FINAL REPORT

aquatic animal health subprogram

Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of the Western Australian Department of Fisheries and industry bodies associated with freshwater crayfish

Frances Stephens

May 2004

FRDC Project No. 2003/671

Australian Government
Department of Agriculture, Fisheries and Forestry

Government of Western Australia
Department of Fisheries

Fish for the future

Australian Government
Fisheries Research and Development Corporation

Authors: Frances Stephens, Brian Jones, Iain East, Karina Scott, Simon Bennison.

Title: Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of the Western Australian Department of Fisheries and industry bodies associated with freshwater crayfish culture.

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Glossary of acronyms

ACWA	Aquaculture Council of Western Australia
AAHL	Australian Animal Health Laboratory
AFDL	AAHL Fish Diseases Laboratory
AGDAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DoF	Department of Fisheries, Government of Western Australia
FRDC	Fisheries Research and Development Corporation
LDCC	Local Disease Control Centre
MUP	Minor Use Permit
NGO	Non-Government Organisation
OCVO	Office of the Chief Veterinary Officer
OIE	Office International des Épizooties (World Animal Health Organisation)
PCR	Polymerase Chain Reaction
SAD-EMP	State Animal Diseases - Emergency Management Plan
SDCHQ	State Disease Control Headquarters
WA	Western Australia
WAYPA	Western Australian Yabby Producers Association
WAMGA	Western Australian Marron Growers Association

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Project investigators

Project title	Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of the Department of Fisheries and industry bodies associated with freshwater crayfish culture
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2003/671 Aquatic Animal Health Subprogram: enhancing the emergency disease response capability of the Department of Fisheries and industry bodies associated with freshwater crayfish culture

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Objectives

1. To examine and test the skills and abilities of the participants in group problem solving and decision making skills relating to emergency response procedures.
2. To increase participants' knowledge of communication routes to be used in an emergency disease response by working through a scenario which mimics a real emergency situation.
3. To clearly define the roles within and between the various agencies involved and how they fit within the WA Emergency Plan and AQUAPLAN frameworks.
4. To improve participants' ability to manage tasks by prioritizing a number of competing demands during the operational phase of an emergency response.
5. To increase participants' understanding of the operational procedures in the Disease Emergency Response.
6. To familiarize participants with operational practices on freshwater crayfish farms of varying production technology (extensive and semi-intensive).
7. To identify key areas for improvement in emergency management procedures across a range of subjects including planning, communication, staffing and resourcing.
8. To document an emergency response plan that can be implemented by all stakeholders.
9. To familiarize all stakeholders including AGDAFF staff with the problems inherent in managing a disease in *Cherax* freshwater crayfish species that exist across Australia.

Non-technical summary

Outcomes achieved

Outcomes of the exercise included the identification of the following recommendations:

1. The Department of Fisheries should provide up to date contact lists to aquaculturists.
2. The Department of Fisheries and freshwater crayfish aquaculture organizations should continue to foster close relations with each other.
3. The Department of Fisheries Emergency/Incident Management Plan should be revised to include details on the roles and responsibilities of other agencies in the response to a disease emergency in fisheries and to ensure that these agencies are aware of their role in fisheries emergencies. These agencies should be involved in future emergency responses and training exercises.
4. That a paper exercise be conducted by the Western Australian Department of Fisheries to identify appropriate numbers of staff to be involved in the response to an emergency disease incident, and alternate staff that could take the role of a relieving team if the emergency persists.
5. In a large-scale aquatic disease emergency, a dedicated website should be developed and maintained by industry to provide information about the emergency and its progress.
6. Aquaculture organisations should identify weaknesses in biosecurity associated with various farm practices and make recommendations for best practice in their industry.
7. Regular disease emergency exercises are recommended to maintain staff preparedness and to address any deficiencies that were identified in earlier exercises.

Funding for this project was provided to enable an exercise simulating an outbreak of crayfish plague to be conducted in Western Australia. Crayfish plague is a fungal disease (*Aphanomyces astaci*) that has devastated some freshwater crayfish populations in Europe but has never been recorded in Australia. The exercise was planned around a fictitious outbreak of crayfish plague and was held on 10 and 11 February 2004. Iain East and Karina Scott from the Australian Government Department of Agriculture, Fisheries and Forestry planned and facilitated the exercise.

The first day of the exercise was held in Perth and simulated a State Disease Control Headquarters (SDCHQ) in the early stages of a disease outbreak following definitive diagnosis of crayfish plague. Participants included twelve employees of the Western Australia Department of Fisheries, three employees of other Western Australian government departments and four representatives of the yabby (*Cherax albidis*) and marron (*Cherax tenuimanus*) aquaculture industry. The exercise was useful in clarifying the roles of various people during an outbreak and the impact that such a disease would have on the aquaculture industry.

The second day of the exercise was held in Manjimup to enable marron and yabby aquaculturists to attend. More than twenty marron growers and their representatives, a representative of the Yabby Producers Association of Western Australia, two regional officers of the Department

of Fisheries and five representatives of the Fish Health Unit of the Department of Fisheries attended. Participants were randomly allocated to five groups, each representing a fictional marron or yabby farm. The groups were asked to outline the actions and strategies that they would undertake following an outbreak of crayfish plague on a fictitious farm in the south west of Western Australia.

The participants benefited from the opportunity to practise their possible roles and actions during a disease emergency and to meet people from other industry sectors who would also be involved in a real emergency. The need for close liaison between the various groups became apparent on both days of the exercise. Aquaculturists were surprised to find that their enterprise would probably be immediately and severely affected by an outbreak of crayfish plague some distance from their own premises. The outcomes of the exercise included the identification of the need to improve some aspects of disease emergency planning procedures and the need for good communication networks during disease outbreaks. The impact of biosecurity practices on aquaculture farms was also identified as having a significant impact on the progress of spread of disease and the likelihood of individual farms becoming infected.

CRAYFISH PLAGUE IS A MAJOR DISEASE AFFECTING FRESHWATER CRAYFISH IN SOME AREAS OF THE WORLD. THE DISEASE HAS NEVER BEEN REPORTED IN AUSTRALIA. THE SIMULATION EXERCISE THAT WAS UNDERTAKEN AS PART OF THIS PROJECT WAS A RESPONSE TO A FICTITIOUS OUTBREAK OF CRAYFISH PLAGUE.

