

A Bibliography of FRDC and CRC Aquaculture Environmental Research Reports and Related Publications (FRDC 2011/525)

Final Report

August 2014



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Project No: FRDC 2011/525

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

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1 Non-Technical Summary

2011/25: A Bibliography of FRDC and CRC Aquaculture Environmental Research Reports and Related Publications.

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OBJECTIVES

The project objectives were to:

1. Source and collate a bibliography and soft copies (where possible) of reports and associated publications from all relevant environmental projects funded by FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture.
2. Liaise with FRDC and other stakeholders regarding appropriate publications.
3. Enter this information into a bibliographic software library (e.g. EndNote) that allows searching (including Keywords) and export to easily accessible formats like MS Word and Excel.
4. Provide the final report, database, exported versions and available soft copies to FRDC as electronic files, as well as in usual reporting formats.

OUTCOMES ACHIEVED TO DATE

The project outputs have contributed to, or will lead to, the following outcomes:

- improved knowledge within the Australian aquaculture industry and among fisheries researchers regarding key environmental reports published by the FRDC, AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture, (noting that this was expanded to include related literature as identified during the course of compilation); and,
- an accessible environmental aquaculture bibliographic database¹ that will contribute to national efforts to maintain and build the Australian seafood industry's social license to operate.

¹ See FRDC website www.frdc.com.au or https://www.zotero.org/groups/frdc_enviro_bib/items

NON-TECHNICAL SUMMARY

Aquaculture and commercial fishing activities are under increasing scrutiny from consumers, non-government organisations (NGOs) and the media. The sustainability of some activities associated with the seafood industry is questioned both nationally and internationally.

The FRDC and industry are therefore working to increase community awareness of industry sustainability practices and, through this, support for the seafood industry.

This project was initiated through discussions between the FRDC and the National Aquaculture Council (NAC) in 2011, with RDS Partners being engaged to work with this team in 2012.

The original objectives of the project were modified to focus the project on the production of an accessible and comprehensive bibliographic database of reports and associated publications from all relevant environmental projects funded by the FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture.

The database is a publically available source of bibliographic information² demonstrating the current depth and breadth of relevant scientific research published in Australia (with some relevant overseas examples) regarding natural environmental issues associated with tuna, prawn, salmon and edible oyster aquaculture. The database was expanded to include important papers relating to those that were the result of FRDC/AquaFin CRC/Seafood CRC funding.

This bibliography will assist industry, researchers, NGOs and the general public to increase their awareness of the current state of knowledge and research questions regarding environmental issues associated with aquaculture in Australia.

Through improved knowledge and awareness, all stakeholders will better understand sustainability issues associated with tuna, prawn, salmon and edible oyster aquaculture in Australia.

KEYWORDS: tuna, prawn, salmon, oyster, aquaculture, Australia, sustainability, environmental bibliography.

² See FRDC website www.frdc.com.au or https://www.zotero.org/groups/frdc_enviro_bib/items

2 Acknowledgements

This report was funded by the Fisheries Research and Development Corporation (FRDC) as part of project number 2011/525 *A Bibliography of FRDC and CRC Aquaculture Environmental Research Reports and Related Publications*.

The FRDC is Australia's leading agency concerned with planning, investing in, and managing fisheries research, development and extension.

The FRDC is a statutory corporation founded in 1991 under the Primary Industries and Energy Research and Development (PIERD) Act 1989. It is responsible to the Minister for Agriculture Fisheries and Forestry.

The FRDC's mission is to maximise economic, environmental and social benefits for its stakeholders through effective investment and partnership in research, development and extension.

The project was managed by Pheroze Jungalwalla (Chair, National Aquaculture Council) and Patrick Hone (Executive Director, FRDC).

RDS Partners was engaged to undertake this project and produce the final report.

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3 Background

In 2011, the National Aquaculture Council (NAC) and the Fisheries Research and Development Corporation (FRDC) agreed to support a project to provide a synopsis of Australian research and other publications relating to the environmental practices of the Australian aquaculture industry. RDS Partners was engaged to work with this team in 2012.

