE: Aquatic Animal Health Emergency Management Training and Incident Simulation

PRINCIPAL INVESTIGATOR: Melanie Ryan (Special Projects Officer – Seafood Training SA)

OVERALL PROJECT PROGRESS:

Project is on target, first milestone outcomes achieved. There are 2 objectives regarding this project:

- 1) The identification of strategies to effectively manage aquatic animal health (AAH) emergencies;
- 2) The provision of responsive emergency training workshops suitable for both employers and employees of the aquaculture industry.

The idea behind the 2 – 2.5 hour duration workshops is a simplistic approach, a workshop educating industry personnel on what to look out for, basic contingency management and points of contact to remember in the instance of an AAH emergency.

The research phase of the project involved detailed discussions with Fish Health Officers, Industry Associations and peak bodies such as the SA Aquaculture Council. Whilst the nature of the issue was generally well understood, the actual form of the workshops and the design of practical guides and tools was a process that involved a wide range of discussions. The need for a balance between the biological perspective and operator competency was emphasised by industry representatives. This was seen as especially important as the person who is often the first to witness disease events is the farm hand, often working alone or unsupervised, particularly on weekends.

Information provided from this phase clearly supported a simplistic workshop approach where growers could take home practical information on who, what, how and when these events occur. The research phase underlined the general lack of knowledge on some of the more common aquatic diseases and what to do when a disease is first witnessed. There was strong support for tools that helped operators identify disease and know how and who to communicate with.

It was found that most operators lacked standard operating procedures for aquatic health emergencies and in this regard, the Aquavetplan was seen as especially useful.

The need to meet local industry needs was emphasised by the industry and supported the concept of offering five workshops across the State. Distances alone would mean that some regions would simply not be represented if this approach was not adopted.

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Some preliminary work was undertaken on material design and content just to gather information ready for the handouts/kits. The Steering Committee meeting signed off on the approach and structure of the workshops and the development of workshop material will now be completed for these workshops.

The first Steering Committee meeting was convened when the direction and structure was largely firmed. The Committee needed to review the direction proposed and discuss how the material should be developed.

The meeting was held on 4 October and confirmed the structure and content of the workshops.

(report on the overall progress of the project and how that aligns with achieving project objectives as specified in the agreement.)

REPEAT THE FOLLOWING THREE SECTIONS FOR EACH MILESTONE IN THE PERIOD:

ORIGINAL MILESTONE DATE AND TITLE:

23 Oct 2002 – Steering Committee formed/First committee meeting

REVISED MILESTONE DATE AND TITLE:

(only if previously arranged)

PROGRESS AGAINST MILESTONE:

The Steering Committee has been formed consisting of: Melanie Ryan (Principal Investigator), Mark Cody (Seafood Training), Doug Parker (Aust. Fisheries Academy), Marty Deveney (PIRSA – Fish Health Unit) and Steve Clarke (SARDI).

All were in attendance, except Steve Clarke who sent his apologies.

The first committee meeting was set to establish the basic structure for the Emergency Training Workshops, and this was achieved.

Meeting outcomes included:

1. Workshops are to be simplistic “FYI” structure consisting of 5 basic elements (see below)
 - Basic review of AAH at the local/state/national level – who looks after what/escalations to each.
 - Definitions of disease (host/pathogen/environment/exotic/endemic) and basic observations of disease/trends
 - Contingency planning/developing standard operating procedures (Aquavetplan)
 - Points of contact in the event of an emergency (local/state/national)
 - Translocation/quarantine

The strategies chosen came out of feedback from industry associations and individual aquaculture operators who expressed a preference for a who/what/how

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approach focussing on the identification of disease and how to deal with emergencies in a practical way.

In the case of providing support to individual operators it was recognised that each operation needed to have practical identification “charts” or simple unambiguous information to allow operators to correctly identify diseases and quickly deal with the emergency.

2. It was agreed that the Workshops should be 2 – 2.5 hours in duration at times which suit the industry. Preliminary information suggests that these will be early evening meetings to encourage as much participation as possible.
3. There will be 5 workshops held, three in the Eyre region – Ceduna, Port Lincoln and Cowell, one in Adelaide and one in Robe. The aim is to get as many responsible people to each workshop. This will be achieved by both Association and direct grower contact. The South Australian Aquaculture Council will also be used to disseminate information on the workshops.
4. Information for the workshops will be developed/refined over the next four weeks in line with agreed elements and the workshops programmed for the last week of November 2002. These workshops will focus on generic issues but also introduce common diseases for major aquaculture sectors. Given the importance of the issues, a shock tactic approach will be used in the workshops to get participants to commit to the development of suitable operational procedures. A participant kit will be developed for all participants to take home and use in the shed/office. A participant evaluation sheet will be designed for the workshops.
5. The information to be presented and distributed will be signed off by the Steering Committee prior to conducting the first workshop. Any necessary refinements will be incorporated for the second and subsequent workshops. Committee Members will contribute suitable information to support the development of the workshop material.