KEYWORDS: Emergency management, crayfish plague, disease, aquaculture, freshwater crayfish, simulation excercise.

Acknowledgements

Karina Scott, Australian Government Department of Agriculture, Fisheries and Forestry, Dan Sampey and Carey Nagle from the Marron Growers Association of Western Australia assisted in the planning stages of the exercise. Their input helped to make it a more realistic and useful exercise. Dr Greg Maguire provided additional input.

Background

In recent history numerous wild fisheries and aquaculture industries worldwide have suffered major economic and production losses through the impact of disease epidemics. Australia has avoided some of these epidemics to date, but the pilchard (*Sardinops sagax ocellatus*) Herpesvirus epidemics in 1995 and 1998 and the crustacean white spot scare in 2001 have highlighted the real risk of major disease events in this country. Through the development of AQUAPLAN the Australian government has sought to improve the emergency disease response capability. This seeks to develop effective institutional arrangements to manage disease emergencies and involves the staging of simulation exercises to test the capability and capacity of Australia's state and territory agencies.

Need

Relatively few major disease events have occurred within the WA aquaculture industries and as a result there has not been an opportunity for an integrated multi-agency approach, though one has been developed on paper. To date, apart from a very labour intensive response to the discovery of the microsporidian *Thelohania* sp. in yabbies (*Cherax albidis*), no large-scale containment or eradication programs have been undertaken with respect to aquatic animal diseases. The Department of Fisheries is fortunate that it is remote and isolated, however, there is a need for periodically challenging the Department's ability to handle emergencies. Simulation exercises provide a practical method of exposing and training staff in the management of aquatic disease emergencies and one has been held with the non-maxima pearling industry (FRDC Project 2002/668).

The need can be summarized as follows:

1. Both government and aquaculture industries in Western Australia have had few real, large-scale emergencies.
2. There is a cohesive management strategy setting out the roles and responsibilities of individuals and agencies involved, but it has not yet been used for multi-agency emergencies.
3. The potential implications of a major disease emergency may not be fully comprehended because there have been few emergencies faced by each industry sector. There is a need to periodically challenge industry and government agencies to ensure that they remain focused on disease preparedness.
4. The freshwater crayfish industry in Western Australia is very keen to conduct the exercise and integrate the crayfish plague projects from N Buller (Department of Agriculture) and F Stephens, Principal Investigators of projects developing a standard diagnostic test for crayfish plague (FRDC Projects 2001/621 and 2004/091) and a crayfish plague disease strategy manual (FRDC Project 2002/641), respectively.

Objectives

1. To examine and test the skills and abilities of the participants in-group problem solving and decision making skills relating to emergency response procedures
2. To increase participants' knowledge of communication routes to be used in an emergency disease response by working through a scenario which mimics a real emergency situation.
3. To clearly define the roles within and between the various agencies involved and how they fit within the WA Emergency plan and AQUAPLAN frameworks.
4. To improve participants' ability to manage tasks by prioritizing a number of competing demands during the operational phase of an emergency response.
5. To increase participants' understanding of the operational procedures in the Disease Emergency Response.
6. To familiarize participants with operational practices on freshwater crayfish farms of varying production technology (extensive and semi-intensive).
7. To identify key areas for improvement in emergency management procedures across a range of subjects including planning, communication, staffing and resourcing.
8. To document an emergency response plan that can be implemented by all stakeholders.
9. To familiarize all stakeholders including DAFF staff with the problems inherent in managing a disease in *Cherax* species of freshwater crayfish that exist across Australia.

Methods

The exercise was designed to mimic the commencement of the operational phase of a disease emergency event after the diagnostic team has confirmed the emergency. The emergency was entirely fictitious in nature.

The exercise was conducted in two parts:

Day 1 Command post exercise – SDCHQ

The participants operated within a single room and used only the facilities and resources within the room to conduct an operational phase of the response to a confirmed disease incursion. The exercise was pre-scripted by the controlling staff from the Australian Government Department of Agriculture, Fisheries and Forestry.

The participants reacted to a given scenario and prepared detailed action plans. The plans were then presented and defended during a debriefing session. The success of the exercise was determined by the appropriateness of the proposed solution to the problem as presented. Success was further measured by comparison of the solutions produced during the exercise with the detailed response plans described in the AQUAVETPLAN Control Centre Manual.

Day Two – Tactical Exercise Without Troops

Participants were divided into five small teams including producers and their representatives and WA Fisheries staff. Tasks were assigned to the groups so as to develop solutions to a range of practical problems including rapid harvest, stock destruction and disinfection procedures. Discussions of the differences in the plans developed by the five groups were then outlined. Day two was conducted by skilled and experienced staff from the Australian Department of Agriculture, Fisheries and Forestry.

Participants were asked to provide an evaluation following the completion of the exercise to ensure that the program is continuously improved. The outcomes of the exercise were extended across other aquaculture sectors within Australia and Western Australia so that they could also learn from this process. This was achieved by sending a brief summary of the exercise to stakeholders within Western Australia and interstate. A summary of the exercise and its outcomes was presented to yabby producers in March 2004 and an article submitted for publication in newsletters of the Aquaculture Council of Western Australia.

Results/Discussion

The participants of the simulation exercise demonstrated commitment and interest in ensuring that an aquatic animal disease incident was handled professionally and expeditiously. Some issues of concern were the impact on disease control of hobbyists who keep freshwater crayfish, the presence of freshwater crayfish in a multitude of small farm dams and poaching from aquaculture facilities. Despite the potentially catastrophic impact of crayfish plague on native species in the wild, it was difficult to attract representatives from the key conservation agency, the Western Australian Department of Conservation and Land Management, to participate in the simulation exercise.

Benefits

The main benefit of the exercise, as expressed by participants, was the clarification of the events that would occur during a major aquatic animal disease emergency. The importance of the actions and roles of a large number of organisations became apparent during the exercise.

Further Development

The Emergency Response Plan of the DoF is being upgraded as a result of the exercise. In addition, the simulation exercise has resulted in ACWA recognizing the need to plan its role and how the aquaculture industry should communicate during a major disease emergency of this nature.