4 Need

This project was founded on the observation that aquaculture and commercial fishing activities are under increasing scrutiny from consumers, NGOs and the media and that the sustainability of some activities associated with the seafood industry has been questioned.

A recent survey prepared for the FRDC³ indicated that 78% of the Australian community believed fish farming to be sustainable whereas only 27% of the community believed commercial fishing to be sustainable.

Industry opinion was that community support for aquaculture could potentially be further improved if the public can access research regarding efforts being made to understand and manage sustainability issues.

This project was designed to collate environmental research reports and associated publications from all relevant projects funded by FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture into an accessible electronic database.

The project supports FRDC aims to inform community perceptions by providing factual information for consumers, markets and other stakeholders interested in sustainability issues associated with the seafood industry in Australia.

The project was developed to contribute to national efforts to maintain and build the 'social license' of the Australian seafood industry.

³ frdc.com.au/research/Documents/Info%20for%20Researchers/Community_perceptions_of_the_fishing_industry_in_Australia_-_2011.pdf

5 Objectives

The project was established with four main objectives.

1. Source and collate a bibliography and soft copies (where possible) of reports and associated publications from all relevant environmental projects funded by FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture.
2. Liaise with FRDC and other stakeholders regarding appropriate publications.
3. Enter this information into a bibliographic software library (e.g. EndNote) that allows searching (including Keywords) and export to easily accessible formats like MS Word and Excel.
4. Provide the final report, database, exported versions and available soft copies to FRDC as electronic files, as well as in usual reporting formats.

6 Methods

To compile a bibliography (including soft copies where possible) of reports and associated publications from all relevant environmental projects funded by FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture, the following methodology was employed.

- Liaise with FRDC and other stakeholders (e.g. past AquaFin CRC members, Australian Seafood CRC) regarding appropriate publications, requesting an electronic list of all projects funded since 2000 (noting that highly relevant projects funded before this date were also to be considered).
- Development of a project list and corresponding report publication list.
- Determination of which projects/reports and publications met the criteria of “relevant environmental projects with regard to tuna, prawn, salmon and edible oyster aquaculture”. FRDC was consulted to confirm that this list met project objectives.
- FRDC and AquaFin and Australian Seafood CRC requests then complemented by extensive database searches via internet⁴.
- Personal communications with selected researchers.
- Enter publications into EndNote to allow efficient searching (including keywords) and export to easily accessible formats (MS Word and Excel).
- Submit a draft report including the bibliographic database to FRDC for review.
- Revise database, including importing the EndNote database into a Zotero database, and report where necessary and present the final report to FRDC.

⁴ Literature search methodology included using databases such as [FRDC Final Reports Search](#), [Google Scholar](#), [Web of Knowledge](#) (via UTAS database), and [Scirus](#). Key words used regarding, for example, Oysters, included: Oyster AND Aquaculture, Australia Oyster AND Farming, Australia Oyster AND Environment, FRDC AND Oysters, CRC AND Oysters. Key authors of relevant FRDC publications were then searched (e.g. Oysters Crawford; Macleod; Mitchell; Rubio; Lawrence; O'Connor).

7 Results/Discussion

The EndNote database has been provided to FRDC with this report. As a flexible database, it can be used both electronically and in the production of hard copy data.

Appendix 3 presents a complete list of references that have been entered into the database.

Note that there are many different ways (or styles) that the reference list shown in Appendix 3 could be presented: this is only one example. Keyword searches will produce targeted lists that focus on specific components of interest.

The MS Excel output has been designed to allow sorting and filtering of the reports and articles within the database. Keywords have been included in this output along with FRDC report numbers and AquaFin and Seafood CRC report numbers, where relevant.

Each reference entered into the database includes keywords relevant to the focus of that report as well as linking the report to a species, region (state, Australia or global) and, if applicable, to the FRDC (for reports published by the FRDC).

The EndNote database was also imported into a Zotero database to increase the public accessibility of the bibliographic information.