(report on the research undertaken to achieve each milestone since the last report. Reports should contain enough detail to establish the objectives and outcomes of each milestone, as well as how it was achieved. Relevant tables and figures can also be included)

SPECIAL CONDITIONS

N/A

INTELLECTUAL PROPERTY ISSUES ARISING:

N/A

CONTACT WITH BENEFICIARIES:

Regular contact was made through phone and email between PIRSA Fish Health Unit, SARDI and Seafood Training and the identification of primary and secondary points of contact within South Australia.

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PROGRESS AGAINST COMMUNICATION & EXTENSION PLAN:

Primary notification sent to relevant industry associations (outlined in the project application) to inform industry members of the Emergency Training Workshops. Tentative dates for the workshops are awaiting industry approval but are expected to occur in the last week of November 2002.

VARIATIONS TO PROJECT:

N/A

Note:

*Projects with suffix \leq 2000:
These progress reports should be submitted in accordance with the milestone schedule.*

Projects with suffix \geq 2001:

These progress reports must be submitted in accordance with the agreed schedule in Part 2 of the Project Agreement, and must be accompanied by a tax invoice for the agreed amount.

MILESTONE PROGRESS REPORT 2



FRDC PROJECT NUMBER: 2002/664

PROJECT TITLE: Aquatic Animal Health Emergency Management Training and Incident Simulation

PRINCIPAL INVESTIGATOR: Melanie Ryan (Special Projects Officer – Seafood Training SA)

OVERALL PROJECT PROGRESS:

The project is on target but a little behind schedule, the second milestone outcome has been achieved with the Steering Committee endorsing the revised workshop content. Dates have been set for all the workshops and locations booked.

There are 2 objectives regarding this project:

- 3) The identification of strategies to effectively manage aquatic animal health (AAH) emergencies;
- 4) The provision of responsive emergency training workshops suitable for both employers and employees of the aquaculture industry.

The idea behind the 2 – 2.5 hour duration workshops is a simplistic approach, a workshop educating signs of AAH to look out for, basic contingency management and points of contact to remember in the instance of an AAH emergency.

Considerable research has resulted in the selection of appropriate strategies and the development of an effective workshop program which will be conducted in early December. The second Steering Committee Meeting endorsed the final workshop program subject to some amendments which individual Committee members had requested. As a consequence, the final documentation has been prepared for the workshop presentations.

(report on the overall progress of the project and how that aligns with achieving project objectives as specified in the agreement.)

REPEAT THE FOLLOWING THREE SECTIONS FOR EACH MILESTONE IN THE PERIOD:

ORIGINAL MILESTONE DATE AND TITLE:

4 December 2002 – Steering Committee Meeting; Review and Finalisation of Training Workshop Structure and Content

REVISED MILESTONE DATE AND TITLE:

(only if previously arranged)

PROGRESS AGAINST MILESTONE:

The Steering Committee met for the second time on Friday 22 November 2002 at the PIRSA Conference Room in Adelaide. The Committee comprises Melanie Ryan (Seafood Training SA), Mark Cody (Seafood Training SA), Doug Parker (Australian Fisheries Academy), Marty Deveney (PIRSA – Fish Health Unit) and Steve Clark (SARDI).

Doug Parker, Steve Clark and Marty Deveney all tendered their apologies and Dr Colin Johnston Manager of the PIRSA Fish Health Unit stood in for Marty Deveney. Although Doug Parker was unable to attend the meeting, he met with the Principal Investigator prior to the Steering Committee Meeting to provide his views on the draft program and content. Steve Clark promised to provide comment on the proposed program and structure of the workshops and this was supplied to the Principal Investigator on 25th November 2002.

The meeting discussed progress on the draft document and the structure of the workshop program. The following points were noted during the meeting:

The draft program had come a long way from earlier drafts and represented a fairly solid summary of fish health emergencies and how to deal with them.

The terminology had to describe what to look for in basic terms and what to do and what not to do when an emergency was identified. A number of changes were put forward to further clarify some of the statements in the material.

Committee Members were strongly supportive of the “Think the Worst First” approach and having the draft sheet prominently displayed in key workplace areas.

It was recognised that the approach was naturally generic for the industry, however, individual sectors would still need to be able to contextualise for their species or particular local arrangements. The aim was to have a reference document and support materials that could be transmitted electronically to the whole industry and allow for contextualisation.