Outcomes

The outcomes of the project were:

1. Improved farm level awareness of the potential impact of a disease outbreak and the need for improved speed of identification and reporting of disease events in the industry.
2. Improved efficiency of the response, ideally leading to disease control and eradication. This outcome benefits all of aquaculture, as the skills developed are being broadly applied.
3. Reassurance of environmental, wild capture and recreational groups that the freshwater crayfish industry is capable of identifying and helping to manage such a problem.
4. Meeting of an AGDAFF requirement to stage a Disease Emergency Response
5. Capacity building within Government and the industry to appropriately deal with disease emergency response procedures.
6. The updating of the Emergency Management Plan of the DoF.

Conclusion

The importance of establishing a good communication channel such as a website during aquatic disease outbreaks was highlighted during the crayfish plague simulation exercise. The need for personnel from various government departments and representatives of aquaculturists to communicate during disease emergencies was also apparent. Agencies representing the environment and conservation, including the Department of Conservation and Land Management have an important role in disease outbreaks in wild populations of aquatic animals and they need to be encouraged to attend exercises such as Exercise Acheron.

References

Nil

Appendices

Appendix 1: Intellectual property

No intellectual property arose from the project.

Appendix 2: Personnel who attended the simulation exercise

Western Australian participants attending Day 1, the SDCHQ at Forrestfield, Perth

Hillier, Paul	Department of Fisheries, Laboratory Manager, Fish Health Unit
Buller, Nicky	Department of Agriculture, Microbiologist
Clark, Robin	Department of Fisheries, Acting Manager, Pearling and Aquaculture Program
Rose, Tom	Department of Environment, Aquatic Science Unit
Creeper, John	Department of Fisheries, Senior Fish Pathologist
Cridland, Glenn	Department of Fisheries, Manager, Legislation and Drafting Unit
Finlay, Greg	Department of Fisheries, Manager, Central Support, Regional Services
Freeman, Kylie	Department of Fisheries, Fish Health Technical Officer
Leighton, Kim	Health Department., Principal Food Scientist, Environmental Health Service
Machin, Dan	Executive Officer, Aquaculture Council of WA
McLetchie, Heather	Murdoch University, Cray plague diagnostic tool researcher
Nagle, Carey	Marron Growers Association of WA
Myers, Roland	Department of Fisheries, Community Relations
Sampey, Dan	Marron Growers Association of WA
Segers, Gerry	Department of Fisheries, Special Projects
Stephens, Fran	Principal Investigator, Department of Fisheries, Fish Pathologist
Suijdendorp, Preston	Department of Agriculture, Exotic disease policy
Thorne, Tina	Department of Fisheries, Manager, Compliance Programs
Tregonning, Rob	Department of Fisheries, Senior Policy Officer, Environmental assessment policy
Verity, Saskia	Yabby processor

Western Australian participants attending Day 2 at the Department of Agriculture, Manjimup

Representing the Marron Growers Association of Western Australia:

Murray Angus

Sue Bamess

Dennis Bedford

Val Bedford

Carl Cowan

Jeffrey Currie

Bevan Hall

Debbie Hall

Sue Harris

Ray Harris

Grant Horne

Trevor Hulcup

Joel McLure

Steve McLure

Morris Mills

Cliff Mott

John Omedei

Kellie Paterson

Bob Piercey

Geoff Price

Dan Sampey

Jim Turner

Bob Wilson

Jill Wilson

The following participants represented other organisations:

Nicky Buller	Department of Agriculture
Kylie Freeman	Department of Fisheries
Peter Godfrey	Department of Fisheries
Paul Hillier	Department of Fisheries
Peter Lacey	Department of Fisheries
Dan Machin	Aquaculture Council of Western Australia and Yabby Producers Association of Western Australia
Heather McLetchie	Murdoch University
Fran Stephens	Department of Fisheries (Principal Investigator)

Appendix 3: Report on outcomes of Exercise Acheron

A simulation exercise examining the operation of a State Disease Control Headquarters in response to an emergency disease incident in the marron industry. Report prepared by Dr Iain East and Karina Scott, Australian Government Department of Agriculture, Fisheries and Forestry.

Report on the Outcomes of

Exercise Acheron

A simulation exercise examining the operation of a State Disease Control Headquarters in response to an emergency disease incident in the marron industry

March 2004

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Glossary

ACWA	Aquaculture Council of Western Australia
AAHL	Australian Animal Health Laboratory
AFDL	AAHL Fish Diseases Laboratory
AGDAFF	Australian Government Department of Agriculture, Fisheries and Forestry
ANEMIS	Animal Emergency Information System
CCEAD	Consultative Committee on Emergency Animal Diseases
Fisheries – WA	Department of Fisheries, Government of Western Australia
FRDC	Fisheries Research and Development Corporation
LDCC	Local Disease Control Centre
MUP	Minor Use Permit
NGO	Non-Government Organisation
OCVO	Office of the Chief Veterinary Officer
OIE	Office International des Épizooties (World Animal Health Organisation)
PCR	Polymerase Chain Reaction
SAD-EMP	State Animal Diseases - Emergency Management Plan
SDCHQ	State Disease Control Headquarters
WA	Western Australia
WAMFA	Western Australian Marron Farmers Association

Executive Summary

In the past 20 years, many fisheries and aquaculture industries around the world have suffered major production losses through the impact of disease epidemics. To date, Australia has avoided many of these epidemics and retains a favourable disease status, which facilitates international trade and the receipt of premium prices for Australian seafood exports.

The marron industry exports a significant percentage of its production and this export is dependent upon the provision of health certification stating that the product is free from *Aphanomyces astaci* – crayfish plague. Loss of the export trade would place significant pressure on the industry and downward pressure on the market price of marron. In addition, where it occurs, crayfish plague has resulted in virtually 100% mortality in both farmed and wild populations of susceptible species of crayfish.

Exercise Acheron was designed to extend on the previous emergency disease simulation exercise conducted in Western Australia in October 2002 by providing training in emergency management to a wider group of Fisheries WA staff and to members of the marron industry.

The aim of Exercise Acheron was to increase capacity within Fisheries – WA and the WA crayfish industry to appropriately manage emergency disease incidents

The objectives of the simulation were to:

1. To increase participants' knowledge of communication routes to be used in an emergency disease response.
2. To clearly define the roles within and between the various agencies involved and how they fit within the WA Fisheries Emergency/Incident Management Plan and AQUAPLAN Frameworks.
3. To increase participants' understanding of the operational procedures undertaken during the response to an emergency aquatic animal disease.
4. To familiarise participants with operational practices on freshwater crayfish farms of varying production technologies.
5. To identify key areas for improvement in emergency management procedures across a range of subjects including planning, communication, staffing and resourcing.

