FINAL REPORT

Aquatic Animal Health Subprogram: development of a database for Australian laboratory diagnostic expertise for diseases of aquatic organisms

I.J East

March 2004

FRDC Project 2003/647

Australian Government
Department of Agriculture, Fisheries and Forestry

Australian Government
Fisheries Research and Development Corporation

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Aquatic Animal Health Subprogram: development of a database for Australian laboratory diagnostic expertise for diseases of aquatic organisms

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NON-TECHNICAL SUMMARY

2003/647 Aquatic Animal Health Subprogram: development of a database for Australian laboratory diagnostic expertise for diseases of aquatic organisms

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OBJECTIVES:

1. To develop a readily accessible and easy to use database that provides information on the location of diagnostic laboratories, their capability and capacity in the diagnosis of a range of pathogens and disease conditions.

NON TECHNICAL SUMMARY:

OUTCOMES ACHIEVED TO DATE

The diagnostics database has been successfully designed, populated and is operational on the Australian Government Department of Agriculture, Fisheries and Forestry (AG DAFF) website. Two rounds of stakeholder consultation and trial operation of the database ensured that the database incorporated all the features requested by potential users. The database includes data on 10 laboratories, 70 pathogens and 16 types of diagnostic test. The database can be searched by laboratory, pathogen, type of test or a combination of these variables. The contents of the database have been updated to incorporate the results of an informal review of the molecular diagnostic capability of the various laboratories held in January 2004.

The basis of this project was the design of a database to centralise the available information on diagnostic capability and capacity of the various aquatic animal health laboratories in Australia.

Historically, aquaculture in Australia has been managed at the State/Territory government level with the various State/Territory Departments of Fisheries or Primary Industries providing health services. Logically, each jurisdiction has developed expertise primarily focussed on the aquaculture industries present in that jurisdiction and this approach has been reinforced by limitations on resources within each jurisdiction. The Australian Government has provided further support through funding the establishment and operation of the Australian Animal Health Laboratory that incorporates the Fish Diseases Laboratory. Additional diagnostic expertise exists at a range of laboratories within universities, CSIRO and other institutions. There is however, no centralised register of this expertise or coordinated approach to sharing of diagnostic expertise.

In recent times, moves have been made to establish a formal network of the existing laboratories to share expertise and assist with issues such as the training of staff. The first step in establishing this network is to determine and document the existing range of

diagnostic expertise within Australian laboratories, and then make that information available to the relevant stakeholders in government and industry. The provision of this information will also have significant flow-on effects. When a diagnostic laboratory needs to source assistance with a diagnosis, it is critical that time is not wasted trying to identify an appropriate laboratory or sending samples to the wrong laboratory. A rapid diagnosis is also a key component of a rapid response to an emergency disease incident.

The main aims of this project were to:

- facilitate the rapid diagnosis of disease of aquatic animals within Australia, and therefore
- ensure a rapid response to any potential emergency disease incidents.

The primary output of the project was the diagnostic database. The aim of the project was achieved in that the database provides the necessary information to identify suitable laboratories with the capability to diagnose the suspected disease. The database is rapid and easy to use and has been well received by both Government and industry stakeholders.

KEYWORDS: **Diagnostic techniques, laboratories, pathogens, database**

Acknowledgments

The authors wish to thank the representatives of the State and Territory Departments of Fisheries and Departments of Primary Industries who participated in the two rounds of stakeholder consultation to review the database and make suggestions for its improvement. The authors also wish to thank David Green and Scott Wiencke of the Australian Government – Department of Agriculture, Fisheries and Forestry's Internet Development Team for designing and implementing the database.

Background

The capability to diagnose infection in aquatic animals is dispersed widely throughout a range of laboratories within Australia. In general, each State/Territory maintains a diagnostic laboratory with a range of diagnostic capability, generally targeted at the pathogens of the aquatic animal species cultured in that State. In addition, the Fish Diseases Laboratory within the Australian Animal Health Laboratory is supported by the Australian Government to provide a diagnostic service for the diagnosis of potential and actual exotic disease incursions.

In addition to these dedicated laboratories, there is a range of specialist diagnostic capability that is available in university, CSIRO and other laboratories. There is currently however, no central registry or listing of the laboratories, their capabilities or capacity. In addition, there is no central record of laboratory accreditation.

A preliminary survey of diagnostic capability of Australian laboratories was completed in 2001 and subsequently updated in 2002. This information is currently stored as a word document within the Aquatic Animal Health unit within the Australian Government – Department of Agriculture, Fisheries and Forestry. This information is not readily accessible in this format and does not include all the information listed above.