Information on specific diseases for common species was not readily available or in a form that would allow for quick recognition often by farm hand personnel who tend to be the front line operatives. The approach which had been taken was to list the notifiable diseases and provide some common signs of abnormal aquatic animal health. Further work was needed to more adequately identify diseases for new aquaculture species such as Yellowtail Kingfish and Mulloway.

The structure of the workshops that was agreed to at the first committee meeting was once again emphasised, namely that they should be an awareness and information session comprising:

- A Basic review of AAH

- Definitions of disease (host/pathogen/environment/exotic/endemic) and basic observations of disease/trends
- Contingency planning/developing standard operating procedures (Aquavetplan)
- Points of contact in the event of an emergency (local/state/national)
- Translocation/quarantine

The draft workshop material that had been prepared included some examples of disease events in other countries (Case Studies) to emphasise the devastating effect that they have had on the industry overseas. Agreement was reached on the inclusion of information on all notifiable diseases, the role of the OIE, the occurrence of diseases in Australia and the Management of Aquatic Animal Disease Emergencies section taken from the AQUAVETPLAN.

There was agreement that the workshop material should also include a website reference section for aquaculturalists to undertake further research on their species.

In developing the materials, the research team had live tested the central out of hours emergency number and discovered that it was unable to function effectively. Dr Johnston had agreed to rectify the situation so that incidents were directed to the Fish Health Officers out of hours.

There was agreement that all Associations should be notified and requested to pass the information about the workshops to their members. There was also a recognition that not all invitees would attend the sessions and it was agreed that the final materials would need to be distributed as widely as possible preferably through email to allow for local amendments.

(report on the research undertaken to achieve each milestone since the last report. Reports should contain enough detail to establish the objectives and outcomes of each milestone, as well as how it was achieved. Relevant tables and figures can also be included)

SPECIAL CONDITIONS

N/A

INTELLECTUAL PROPERTY ISSUES ARISING:

N/A

CONTACT WITH BENEFICIARIES:

Initial contact had been made with industry associations to get support for the workshops. This was followed up in setting workshop dates and hiring venues.

Draft materials were routinely emailed to all Committee Members for comment during the development process. Both major training providers in the State who service the aquaculture industry were alerted to the workshop program and invited to contribute ideas.

PROGRESS AGAINST COMMUNICATION & EXTENSION PLAN:

Formal notification and a brief presentation was provided to the SA Aquaculture Council comprising the Presidents of all the industry's Associations. A number of discussions took place with individual Association personnel and comments offered were included in the development of the workshop materials. The level of support offered by these personnel augured well for the workshop program.

VARIATIONS TO PROJECT:

N/A

MILESTONE PROGRESS REPORT 3



FISHERIES
RESEARCH &
DEVELOPMENT
CORPORATION

FRDC PROJECT NUMBER: 2002/664

PROJECT TITLE: Aquatic Animal Health Emergency Management Training and Incident Simulation

PRINCIPAL INVESTIGATOR: Melanie Ryan (Special Projects Officer – Seafood Training SA)

OVERALL PROJECT PROGRESS:

Aquatic Animal Health Emergency Workshops have been successfully conducted in one city location and four regional South Australian centres.

The workshops lasted between one and a quarter hours and two and a quarter hours. Three workshops lasted approximately two hours. Attendance at the workshops varied but key industry personnel from all sectors were in attendance.

(report on the overall progress of the project and how that aligns with achieving project objectives as specified in the agreement.)

REPEAT THE FOLLOWING THREE SECTIONS FOR EACH MILESTONE IN THE PERIOD:

ORIGINAL MILESTONE DATE AND TITLE:

14 December 2002 Workshops completed throughout key regional and city locations

REVISED MILESTONE DATE AND TITLE:

(only if previously arranged)

PROGRESS AGAINST MILESTONE:

Formal invitations were sent to all Associations and 116 individual companies. Several Associations distributed the information to all their members. The Inland Aquaculture Association contacted over 170 growers, the SA Oyster Growers Association contacted all 110 members, the SA Finfish Farmers Association contacted all their 13 Members and Associate members. Tuna farm operators, abalone growers and key freshwater crayfish growers were also contacted. In all some 450 growers were contacted either directly or indirectly.

Aquatic Animal Health emergency Workshops were held in five centres in South Australia:

29 November Port Adelaide, Fishing Industry House 5 Attendees
 29 November Robe, Caledonian Hotel 9 Attendees
 3 December Ceduna, Spencer Institute of TAFE 2 Attendees
 4 December Port Lincoln, Australian Fisheries Academy 17 Attendees
 5 December Cowell, Cowell Football Club 29 Attendees

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The first workshop in Port Adelaide was run jointly by the Principal Investigator, Melanie Ryan and Mark Cody. The remaining workshops were run by Mark Cody.