The simulation was developed over the period from December 2003 to February 2004. The exercise developers were greatly aided in the development of the simulation through the provision of scientific and industry knowledge by Dr Fran Stephens of Fisheries WA and Mr Carey Nagle marron farmer of Reen Rd, Gidgegannup.

The Exercise involved the active participation of Fisheries WA, the WA Departments of Agriculture, Health, and Environment, the WA Marron Farmers Association and the Aquaculture Council of Western Australia.

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Exercise Acheron was successfully conducted on 10-11 February 2004, with 20 Fisheries WA officers participating on the first day and approximately 20 marron farmers and seven Fisheries WA officers participating on the second day.

Evaluation of the outcomes of the exercise and jurisdictional performance and debriefing highlighted that whilst there is a good general awareness of emergency disease management procedures and a good knowledge of the Department of Fisheries (WA) Emergency/ Incident Plan, there exists a number of potential opportunities for improvement or development of the existing systems.

This report makes a number of recommendations that aim to improve pre-existing frameworks and resources in order to develop more robust procedures for management of the response to an emergency disease incident. These recommendations are:

1. Fisheries – WA should provide up to date contact lists to growers through the Marron Growers Association.
2. Both Fisheries – WA and the Marron Industry and their producer organizations should continue to foster closer relations with each other.
3. That the Department of Fisheries Emergency/Incident Management Plan be revised to include details on the roles and responsibilities of other agencies in the response to a disease emergency in fisheries.
4. That discussions be held with the appropriate other agencies to ensure their awareness of their role in fisheries emergencies and to ensure their involvement in future emergency responses and training exercises.
5. That a dedicated website be developed and maintained by industry as an effective form of communication during a disease emergency.
6. That Fisheries – WA conduct a regular program of exercises to maintain staff preparedness for participation in emergency disease responses.
7. That producer organizations investigate the production of a code of conduct or management guidelines that identify weaknesses in biosecurity associated with various farm practices and makes recommendations for best practice in marron and yabby farming.
8. That a paper exercise be conducted by Fisheries – WA in the near future to identify appropriate numbers of staff to be involved in the response to an emergency disease incident, and that this exercise also identify an equivalent number of alternate staff that could take the role of a relieving team if the emergency persists.
9. Future exercises should aim to address the points raised in previous exercises to ensure the ongoing effectiveness of simulation exercises as a training tool.

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Background to Exercise

In the past 20 years, many fisheries and aquaculture industries around the world have suffered major production losses through the impact of disease epidemics. To date, Australia has avoided many of these epidemics and retains a favourable disease status, which facilitates international trade and the receipt of premium prices for Australian seafood exports.

In 1995, a major disease incident resulted in the death of a substantial proportion of the Australian pilchard population. In response, the Federal government conducted several inquiries into the management of aquatic animal health. The subsequent reports (Nairn Report, Report of the National Taskforce on Imported Fish and Fish Products) revealed that Australia's emergency response capability was limited and ad hoc in nature.

The Government's response to these reports lead to the development of AQUAPLAN - Australia's National Strategic Plan for Aquatic Animal Health 1998-2003. AQUAPLAN includes eight programs that address all aspects of aquatic animal health. Program Four - Preparedness and Response focuses on the development of effective institutional arrangements to manage disease emergencies, and within this program, project 4.1.3 focuses on the conduct of simulation exercises to test the capability and capacity of Australia's State/Territory authorities to manage emergency disease incidents. The conduct of these exercises has been ranked as a high priority by Fish Health Management Committee.

The conduct of simulation exercises was ranked as a high priority because the relative absence of emergency disease events in the Australian fishing and aquaculture industries has meant that government staff have had relatively little exposure to emergency management policy and procedures. This program of simulation exercises was in large part made possible by funding provided under the auspices of the Federal Budget Initiative entitled *Building a National Approach to Animal and Plant Health.*

Over the past four years, the Office of the Chief Veterinary Officer (OCVO) within the Australian Government Department of Agriculture, Fisheries and Forestry (AG-DAFF) has conducted a program of simulation exercises designed to enhance the ability of all State/Territory jurisdictions to respond to an emergency disease event. This program has now conducted seven exercises with individual States focussing on particular aquaculture industries within that State and three further exercises with participants from a range of jurisdictions focussing on aspects of management of disease emergencies at a national level.

Whilst this program has provided training to a significant number of government staff and industry members, the marron industry has not previously been included in these exercises. The outbreak of *Thelohania* in the Western Australian yabby industry demonstrated the potential for disease to severely affect the freshwater crayfish industry in Western Australia and raised awareness within the industry of the need for effective disease management strategies. Awareness of the potential impact of disease has been further heightened by the industry's participation in the recent public meetings associated with preparation of the AQUAVETPLAN Disease Strategy Manual for crayfish plague.

The basic scenario for this exercise was a disease event on a fictional marron farm in the Margaret River area. The scenario also involved occurrence of the disease within the adjacent natural waterway. This geographic site (Boodjidup Brook) was chosen because the farm was sited on a small, contained catchment where eradication of the disease (if attempted) may have been a possibility. The occurrence of disease within a wild population in a natural waterway provided the opportunity to investigate the roles and responsibilities of various WA government agencies in the emergency disease response.

The exercise involved Fisheries – WA with participants from the WA Departments of Health, Agriculture and Environment, and industry. This exercise was the next step in involving the marron industry in emergency planning and will add nationally to the outcomes of AQUAPLAN.

The simulation was called *Exercise Acheron* after the River Acheron, one of the five rivers that separate Hades from the world of the living. The name Acheron translates to either the "river of pain" or the "river of woe".

Aims and Objectives of the Exercise

Aim

The aim of this exercise is to increase capacity within the WA fisheries department and the WA crayfish industry to appropriately manage emergency disease incidents.

Objectives

The objectives of this exercise were:

1. To increase participants' knowledge of communication routes to be used in an emergency disease response.
2. To clearly define the roles within and between the various agencies involved and how they fit within the WA Fisheries Emergency/Incident Management Plan and AQUAPLAN frameworks.
3. To increase participants' understanding of the operational procedures undertaken during the response to an emergency aquatic animal disease.
4. To familiarise participants with operational practices on freshwater crayfish farms of varying production technologies.
5. To identify key areas for improvement in emergency management procedures across a range of subjects including planning, communication, staffing and resourcing.

