FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

Final report

Development of a national sector-specific biosecurity plan guideline and template for the sea-cage finfish (non-salmonid) industry of Australia.

Shane Roberts, Matthew Bansemer, Matt Landos

FRDC Project No 2019-088

Government of South Australia
Primary Industries and Regions SA

THE UNIVERSITY of ADELAIDE

Future Fisheries VETERINARY SERVICE

Australian Government
Department of Agriculture

AUSTRALIAN SOUTHERN BLUEFIN TUNA INDUSTRY ASSOCIATION LTD (ASBTIA)

CLEANSEAS Australian Kingfish

INDIAN OCEAN FRESH AUSTRALIA

HUON AQUACULTURE

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Dan Fisk	Clean Seas Seafood Ltd
Erica Starling	Indian Ocean Fresh Pty Ltd
Steve Percival	Huon Aquaculture Group Ltd

Input was provided by other persons during the development of the National biosecurity plan guidelines for the Australian sea-cage finfish (non-salmonid) industry. These contributions are gratefully acknowledged and at the time included:

Justine Arnold (Indian Ocean Fresh Pty Ltd)
Claire Webber (Australian Southern Bluefin Tuna Industry Association Ltd)
Dr Olivia Liu (Department of Agriculture, Water and the Environment)
Dr Marty Deveney (South Australian Research and Development Institute)
Karina Worrell (New South Wales Department of Primary Industries)
Dr James Fensham and Dr Chun-han Lin (FFVS Pty Ltd)
Jay Dent, Adam Miller (Clean Seas Seafood Ltd)
Matthew Whittle (Huon Aquaculture Group Ltd)
Dr Adam Main, Kaine Jakaitis, Dr Jessica Buss (PIRSA)
Wayne Hutchinson (FRDC)
Dr Andrew Larkins (Western Australian Department of Primary Industries and Regional Development)

In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

Contents

Acknowledgments

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- Matthew Whittle (Huon Aquaculture Group Ltd)
- Dr James Fensham and Dr Chun-han Lin (Future Fisheries Veterinary Services [FFVS] Pty Ltd)
- Dr Adam Main, Kaine Jakaitis and Dr Jessica Buss (Primary Industries and Regions South Australia)
- Dr Marty Deveney (South Australian Research and Development Institute)
- Karina Worrell (New South Wales Department of Primary Industries)
- Dr Andrew Larkins (Department of Primary Industries and Regional Development)
- Dr Olivia Liu (Department of Agriculture, Water and the Environment)
- Wayne Hutchinson (Fisheries Research and Development Corporation)

Abbreviations

AHC	Animal Health Committee
DAWE	Department of Agriculture, Water and the Environment
FFVS	Future Fisheries Veterinary Services
FRDC	Fisheries Research and Development Corporation
PIRSA	Primary Industries and Regions South Australia

Executive Summary

Biosecurity plans describe the systems put in place to protect a farm from the introduction, spread and transmission of diseases. Nationally, the need for sector-specific biosecurity plans were identified as a key activity in AQUAPLAN 2014-2019. In 2018, a National Aquaculture Industry Biosecurity Survey was also conducted to determine the level of biosecurity knowledge and current biosecurity practices within the eight main aquaculture sectors (abalone, barramundi, edible oysters, pearls, prawns, salmonids, southern bluefin tuna and yellowtail kingfish). From this survey, all sectors indicated that they would like assistance to develop and implement on-farm biosecurity plans. This also includes the development of nationally consistent sector-specific biosecurity plans guidelines, which would assist farmers to develop their farm biosecurity plan. National biosecurity guidelines already exist, or are under development, for other sea-cage aquaculture industries, including the salmonid industry (Department of Primary Industries, Parks, Water and Environment, 2020) and barramundi aquaculture industry (Landos et al., 2019).