Each workshop took the form of a general introduction, a twenty minute overhead presentation covering key points in the workshop handout and a question and answer session. Questions were encouraged during the presentation component and some sessions were highly interactive. In the case of Robe and Port Lincoln, there were extensive discussions after the workshop in a more informal atmosphere.

Copies of the workshop handout and "Think the Worst First" sheets were handed to all participants. 38 copies of the workshop materials were mailed to companies that were unable to attend the workshops. 51 companies apologised for non attendance on the day of the workshop.

As there could be requests for inclusion of material that had not been anticipated, the handouts were regarded as Final Drafts that could be amended in the light of any additional information that came out of the workshops. Generally, the material was well targeted and very well received. Numerous speakers at all sessions spoke highly of the material and the workshops and were keen to see some practical material on AAH emergencies.

The decision to use plain language was well received. Speakers commented that the material would be used by all staff and having the information in plain language was necessary for many farm hand personnel. Several suggested that it would form the key training document on AAH emergencies for all staff.

The decision to introduce the session with some devastating case studies set the tone for the rest of the workshops. The rest of the session structure focussed on observational signs of disease, points of contact, basic contingency planning, translocation and the status of AAH in Australia.

The workshops provided an ideal avenue for talking about "common industry procedures" such as visiting neighbouring farms when there was a "problem" with the fish, sending long dead samples for analysis and simply leaving possible problems observed on a Saturday until the boss comes in on Monday.

The sessions highlighted that very few farms had a basic sample kit, none had any formal procedures in place for aquatic health emergencies and in the case of the oyster industry, the SASQAP representative in Port Lincoln was seen as the only reference point for an emergency. None of the oyster growers had a back up plan if he was unavailable.

Workshop participants freely volunteered that they had little knowledge about the range of diseases that might affect their stock and none had any method of identifying disease trends. Even though much of the information in the handout was fairly basic, it was clearly needed by the majority of companies.

Communication was an area of considerable weakness for most participants. Many participants had no idea who to ring if there was a problem, especially out of hours. Having a central number 24 hours a day was clearly a positive move.

The role of the State Fish Health Officers was discussed at all the sessions. Whilst they were not in attendance at any of the sessions, their role was supported provided they understood how the industry worked. Several speakers expressed concern that focussing on policy

development before they had a chance to work with the industry might not give them the right insight into practical aquatic health issues. A couple of speakers welcomed the proposed program of contact with the industry that they are hoping to schedule next year.

Transporting times for samples was an interesting topic for many growers as distances from laboratories can be outside the preferred delivery time. It focussed thinking on ways to get the samples to the laboratory quickly rather than use Australia Post.

As expected, the workshops did show up some gaps in the material. One suggestion was that a Monitoring Template could be distributed which might help personnel record behavioural trends such as fish sluggish, not taking much food etc. An attempt has been made to devise such a form for finfish growers which also looks at other monitoring tasks such as water quality.

The generic form of the workshop handout was both useful in introducing the range of diseases and in covering common response requirements. However, information on molluscs is of little use to fin fish growers and vice versa. Some speakers asked if there was a possibility of having the document refined to make it more finfish or mollusc specific. As the changes required to achieve this are relatively small, this is being undertaken after the workshops for distribution through the relevant Associations.

All participants supported the development of a disease manual which gave practical information with colour photos of the more common diseases. Whilst there are some such documents in print, especially in Japan, there does appear to be a need to provide a more comprehensive disease manual for operatives rather than biologists. Such a manual would have external and internal pictures with brief descriptions of symptoms and action that needs to be taken. The development of such a manual was clearly outside the scope of this project but is without doubt a necessary follow up requirement.

A few participants discussed the possibility of engaging the local veterinarian as part of any identification and management regime. The lack of specific aquatic training was seen as the principal impediment especially in rural areas where the local VET specialises in sheep, cattle, horses and dogs and cats. Nonetheless, the suggestion of a register of VETS who have skills in the aquatic field was seen as valuable.

In terms of meeting the goal of providing practical support information on AAH emergencies, the workshops were very successful. Judging by the range of questions and the issues that were raised from the floor, the format and level of information was about right. One prominent industry person summed it up when he stated that the information was sorely needed as most staff wouldn't have a clue about animal health and few farms have the luxury of a biologist on hand, let alone a laboratory or even a microscope.