Coordination, Development and Conduct of the Exercise

The simulation was developed over the two-month period from December 2003 to February 2004. FRDC funding under project 2003/671 enabled this exercise to be conducted. More details on the need for the project and its organisation and funding can be found in the project application and final report[1].

In January, Karina Scott of AG-DAFF visited Perth for initial discussions with Fran Stephens of Fisheries – WA and for a familiarisation trip to the Carey Nagle's marron farm at Reen Rd, Gidgegannup. The basic parameters of the exercise were established during that visit. The simulation was subsequently designed by AG-DAFF staff and the associated documentation was developed with the assistance of scientific and industry knowledge provided by Dr Fran Stephens and Mr Carey Nagle. Administrative details and organization within Fisheries – WA were managed by Dr Fran Stephens.

The first day of the exercise was held at the Department of Agriculture's Forestfield offices and commenced at 9am and concluded at 4.30pm. Whilst predominantly designed to involve staff of Fisheries – WA, representatives of the Departments of Agriculture, Health and the Environment were also present. Producers were represented by Dan Sampey, President of the WA Marron Growers Association and Dan Machin and Carey Nagle of ACWA.

During both days of the exercise, officers from AG-DAFF acted as exercise controllers.

To brief participants for the first day of the exercise, each participant received two preliminary documents. Seven days prior to the exercise, participants were issued with the General Instructions document that explained how the exercise would be conducted. On the day prior to the exercise, the participants received the Background Information document that explained the basic scenario and events that had occurred between the first observation of mortalities and the day of the exercise. The Background Information included a range of basic briefing information including:

1. The laboratory report from AFDL;
2. The OIE fact sheet on crayfish plague; and
3. The ANEMIS report including details of the infected premises, its stock and tracing movements from the infected premises

The first day of the exercise commenced with an initial meeting of the State Disease Control Headquarters (SDCHQ) staff at a time immediately after receipt of the laboratory report from AFDL confirming the initial diagnosis of crayfish plague. The second session on the first day represented a subsequent time period shortly after the first meeting where individuals of the SDCHQ team were working in their individual roles. The final session of the first day represented a final SDCHQ meeting 90 days after the initial meeting to discuss long-term disease management strategies for the affected waterways and properties and for the marron industry in general.

[1] *These documents are available on request from Dr Fran Stephens*

Various inputs (documents, phone calls etc) designed to direct the exercise and introduce particular issues were introduced by the exercise controllers throughout the day. All exercise documentation is included in the CD-ROM attached to this report.

The second day of the exercise was held at the Department of Agriculture offices at Manjimup starting at 10am and concluding at 4pm. Approximately 20 marron and yabby producers attended the day together with seven members of Fisheries – WA. The participants were grouped into teams of five and required to take the role of the staff of a marron or yabby farm. During the day, each group addressed a series of questions dealing with biosecurity planning, quarantine, disease eradication and restocking of their farm. The day was divided into two major sessions:

1. When the disease was not present on the group's farm but was present on a farm between 2 and 300 km distant. In this phase, the groups addressed issues of biosecurity planning and preparedness.
2. When the disease was present on their farm and they were required to address issues surrounding destocking, destruction and disposal of infected stock, disinfection and restocking.

Again, various inputs designed to direct the exercise and introduce particular issues were introduced throughout the course of the exercise. Exercise documentation for the second day is also included in the CD-ROM attached to this report.

Debriefing and Evaluation Methods

The aim and objectives of Exercise Acheron are described above. The debriefing and evaluation methods included a range of techniques that were designed to determine whether the aim and objectives of the exercise had been successfully addressed.

Facilitator check-lists

For each session of the exercise, the exercise directors had a checklist detailing a pre-determined list of communications and actions that the exercise directing team had identified as necessary components of the response. The checklists included space to record whether each item was completed, the time at which it was completed and whether the jurisdiction needed prompting to complete the item. The checklists were designed based on the response activities described within the AQUAVETPLAN Control Centres Management Manual.

Formal Debriefing Sessions

In addition to the assessment through the checklists and observations of the exercise directing team, a series of debriefings were held with participants at the conclusion of each session. For the second session on Day 1, the debriefing took the form of a meeting of the SDCHQ that provided individuals the opportunity to report back on progress made and problems encountered.

The debriefing process allowed personal experiences of the participants to be captured and assessed. The debriefing also allowed an assessment of the qualitative performance of activities i.e. their efficacy and efficiency during the exercise.

Participant's report sheets

Prior to the commencement of the exercise, each participant was given a sheet on which they could record comments about the exercise. At the end of the day, the sheets were collected and the comments collated. Most participants however, did not complete these sheets.

Achievements against Objectives

The design of Exercise Acheron identified five formal objectives to be the basis of the exercise. In this assessment of the exercise, the performance of participants was assessed against each of these formal objectives.

Objective 1 - To increase participants' knowledge of communication routes to be used in an emergency disease response.

Prior to the first day of the exercise, none of the participants other than the SDCHQ director had previously participated in either a real disease emergency or a simulation exercise. Despite the majority of the participants working within Fisheries WA, many had not previously met. The SDCHQ controller commenced the first session with a general introduction of each participant and their background. In the second session when individuals worked within specific jobs/roles, the participants became familiar with the structure and organization of the SDCHQ, the lines of communication and the formal chain of command during an emergency disease incident. Beyond the SDCHQ, there was a good awareness that the SDCHQ staff had a need to report to the Department's Chief Executive and the Fisheries Minister.

The use of mini-media releases would allow rapid production and release of information because they do not need approval at the executive level of the department.

On the second day of the exercise, each group of producers correctly identified the need to inform the fisheries department in the event of a mass mortality event. Some groups identified the local fisheries officer or extension officer as an appropriate contact whilst other groups identified the aquatic animal health group in Perth. All of the identified contacts were with a person aware of disease reporting procedures and that thus each group would have either directly or indirectly notified the appropriate WA Fisheries staff.

Recommendations

1. Fisheries – WA should provide up to date contact lists to growers through the Marron Growers Association.
2. Both Fisheries – WA and the Marron Industry and their producer organizations should continue to foster closer relations with each other.

Objective 2 - To clearly define the roles within and between the various agencies involved and how they fit within the WA Fisheries Emergency/Incident Management Plan and AQUAPLAN Frameworks.