See https://www.zotero.org/groups/frdc_enviro_bib/items

8 Benefits

The availability of a comprehensive and easily accessible database⁵ of relevant environmental projects funded by FRDC and the AquaFin and Seafood CRCs with regard to tuna, prawn, salmon and edible oyster aquaculture will assist stakeholders to identify and understand the diversity of environmental issues that industry has been and is addressing. The publications in the database focus on those since the year 2000, but prior publications identified during consultation to be of particular relevance also have been included.

Benefits of this project are expected to accrue not only to the aquaculture industry (and commercial fishing by association) but also to NGOs, scientists and the other stakeholders interested in sustainability issues associated with aquaculture in Australia.

The database will provide researchers with an easily accessible, practical and updatable tool regarding relevant environmental publications associated with tuna, prawn, salmon and edible oyster aquaculture.

Overall, the project is expected to assist Australia's aquaculture industry to better communicate sustainability issues to stakeholders and to assist in efforts to build its social license to operate.

⁵ See FRDC website www.frdc.com.au or https://www.zotero.org/groups/frdc_enviro_bib/items

9 Further Development

Activities and other steps that will be undertaken to further develop or disseminate the results of this project include:

- notification of publication of this final report on industry web sites (e.g. for oyster stakeholders: Oysters Australia Industry Blog⁶, Oysters Tasmania⁷, SA Oysters Growers Association⁸, NSW Farmers⁹) and relevant industry newsletters;
- email notification to industry and government networks of final report publication and availability; and,
- media release following publication of final report (if deemed appropriate by FRDC).

Original data generated during the project will be stored by RDS Partners in electronic formats.

Should there be any errors in or omissions from the database, please contact RDS Partners and we will update the outputs and forward to FRDC.

⁶ <http://oystersaustraliablog.org.au/>

⁷ <http://www.oysterstasmania.org/>

⁸ <http://www.oystersa.com.au/south-australian-oyster-growers-association>

⁹ <http://www.nswfarmers.org.au/>

10 Planned Outcomes

The project's outputs will contribute to the planned outcomes as follows.

The final published bibliographic database will assist researchers, NGOs and the general public to access and gain a greater understanding of the range of aquaculture-related sustainability research questions being addressed by Australian scientists, government and industry. It is anticipated this shared understanding will assist Australia's aquaculture industry to better engage stakeholders in sustainability-related discussions.

11 Conclusion

This project stems from the aquaculture industry's and the FRDC's perception that better tools are needed to communicate industry's achievements in addressing key environmental issues associated with tuna, prawn, salmon and edible oyster aquaculture to the general public and other stakeholders.

By more effectively communicating the types of research that have been undertaken to address environmental sustainability issues, industry seeks to engage more fully with relevant communities-of-interest.

With the completion of this aquaculture environmental bibliography, the stated aim of producing a useful and accessible communication tool from which stakeholders can source information¹⁰ has been achieved.

Community awareness of research outputs and outcomes, especially where industry has addressed key environmental issues, will benefit industry in terms of community perception and support for ongoing activities.

This database will assist in the identification of opportunities for future research as well as communicating key aspects of that research to the general community.

It should be noted that this project has focused only on *environmental* literature relevant to tuna, prawn, salmon and edible oyster aquaculture. An equivalent *social* and *economic* database would be required to more comprehensively address the other key aspects of sustainability¹¹.

¹⁰ See FRDC website www.frdc.com.au or https://www.zotero.org/groups/frdc_enviro_bib/items

¹¹ While there is no one universally agreed definition of 'sustainability', many of the definitions make reference to the interconnections between economy, society and the environment, or 'triple bottom line'.

Appendix 1: Intellectual Property

The research is for the public domain. The report and any resulting manuscripts are intended for wide dissemination and promotion. All data and statistics presented conform to confidentiality arrangements.

Appendix 2: Staff

Staff and individuals involved in and consulted during this project include:

- Tom Lewis, RDS Partners
- Ray Murphy, RDS Partners
- Don Defenderfer, RDS Partners
- Morag Anderson, RDS Partners
- Pheroze Jungalwalla, Chair, National Aquaculture Council

We would like to offer special thanks to aquaculture industry representatives, and FRDC staff who helped frame the development and final outputs of this project.

Appendix 3: Aquaculture Environmental Bibliography

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