(report on the research undertaken to achieve each milestone since the last report. Reports should contain enough detail to establish the objectives and outcomes of each milestone, as well as how it was achieved. Relevant tables and figures can also be included)

SPECIAL CONDITIONS

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INTELLECTUAL PROPERTY ISSUES ARISING:

N/A

CONTACT WITH BENEFICIARIES:

Registered Training Organisations as well as industry representatives were invited to the workshops and attended most sessions. A presentation was given to the SA Aquaculture Council in December on the workshops and all Presidents in attendance were keen to further promote the material throughout the industry. This augurs well for wider implementation although the level of support may also be due in part to other complimentary initiatives currently being pursued especially in environmental management.

PROGRESS AGAINST COMMUNICATION & EXTENSION PLAN:

The level of communication was sufficiently comprehensive to ensure that the industry was well aware of the workshops and the materials. This communication remains strong and will be utilised to further emphasise the need to be aware of AAH issues. The role of the Associations has proven to be extremely valuable in promoting AAH issues. The support provided to these workshops suggests that their role will remain critical in getting commitment across their sectors.

VARIATIONS TO PROJECT:

N/A

Note:

*Projects with suffix \leq 2000:
These progress reports should be submitted in accordance with the milestone schedule.*

Projects with suffix \geq 2001:

These progress reports must be submitted in accordance with the agreed schedule in Part 2 of the Project Agreement, and must be accompanied by a tax invoice for the agreed amount.

MILESTONE PROGRESS REPORT FINAL



FISHERIES
RESEARCH &
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CORPORATION

FRDC PROJECT NUMBER: 2002/664

PROJECT TITLE: Aquatic Animal Health Emergency Management Training and Incident Simulation

PRINCIPAL INVESTIGATOR: Melanie Ryan (Special Projects Officer – Seafood Training SA)

OVERALL PROJECT PROGRESS:

Project Objectives

The Project had to achieve two objectives,

1. The identification of strategies to effectively manage aquatic animal health emergencies and
2. The provision of aquatic animal health emergency training workshops for both employers and employees of the aquaculture industry.

Both of these objectives have been met.

SUMMARY

The research component of the project provided some interesting findings particularly in relation to a lack of a simple listing of common diseases and common symptoms. The original notion was that such information was readily available and simply needed to be collated for the industry. Although some valuable material such as the Aquavetplan, OIE listings and the Australian Aquatic Animal Diseases ID Field Guide was sourced and used in the workshops, there is still a distinct gap in relation to classifying diseases by genus and even species. Similarly, the research clearly showed that there was a common absence of effective management strategies in nearly all aquaculture sectors. (cf. The recently released “Survey toolbox for aquatic animal diseases: A practical manual and software package”, Cameron, A. 2002, ACIAR, Canberra, 375pp).

Research into a number of domestic and overseas sectors also failed to find any good practice management strategies. Some strategies such as the Tasmanian salmon industry model appear to be working reasonably well. The principal problem appeared to be a lack of communication between fish health representatives and aquaculture companies. No examples were found of strategies that effectively involved all company operatives with an industry sector.

Early industry investigations clearly showed that any material or workshops for aquatic animal health emergencies had to be simple in format and provide clear

information on what to look for, what to do, and who to tell. The absence of any information on these issues was generally common across the industry.

The eventual workshop programs had to provide both information and supportive material to ensure that the aquaculture industry understood the threats that aquatic diseases pose to the industry and some simple practical tools to manage an emergency situation.

The original concept behind the workshops was that these would be a formal training vehicle that would possibly attract user choice and FarmBis funding. The thinking behind this was that the workshops would be a highly structured method of imparting information and that the whole program would meet national competency standard requirements. In practice this latter requirement has been more than met, but the need for a highly structured workshop format that took the form of a traditional training program was not supported by individual aquaculture companies. The other reason for this was that the research phase confirmed that by far the majority of farms had no personnel with significant biological expertise. This suggests that a second tier of more specialised training is necessary in the future.

The emphasis in the workshops shifted to providing basic information on disease identification and support material that could form the basis for individual company responses. This also gave participants the opportunity to openly discuss issues rather than simply adopting a standard training approach. Hence the eventual structure of the workshops and the content of the support material were designed to meet the needs of the industry rather than a notional training model.

The original project concept also saw the workshops as the “final” training intervention with any workshop support material not requiring further refinements. Information gleaned during the development of the project clearly pointed to the workshops providing a forum for further refinement and modification to the support materials. This has proven to be extremely valuable and further enhanced the final materials.

A series of 5 workshops was conducted across South Australia during November and December 2002 with sixty two people attending. A total of 38 copies of the workshop material were also mailed to companies that were unable to attend and requested copies. Attendees at the workshops represented individual farms and training organisations.