Representatives of the WA Departments of Agriculture, Health, and Environment participated in the first day of the exercise. However, because the participants on the first day simulated most of their contacts with other government departments and agencies, there was no conclusive evidence that other responsible departments or agencies are aware of their proposed roles in management of an emergency disease incident in Fisheries. The one exception to this was representatives from the Agriculture Department who had some awareness of the role of their department in emergency disease incidents and the jurisdiction of the Department over fish as "stock animals".

The role of agencies external to Fisheries – WA is not discussed within the Department's Emergency/Incident Management Plan. Neither the initial response list[2] nor the checklist for key players[3] requires the Department to notify other WA agencies. The plan does identify the need to brief other agencies through the use of situation reports but makes no mention of active involvement by these other agencies in the response.

There is scope to learn from other Departments to improve the definition of roles within and between agencies in an emergency aquatic animal disease response. The WA State Animal Diseases Emergency Management Plan (SAD-EMP) explicitly details the roles and responsibilities of agencies external to the Department of Agriculture. The Department of Fisheries Emergency/Incident Management Plan should be expanded to include such a section and/or specific reference to the SAD-EMP and its relevance to emergency disease incidents in fisheries.

The possibility that crayfish plague may have spread to the local waterway would mean that action to kill infected animals in that waterway would need approval from the Australian Government Department of Environment and Heritage under the *Environment Protection and Biodiversity Conservation Act* and would also need approval from the WA Environment Protection Agency. It was recognised that obtaining such approval may require a significant amount of time and any methods of shortening this delay should be investigated.

The second day of the exercise clearly identified a role for producer organisations in the management of disease emergencies. Specifically, the producers expected their organization to provide a constant supply of reliable information to members.

Recommendations

3. That the Department of Fisheries Emergency/Incident Management Plan be revised to include details on the roles and responsibilities of other agencies in the response to a disease emergency in fisheries.

[2] *WA Fisheries Emergency/Incident Management Plan; page 4*
[3] *Ibid; page 9*

4. That discussions be held with the appropriate other agencies to ensure their awareness of their role in fisheries emergencies and to ensure their involvement in future emergency responses and training exercises.

5. That a dedicated website be developed and maintained by industry as an effective form of communication during a disease emergency.

Objective 3 - To increase participants' understanding of the operational procedures undertaken during the response to an emergency aquatic animal disease.

The exercise was most effective in achieving this objective. Approximately 20 members of Fisheries – WA were familiarised with specific roles within the SDCHQ. In addition, each participant was familiarised with the general operation and responsibilities of the SDCHQ. Through the interactions during the exercise and the reporting sessions, each participant was exposed to the range of activities undertaken within a SDCHQ.

On the second day of the exercise, the producers and Fisheries Staff were directly involved in the planning of operational aspects of an emergency disease response. These aspects included the full spectrum of activities including biosecurity, surveillance, movement controls, quarantine, destruction and disposal of infected stock and disinfection of ponds and equipment.

Recommendations

6. That the Fisheries – WA conduct a regular program of exercises to maintain staff preparedness for participation in emergency disease responses.

Objective 4 - To familiarise participants with operational practices on freshwater crayfish farms of varying production technologies.

The farm descriptions provided to the different groups on day 2 were specifically designed to highlight the differences between different types of farming technology used in Western Australia i.e. water sourced from bores vs. rivers, differences in farm layout and operation and management differences including the production of juveniles vs. purchase from a hatchery and self-harvesting vs. use of a commercial harvester.

The major issue identified by producers was the security of the water source. Those farms relying on bore water felt much more secure from the threat of disease compared to those who pumped water from the river. Other differences including soil type and the use of habitat as refuges for the crayfish did not appear to affect the response of producers to a disease threat.

The only other production difference that has highlighted during the second day was the advantage associated with producing juvenile animals on site. The purchase of juveniles from another farm was seen as a possible route for introduction of disease and should be avoided where possible.

Each of the groups tended to take a "best practice" and a maximum response approach to news of disease on another farm, even if the infected farm was over 300km away and in a different catchment area. Whether this would reflect reality during a real disease emergency is uncertain.

Recommendations

7. That producer organizations investigate the production of a code of conduct or management guidelines that identify weaknesses in biosecurity associated with various farm practices and makes recommendations for best practice in marron and yabby farming.

Objective 5 - To identify key areas for improvement in emergency management procedures across a range of subjects including planning, communication, staffing and resourcing.

The performance of Fisheries – WA staff during the exercise did not highlight any particular areas of emergency disease management that required urgent attention. Overall, the participants identified all major management issues and conducted an efficient response to the given scenario. However, informal discussions with participants during the exercise did identify the issue of human resources as a potential limitation to the response.

Even if the disease was confined to a small area, the number of people required to provide 24 hour movement control would be large. The additional load associated with identification of local stocks of marron in artificial water bodies (dams, ponds etc) through a door knock campaign would also require a substantial number of people. There was no recognition of where such numbers of people would be sourced. In addition, a second group of staff would be needed to relieve the first group if the response lasted longer than a few days.

Participants also felt that real life experience had shown that there was insufficient consideration of the need to postpone or transfer normal duties to concentrate on the emergency disease management. A scheme for staff resource planning is necessary to ensure that routine duties are managed whilst staff are involved in an emergency disease incident.

A significant number of the fish health laboratory staff were involved in the exercise. Whilst this is good as a training opportunity, during a real disease emergency, these staff would be required in the laboratory and SDCHQ staff would need to sourced elsewhere.

The exercise also highlighted that very few fisheries officers are registered to act as stock inspectors. This constrains the fisheries officers from acting under the legislation such as the Exotic Diseases of Animals Act 1993 and the Stock Diseases (Regulations) Act 1968-1978 and their associated Regulations. If the Department of Fisheries plans to continue to utilise these acts during emergency disease incidents in fisheries, then Fisheries Officers should routinely become Stock Inspectors when they commence employment.

Recommendations

8. That a paper exercise be conducted by the Fisheries – WA in the near future to identify appropriate numbers of staff to be involved in the response to an emergency disease incident, and that this exercise also identify an equivalent number of alternate staff that could take the role of a relieving team if the emergency persists.
9. The appointment of additional Fisheries Officers as Stock Inspectors should be investigated.