Need

During emergency disease incidents, rapid diagnosis of the pathogen involved is critical to mounting an effective response. Because each laboratory does not have a complete range of diagnostic capability, often a specialist laboratory needs to be identified to assist in the diagnosis. Currently, there is no database of laboratories and their diagnostic capabilities. Identification of alternative laboratories is done on an ad hoc basis and, often when the information is required rapidly, the best alternative laboratory is not identified.

In recent times there have been actual examples of diagnosis being delayed by samples being sent to an inappropriate laboratory. This project will result in a readily accessible database with an up to the minute listing of laboratories, their diagnostic capabilities and capacities, the range of techniques that they have available to diagnose each pathogen and their level of accreditation.

In Australia, each aquatic animal health laboratory has limited resources and it is not cost-effective to have all the laboratories develop the full range of diagnostic capability. However, it is not desirable to send samples to an overseas laboratory especially in the case of a suspect exotic disease. The solution to this resource dilemma is to create a network of diagnostic laboratories within Australia. The first step in achieving this network is to conduct

a stock take of current capability and capacity and subsequently make the information available to all stakeholders.

Objectives

1. To develop a readily accessible and easy to use database that provides information on the location of diagnostic laboratories, their capability and capacity in the diagnosis of a range of pathogens and disease conditions.

Methods

Initially, it was the intention of the Principal Investigator to retain a consultant with extensive experience in the design and construction of web-based, interrogatable databases to build the database. However, representatives of AG-DAFF's Internet Development Team indicated that they would be unwilling to allow a consultant access to the department's website. Given this difficulty, it was decided to use the services of the AG-DAFF Internet Development Team to design the database.

Detailed specifications for the database were developed in consultation with the Subprogram's Steering Committee and Scientific Advisory Committee prior to developing the Terms of Reference for the design team. The design reflected the needs of diagnostic laboratories within Australia and the initial prototype database was reviewed and trialed by a panel of likely users prior to completion of the final design. Due to the extensive changes made to the database after the first stakeholder review, it was subject to an unplanned second round of review by stakeholders to allow consideration of the changes made to the initial prototype database.

After incorporation of the stakeholder comments arising from the second review process, the completed database was made publicly available on the AG-DAFF website at http://www.affa.gov.au/content/forms/fishdiagnostic/search.cfm

Results/Discussion

The final design includes information for 10 laboratories, 70 pathogens and 16 types of diagnostic test. The database can be searched by laboratory, pathogen or test or by a combination of the three variables. When the search results are returned, the database also indicates whether the selected test is NATA certified in that laboratory, fully validated or only an in-house method. The database also provides:

1. brief descriptions of each laboratory including contact details and any NATA accreditation.
2. brief description of each diagnostic test type
3. a short list of links to other web pages that provide information on the pathogens and diagnostic methods.

The completed database can be found at http://www.affa.gov.au/content/forms/fishdiagnostic/search.cfm and is available for use by the general public.

The database has an administrative area that is only available by password and access to this area is only available to the database administrator. The administrator is responsible for updating the database as new information becomes available.

Further Development

The most logical area of further development is the maintenance of the database to ensure that the information is accurate and up-to-date. This maintenance will be managed by the database administrator within AG-DAFF. Annual review of the database contents by representatives of the various laboratories will ensure the accuracy of the database.

Planned outcomes

The planned outcome of this project was:

1. the enhanced and more rapid diagnosis of the cause of infectious disease within aquatic animals within Australia. This will be of major benefit because rapid diagnosis is a key component of an effective response to outbreaks of disease within aquaculture and fisheries. Early diagnosis increases the chance that an incursion of an emergency disease can be contained.

The output of the project was the database of diagnostic capability for pathogens of aquatic animals. The availability of this database should remove any uncertainty as to which laboratories have the capability to diagnose each of the wide range of aquatic animal pathogens. The provision of laboratory contact details should also minimise any delay in identifying the appropriate contacts and arranging for submission of samples.

Conclusion

The objective of the project was:

1. To develop a readily accessible and easy to use database that provides information on the location of diagnostic laboratories, their capability and capacity in the diagnosis of a range of pathogens and disease conditions.

The objective was clearly achieved. The database has been designed activated and is publicly available on the AG-DAFF website at http://www.affa.gov.au/content/forms/fishdiagnostic/search.cfm

APPENDIX 1: INTELLECTUAL PROPERTY

This project has not developed any intellectual property that requires legal protection. The nature of the output of this project is a database containing information on Australian laboratories and their diagnostic capabilities. The database was produced with commercial software.

APPENDIX 2: STAFF

Principal Investigator	Iain East
Database Designer	David Green
Database Designer	Scott Weincke