Following the workshops, some of the materials were refined and improved for despatch to all industry sectors. The research also confirmed that enterprises preferred to have the material in an electronic form so that they could badge the material as company specific AAH emergency manuals. Feedback from companies suggested that these manuals would be used for induction of new employees as well as a standard operating procedure for existing staff.

PROJECT PHASES

1.Literature Search and Review for Training Workshops

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An extensive literature search was undertaken involving both domestic and overseas aquaculture operations and material. The Aquavetplan approach was seen as informative but difficult to use for the majority of staff below management level. The Herfort/Rawlin text on aquatic animal disease was seen as very useful but limited in coverage and sector specificity. Material was evaluated from the Animal Health Australia (AHIA) website, the OIE, CSIRO, Western Australian Fisheries, PIRSA, four projects from the FRDC program, specific disease information from Norway and USA and management systems from the Tasmanian Salmon industry and the New Brunswick Government.

The literature generally showed that few aquaculture sectors had designed a basic emergency response program with many examples showing some action after a serious fish health event. It was surprising to note that there was an absence of a planned approach to disease management.

The research phase of the project also involved detailed discussions with Fish Health Officers, Industry Associations and peak bodies, as well as individual growers. The need for a balance between the biological perspective and operator competency was strongly emphasised by industry representatives.

A Steering Committee was established comprising the Principal Investigator, the Project Manager, a Fish Health Officer, a Research Scientist and a Training and Post Harvest representative.

The research confirmed that the workshop structure should adopt a simplistic “for your information” approach consisting of 5 key elements:

- Basic review of AAH at the local/state/national level – who looks after what.
- Definitions of disease and basic observations of disease/trends.
- Contingency planning/developing of standard operating procedures (Aquavetplan)
- Points of contact in the event of an emergency (local/state/national)
- Translocation/environmental factors (pollution/algal blooms)

The initial research supported delivering a number of workshops both in regional and city areas. The initial Steering Committee meeting endorsed holding five workshops in Port Adelaide, Robe, Ceduna, Port Lincoln and Cowell.

2.Contact with Individual Associations

An attempt was made to get a broad range of views from the industry so that the workshops would be effective in covering key disease management issues and meet enterprise capacity. Discussions took place with the SA Aquaculture Council and individual grower companies in both fin fish and oysters.

Information provided from these organisations clearly supported a simplistic workshop approach where growers could take home some practical information on the who, what, how and when of disease events. There was strong support for

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practical tools that helped operators identify disease and know how and who to communicate with.

Organisations emphasised the need to have workshops across the State to ensure that all growers had the opportunity to participate. Some growers felt that any program should meet individual sector needs.

3. Training Workshops Trialled with Sample Enterprises

This was deemed to be not relevant due to the high quality of information gleaned from the initial industry contact and some clear directions for content and format emanating from the literature search. The thinking behind this phase was that a document would be trialled with a small group of companies and refined for the larger industry workshops. As the final workshops would have produced further refinements and additions to the material, it was felt that the regional workshops would provide a better range of information for finalising the material.

This decision was also influenced by feedback from growers that suggested there should be some contextualisation of the material for specific sectors/companies following the workshop delivery. It is worth noting that the shift in thinking away from a narrower training concept to a more interactive workshop approach supported the notion of changing the workshop material after delivery of the workshops.

4. Marketing and Advertising of Training Workshops

The SA Aquaculture Council was informed about the workshops at its full Council meeting and all Association Presidents were requested to notify their members of the workshop program. Some Associations were more effective in their marketing than others and this ultimately affected the response levels in the various workshop locations.

A number of individual growers were contacted directly to ensure that the message was being delivered. In some cases they had been advised by their Association, in others they were unaware until contacted.

The two Registered Training Organisations currently delivering aquaculture training to the industry in South Australia were also invited to attend the workshops as well as one school specialising in School Based Apprenticeships in Aquaculture, Cowell Area School.

Formal invitations were sent to all aquaculture associations and 116 individual companies. Several associations distributed the information to all their members. The Inland Aquaculture Association contacted over 170 growers, the SA Oyster Growers Association contacted all 110 members, the SA Finfish Farmers Association contacted all their 13 members and associate members. Tuna farm operators, abalone growers and key freshwater crayfish growers were also contacted. In all

some 450 growers were contacted either directly or indirectly out of a total State register of some 860 licenced growers.

An advertisement was placed in the Eyre Peninsula Tribune advertising the Cowell Workshop program. The Cowell workshop was a little different to the others in that a renowned international fish health expert, Dr Mark Shepherd was giving a talk on marine finfish health issues after the morning AAH emergency workshop. Dr Shepherd also contributed to the AAH emergency workshop and was very supportive of the approach being adopted.