General Observations

General observation of participants' activities highlighted several issues that are not directly related/linked to the exercise objectives. While they are not listed here as formal recommendations, addressing these issues could improve the management of emergency disease responses.

Day 1

The first day commenced with an initial meeting of the State Disease Control Headquarters (SDCHQ) to review the confirmatory laboratory results and to plan a response to the emergency disease incident. The success/effectiveness of the meeting was assessed against a checklist prepared from the AQUAVETPLAN Control Centres Manual. A number of deficiencies were identified including the failure to take minutes of the meeting and the lack of an agenda. More importantly, the group failed to discuss or establish a control strategy to manage the disease incursion.

The second session on the first day was the major component of the exercise and involved the participants working as either individuals or in small teams to address specific aspects of the emergency response in the area of their expertise. At the end of the session, the team held an impromptu meeting for individuals to report back to the entire group. Overall, all the tasks were tackled well. Issues arising during this phase included:

1. There was no recognition that the current Minor Use Permit (MUP) for esfenvalerate held by the Fisheries – WA could not be used to allow the use of esfenvalerate to kill infected marron. The permit is specific for use with yabbies and recent experience has recently shown that it is not easy/possible to extend the existing MUP to use esfenvalerate to control redclaw. It should not be expected that a MUP could be rapidly obtained for use with marron.
2. The AQUAVETPLAN Disease Strategy Manual for crayfish plague was not consulted. The value of pre-existing plans should be recognised and the plans utilised.

The final session for the day represented the final meeting of the SDCHQ at a time point ninety days after the initial meeting. The aim of the meeting was to establish what further action was necessary after the destocking and disinfection of the two infected farms. A situation report and an agenda were provided to the participants. An on-going monitoring scheme was discussed, as was the need for continued strict bans on recreational fishing access to the affected waterways.

3. Questions were raised as to the adequacy of the current regime of export testing and the requirement to only test three crayfish per batch. It was recognised that significant extra costs would be associated with expansion of the crayfish plague testing program.

4. In the absence of any formal compensation mechanisms, industry participants recognised the need for affected producers to have access to some form of compensation. One suggestion was the possibility of an ex gratia payment by the minister. A more certain form of financial assistance for producers would be a major advantage.

More general observations that were made over the day included:

5. There needs to be a greater awareness of the range of legislation available for health management and which Act is the most appropriate to use in each circumstance.

6. Whilst commercial marron and yabby growers are registered and details of the properties are kept by the Department of Agriculture together with a library of aerial photos, hobbyists are a major concern to the industry because they are untraceable and their properties are not readily identifiable. During an emergency, disease management would require a door knock to identify all populations of freshwater crustaceans in an affected area. This would be very labour intensive.

7. The presence of wild populations of freshwater crayfish would mean that during surveillance activities or disease eradication, all bodies of water would need to be identified and examined to ensure that unidentified populations of infected stock do not persist in the environment.

Day 2

The involvement and enthusiasm of the marron producers was generally pleasing. The responses to the problems posed demonstrated that each group had a depth of knowledge in the area of farm biosecurity and that they were aware of what was current best practice for disease management in their industry. Issues that were raised during the day that require further attention are:

1. The marron industry would suffer from the economic impacts of emergency disease management at an early stage. The financial impacts of additional Biosecurity measures, loss of sales etc would be felt almost immediately.

2. The proposal that producers could assist in surveillance work by trapping wild marron in local creeks would remove pressure from Fisheries department staff. However,

changes would need to be made to the *Fisheries Management Act* to allow the producers to trap wild marron out of season during a surveillance program.

3. Technical experts indicated that incoming water would need to be filtered down to 5 micron to remove crayfish plague spores. Investigations should be made to determine whether filtering down to this level is cost effective in the marron industry.

4. The ability to cook marron on farm during an emergency disease incident would allow the continued sale of stock without the fear of spreading disease. Investigations should be made to determine the feasibility of either permanent arrangements to allow on-farm cooking or special arrangements that can be rapidly activated during an emergency disease incident.

5. Low-cost and no-cost management changes that can improve on-farm health monitoring were identified and included:

    - Adjustment of feeding time to allow easy observation of stock;
    - Removal of some stock to a small aquarium in a convenient location to allow ready and constant monitoring; and
    - Observing stock on a greater number of occasions per day.

    These suggestions need to be captured in a code of conduct or farm management plan.

6. During an emergency disease event, producers need to have a communication strategy that includes an identified Fisheries – WA spokesperson and a major role for the industry association. Many producers indicated that a dedicated website organised and maintained by industry rather than government would be an effective form of communication during a disease emergency.

7. Poaching was highlighted by several growers as a problem and potential method of spreading disease. There are currently no effective methods for control of poaching.

8. Disease management would be made easier by the provision of detailed information on issues such as suitable chemicals, dosages, operating procedures, OHS aspects etc. Industry members suggested that the Fisheries – WA should make such information available to producers.

Evaluation of Exercise Structure

Exercise participants were asked to evaluate and provide feedback on the structure of Exercise Acheron. Issues raised during the feedback session included:

- One of the participants' feedback sheets suggested that participants should have been assigned to a specific role within the SDCHQ prior to the exercise so that they could familiarise themselves with the requirements of the role. Such an action may have ensured a more comprehensive discussion of issues because the participants would have been aware of their areas of responsibility and thus ensured that matters affecting their area were discussed. While the WA Fisheries Emergency/ Incident Plan contains brief role descriptions, it is not a complete list of the roles and responsibilities of SDCHQ officers. These descriptions should be further developed to provide more guidance to SDCHQ officers. The revision could draw from AQUAVETPLAN and WESTPLAN to provide harmony across agencies and jurisdictions.
- Participants felt that reporting points built into the exercise (or meeting) timetable may have prompted SDCHQ members to give regular updates to the group, and may have facilitated decision making.
- Industry members involved in day one of the exercise commented that they had received more information during the exercise than they would expect to receive at that time in a real response. They attributed this to their close spatial proximity to the government members of the SDCHQ, and recommended that placing industry representatives in a separate room for the exercise may give a more realistic representation of activity/communication during a response.
- Participants commented that "it was easy" to communicate between groups due to everyone being located in the one room, and that separating the groups may provide a more realistic representation of inter/intra-agency communication during a response.
- An exercise involving real time e-mail traffic like the recent Exercise Tethys was felt to be more realistic than this exercise's introduction of information via phone messages and pieces of paper.
- Participants commented that while the introduced questions from the media placed some level of pressure on staff, that the introduction/inclusion of Parliamentary questions would not only place more pressure on staff but also add an element of realism to the exercise.
- Whilst staff were confident that incidental issues could be readily passed to other staff within the department or to other agencies, the exercise did not determine whether this could be done so easily in a real situation.