A number of apologies were received for all workshops due to workload and the emerging Christmas /New Year period. Where these occurred prior to the workshops, copies of the workshop material were sent out. A total of 38 copies were mailed to individual growers who rang in. A total of 51 companies apologised on the day of the workshop and requested copies of the material be emailed or mailed to them. This was subsequently done after a number of changes were incorporated.

5.Workshops conducted in major regional and city locations

Animal Health Emergency Workshops were successfully conducted in one city location and four regional South Australian centres during November and December 2002.

6.Structure of the workshops

The workshops lasted between one and a quarter hours and two and a quarter hours. Three workshops lasted approximately two hours. Attendance at the workshops varied, but key industry personnel from all sectors were in attendance along with the major training organisations and one school that is involved in School Based Apprenticeships in aquaculture (Cowell Area School).

A total of 62 persons attended the five workshops.

The first workshop in Port Adelaide was run jointly by the Principal Investigator, Melanie Ryan and Mark Cody. The remaining workshops were run by Mark Cody.

Each workshop took the form of a general introduction, a twenty minute overhead presentation covering key points in the workshop handout and a question and answer session. Questions were encouraged during the presentation component and some sessions were highly interactive. In the case of Robe and Port Lincoln, there were extensive discussions after the workshop in a more informal atmosphere. Information from the workshop at Cowell featured prominently in the following marine finfish workshop conducted by Dr Mark Shepherd.

7.Key outcomes from the workshops

As there could be requests for inclusion of material that had not been anticipated, the handouts were regarded as Final Drafts that could be amended in the light of any

additional information that came out of the workshops. Generally, the material was well targeted and very well received. Numerous speakers at all sessions spoke highly of the material and the workshops and were complimentary about the practical material on AAH emergencies that was distributed.

The decision to use plain language was well received. Speakers commented that the material would be used by all staff and having the information in plain language was necessary for many farm hand personnel. Several suggested that it would form the key training document on AAH emergencies for all staff. A number of participants noted that they had no biologist or senior technician on their staff and that for health matters they had to rely on outside specialist personnel. This made the simplistic nature of the information even more critical for general usage.

The decision to introduce the session with some devastating case studies set the tone for the rest of the workshops. The rest of the session structure focussed on observational signs of disease, points of contact, basic contingency planning, translocation and the status of AAH in Australia.

The workshops provided an ideal avenue for talking about “common industry procedures” such as visiting neighbouring farms when there was a “problem” with the fish, sending long dead samples for analysis and simply leaving possible problems observed on a Saturday until the boss comes in on Monday. Participants were challenged to respond to a hypothetical emergency situation when due to a special local event no-one was contactable. Most participants then understood the value of adopting a “think the worst first” approach and using the emergency points of contact list.

The sessions highlighted that very few farms had a basic sample kit, none had any formal procedures in place for aquatic health emergencies and in the case of the oyster industry, the SASQAP representative in Port Lincoln was seen as the only reference point for an emergency. None of the oyster growers appeared to have a back up plan if he was unavailable.

Workshop participants freely volunteered that they had little knowledge about the range of diseases that might affect their stock and none had any method of identifying disease trends. Even though much of the information in the handout was fairly basic, it was clearly needed by the majority of companies.

Communication was an area of considerable weakness for most participants. Many participants had no idea who to ring if there was a problem, especially out of hours. Having a central number 24 hours a day was clearly a positive move. Participants also valued the fact that the Principal Investigator had at an early point in the development of the workshop material undertaken a “live” trial with the 24 hour number at Fishwatch and found that it was unable to respond. Subsequent changes were implemented in Fishwatch prior to the workshop program to ensure that the system worked.

The role of the State Fish Health Officers was discussed at all the sessions. Whilst they were not in attendance at any of the sessions, their role was supported provided they understood how the industry worked. Several speakers expressed concern that

focussing on policy development before they had a chance to work with the industry might not give them the right insight into practical aquatic health issues. A couple of speakers welcomed the proposed program of contact with the industry that they are hoping to schedule next year.

Transporting times for samples was an interesting topic for many growers as distances from laboratories can be outside the preferred delivery time. It focused thinking on ways to get the samples to the laboratory quickly rather than use Australia Post.

8. Suggestions for Improvement

As expected, the workshops did show up some gaps in the material. One suggestion was that a Monitoring Template could be distributed which might help personnel record behavioural trends such as fish sluggish, not taking much food etc. An attempt has been made to devise such a form for finfish growers that also looks at other monitoring tasks such as water quality.

The generic form of the workshop handout was both felt by most participants to be useful in introducing the range of diseases and in covering common response requirements. However, information on molluscs is of little use to fin fish growers and vice versa. Some speakers asked if there was a possibility of having the document refined to make it more finfish or mollusc specific. As the changes required to achieve this are relatively small, this is being undertaken after the workshops for distribution through the relevant Associations.

All participants supported the development of a disease manual that gives practical information with colour photos of the more common diseases. Whilst there are some such documents in print, especially in Japan, there does appear to be a need to provide a more comprehensive disease manual for operatives rather than biologists (cf. Australian aquatic animal disease identification field guide, Herfort, A and Rawlins, G. 1999, AFFA). Such a manual would have external and internal pictures with brief descriptions of symptoms and action that needs to be taken. The development of such a manual was clearly outside the scope of this project but is without doubt a necessary follow up requirement.

A few participants discussed the possibility of engaging the local veterinarian as part of any identification and management regime. The lack of specific aquatic training was seen as the principal impediment especially in rural areas where the local VET specialises in sheep, cattle, horses and dogs and cats. Nonetheless, the suggestion of a register of VETS who have skills in the aquatic field was seen as valuable. This was to be followed up with PIRSA.

Some participants voiced concern about any detailed sampling requirements citing a lack of biological expertise in providing such samples as fish kidneys, gills etc. It is understood that this will be addressed as part of a more comprehensive training program for the industry which the State Fish Health Officers will be involved with. However, the need for a basic program for all operatives was recognised in several workshops.

One participant asked if the material could incorporate a series of identification trees. The difficulty of including such tools at this level is unfortunately outside the scope of the current project budget as it would require a detailed individual disease investigation for all diseases in all sectors.

Environmental issues such as ballast water were also seen as an important potential problem that needed to be recognised in any emergency program.

OVERALL WORKSHOP SUMMARY

In terms of meeting the goal of providing practical support information on AAH emergencies, the workshops were very successful. Judging by the range of questions and the issues that were raised from those attending, the format and level of information was about right. One prominent industry person summed it up when he stated that the information was sorely needed as most staff wouldn't have a clue about animal health and few farms have the luxury of a biologist on hand, let alone a laboratory or even a microscope.

The most important outcomes were the inclusion in the material of two key information handouts. The first covers the emergency points of contact and the second, entitled "Think the Worst First", covers a basic four step approach to dealing with aquatic animal health emergencies. The second sheet covers the four standard procedures of dealing with an emergency - Identify, Alert, Response and Action. Participants were encouraged to have both these sheets displayed prominently in key work areas such as lunch rooms and sheds.

The workshops have been well timed in addressing the issue of aquatic animal health emergencies in that the industry was particularly receptive to the issue following a number of incidents in other States and overseas. The level of information was about as much as the audience could take in given their lack of any biological expertise. Feedback immediately after the workshops and in the four weeks since have confirmed that participants found the material valuable in putting in place emergency response systems that can effectively deal with a potential disease crisis. If this is the first serious industry wide attempt to deal with any health emergency, then further more detailed support programs can only build on this approach.

As a key educative tool, the workshops and the support material clearly raised awareness, but more importantly gave growers some practical tools, albeit basic in nature. This approach clearly matched the level of learning within the industry and suggests that a second and more specialised tier will be needed at a later date.

FINALISATION OF THE PROJECT

Following the workshops, the suggestions and recommendations which came out of the workshop discussions were considered and a number of amendments made to the material. The major changes were:

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The development of sector specific materials for oyster and finfish as well as a generic package

The inclusion of a sample monitoring sheet (principally for finfish) covering a range of possible monitoring issues and recording health issues.

The final workshop materials have been amended to reflect these changes and have been prepared for distribution to all industry sectors.

The project effectively completed on 7 January 2003 with the Final Steering Committee Meeting being held on Friday 10th January 2003 to consider and endorse the Final Report. The Final Steering Committee Meeting endorsed the Final Report with some minor amendments and the outcomes of the project. The meeting was attended by all Committee Members, Dr Martin Deveney, Dr Steven Clarke, Mr Douglas Parker, Ms Mel Ryan and Mr Mark Cody.

The Committee felt that the approach taken and the workshop program was relevant for all sectors of the aquaculture industry in all States and Territories. Although sector specific manuals had been prepared for the mollusc and finfish sectors, the preferred position was to promote the general manual so that industry personnel could see what diseases were prevalent in other sectors.

The need for a second stage program covering points raised in the Final Report was also endorsed. This would be the subject of some further discussions between the Committee and FRDC.

There was some discussion regarding the draft Monitoring Form and some changes were agreed to which Drs Deveney and Clarke will undertake by 17 January. As soon as this document has been completed, all documentation will be forwarded to Dr Bernoth.