- There was a problem over timing during the second session of the first day's exercise. Some participants were working in real time and completing a single or small group of tasks where the parameters did not change. However others such as the tracing and epidemiology groups were working in an accelerated time frame that may have represented a total of three to five days. Participants suggested that it would have been good to have positive diagnosis at the start of the first session (day one) and then move to day 15 in the second session with confirmation from second/third infected properties.

Recommendations

10. The WA Fisheries Emergency/Incident Management Plan should be revised to include more detailed descriptions of the roles and responsibilities of SDCHQ (or equivalent) officers.

11. Future exercises should aim to address the points raised in previous exercises to ensure the ongoing effectiveness of simulation exercises as a training tool.

Conclusions

The exercise resulted in 20 members of Fisheries – WA and 20 members of the marron and yabby industries being introduced to the various components of and roles within the emergency disease management system. The exercise demonstrated that the participating government staff and industry members had a good knowledge of disease management procedures. Awareness of best practice for on farm management among industry members was particularly good.

The exercise also served to foster/establish a working relationship between government agencies that would be involved in the response to an emergency aquatic animal disease incident, and in doing so raised the awareness of government officers to the roles and responsibilities of each agency and the working of a multi-jurisdictional response.

In the same manner, the exercise not only introduced industry members to the emergency management framework, but also worked to foster a working relationship between Fisheries – WA and industry associations. Government officers who attended the second day gained a greater understanding of the marron and yabby industries, the operational practices on freshwater crayfish farms of varying production technologies and how these variables affect the technical aspects of an emergency animal disease response (eg collection and submission of samples).

A number of minor issues were identified during the exercise that, if addressed, would assist in the effective management of emergency disease incidents. These issues are addressed in the recommendations made within this report.

Recommendations

The recommendations of the report are repeated here as a consolidated list.

1. Fisheries – WA should provide up to date contact lists to growers through the Marron Growers Association.
2. Both Fisheries – WA and the marron industry and their producer organizations should continue to foster closer relations with each other.
3. That the Department of Fisheries Emergency/Incident Management Plan be revised to include details on the roles and responsibilities of other agencies in the response to a disease emergency in fisheries.
4. That discussions be held with the appropriate other agencies to ensure their awareness of their role in fisheries emergencies and to ensure their involvement in future emergency responses and training exercises.
5. That a dedicated website be developed and maintained by industry as an effective form of communication during a disease emergency.
6. That Fisheries – WA conduct a regular program of exercises to maintain staff preparedness for participation in emergency disease responses.
7. That producer organizations investigate the production of a code of conduct or management guidelines that identify weaknesses in biosecurity associated with various farm practices and makes recommendations for best practice in marron and yabby farming.
8. That a paper exercise be conducted by the Fisheries – WA in the near future to identify appropriate numbers of staff to be involved in the response to an emergency disease incident, and that this exercise also identify an equivalent number of alternate staff that could take the role of a relieving team if the emergency persists.
9. The WA Fisheries Emergency/Incident Management Plan should be revised to include more detailed descriptions of the roles and responsibilities of SDCHQ (or equivalent) officers.
10. Future exercises should aim to address the points raised in previous exercises to ensure the ongoing effectiveness of simulation exercises as a training tool.

Acknowledgments

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The Exercise Controllers would like to thank Fran Stephens of Fisheries – WA for her tireless efforts in organising the exercise and Dan Machin and Dan Sampey for providing industry support to the exercise. The design of the exercise was greatly aided by the provision of information by Fran Stephens of Fisheries – WA and Carey Nagle, marron farmer of Reen Rd, Gidgegannup.

Appendix 4: Media Alert and Release

Media Alert

Department of Fisheries

10 February 2004 17/04

MOCK FRESHWATER CRAY PLAGUE

What: Tomorrow is the second day of a simulated emergency exercise in which the WA marron industry is hit by a freshwater crayfish plague.

Exercise "Acheron" is designed to increase the capacity between the Federal Department of Agriculture, Forestry and Fisheries, the WA Department of Fisheries and WA marron growers to respond to and manage emergency disease incidents.

Where: Manjimup Horticultural Research Institute
South West Highway, Jardee Via Manjimup
(Head south on the South West Highway, pass the turn off to Jardee then look for the turn on the left hand side. The location is well signposted)

When: Wednesday, 11 February 2004
From 10 am

Media Contacts

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Web Site: http:/ www.fish.wa.gov.au

Fish for the future

Media Release

11 February 2004 **11/04**

Department of Fisheries

SIMULATED MARRON "PLAGUE" STRIKES

A simulated emergency of a severe outbreak of freshwater crayfish plague struck the local marron industry in a scenario being played out yesterday in Perth and today in Manjimup.

The exercise, code-named "Acheron", is being run following a request by the WA Marron Growers' Association to the Federal Department of Agriculture, Fisheries and Forestry and the WA Department of Fisheries.

Fish Pathologist with the WA Fisheries Department, Dr Fran Stephens, said the aim of the simulated plague outbreak was to give both federal and state departments and the marron industry a greater ability to respond to and manage any real disease incidents that may occur.

"Yesterday, the exercise simulated a control centre with participants going through the process of decision-making that would be expected during the early stages of a real outbreak of freshwater crayfish plague," Dr Stephens said.

"Such an exercise will help identify any deficiencies or problems which may surface during a real outbreak.

"Freshwater crayfish plague does not occur in Australia, but if it did enter Australian waters, large numbers of freshwater crayfish and marron would be killed. This particular disease has had a terrible effect on European species of freshwater crayfish."

"Industry awareness of the potential impact of disease on the industry has been raised in public meetings associated with preparation of the freshwater crayfish plague disease strategy manual," she said.

"It's estimated the commercial marron industry generates more than a million dollars a year to the WA economy and as such is a valuable asset. Exercise "Acheron" will help ensure that in the unlikely event of a real outbreak, that industry will be protected."

Exercise "Acheron" is funded by the Federal Research and Development Corporation.

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Fish for the future

Media Release

Department of Fisheries

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