In this project, we developed guidelines to provide the Australian sea-cage finfish (non-salmonid) industry with the tools and templates to create an auditable farm biosecurity plan. Consideration was given to the current farming of yellowtail kingfish (*Seriola lalandi*), southern bluefin tuna (*Thunnus maccoyii*) and cobia (*Rachycentron canadum*). There were two components to this project. Firstly, an industry-government workshop was held on the 7 November 2019 in Adelaide. Attendees included representatives from the sea-cage finfish industry (peak body industry representatives, farm managers, hatchery representatives) and relevant state government representatives across Australia. Attendees discussed disease risks for sea-cage finfish farms, existing biosecurity guidelines, policy, risk assessments, and the appropriate content of a sea-cage finfish (non-salmonid) biosecurity plan. Based on these discussion, attendees workshopped best practice and practical biosecurity management for sea-cage finfish (non-salmonid) farms.

The second component of the project was to develop biosecurity plan guideline and template for the sea-cage finfish (non-salmonid) industry of Australia. These guidelines are based on information from the industry workshop and related reference material. In these guidelines, we highlight the potential routes for disease transmission, including disease spread onto, with-in and off of the farm to facilitate associated risk assessments for disease transmission. Risk pathways and associated mitigation processes identified in the workshop, included water, animals, equipment, vessels, vehicles, feed and people. These pathways were included in the biosecurity plan guidelines. In addition, templates for suggested supporting documents are also provided in the guideline to develop a comprehensive plan.

The biosecurity guidelines produced in this project provide detailed guidance to develop new or improve existing farm biosecurity plans at the enterprise level. We recommend industry now consider implementing good farm biosecurity to prevent and manage disease in collaboration with their jurisdictional government. This would include developing, reviewing, refining and adequately auditing farm biosecurity plans. Workshops could be considered to facilitate industry uptake and farm

biosecurity plan development and implementation. In addition to disease management and potential trade and market access requirements, it should be noted that many jurisdictions now require (or will require) those applying for a new aquaculture permit or licence to develop an aquaculture biosecurity plan. At a broader level, there are other aquaculture industry sectors that still require nationally agreed farm biosecurity guidelines.

Key words

Biosecurity plan, disease prevention, southern bluefin tuna, yellowtail kingfish and cobia

Introduction

Biosecurity is crucial for successful aquaculture production. Biosecurity plans describe the systems put in place to protect a farm from the introduction, spread and transmission of diseases (Dewulf and Immerseel, 2019). It is important that measures are in place to mitigate disease exposure at each critical control point, including animal movement, people, equipment, water, feed and waste. The best way to protect sea-cage aquaculture industry and the adjacent environment, from the threat of disease is to have a strong, auditable biosecurity plan in place. A biosecurity plan should describe and address these measures thought training, records management and administration of the farm systems.

Farm biosecurity plans provide the following:

1. Disease prevention measures.
2. Disease response measures.
3. Biosecurity requirements for movement and trade in livestock for aquaculture.
4. Biosecurity requirements of Aquatic Emergency Disease Response Arrangements (AqEADRA).

In 2014, the aquatic animal industries and Commonwealth and state and territory governments endorsed Australia's third national strategic plan for aquatic animal health – AQUAPLAN 2014-2019. This project is a component of one of the key activities (Activity 1.1), to '*develop sector-specific biosecurity plan templates and guidance documents*'. In 2015, the Commonwealth of Australia 'Agricultural Competitiveness White Paper' was released with strategic priority being: "improved market access underpinned by a strong biosecurity system". In 2016, the national 'Aquaculture Farm Biosecurity Plan – generic guidelines and template' was finalised (https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/fisheries/aquaculture/aquaculture-farm-biosecurity-plan.pdf). That document provides broad guidelines for developing biosecurity plans, and can also be used to develop sector specific biosecurity plan guidelines.

Sea-cage finfish (non-salmonid), including southern bluefin tuna, yellowtail kingfish and cobia industries, do not currently have a nationally agreed farm biosecurity plan

guideline and templates. These guidelines and templates would assist farmers with the development of their on-farm biosecurity plans. A nationally agreed biosecurity plan guideline would ensure a common level of biosecurity risk management to support specific enterprise and whole of industry productivity. Given that disease is a major limiting factor to the production and growth in aquaculture, industry-wide biosecurity guidelines would be a crucial business component of an aquaculture enterprise. In addition to disease management and potential trade and market access requirements, it should be noted that many jurisdictions now require (or will require) those applying for a new aquaculture permit or licence to develop an aquaculture biosecurity plan.

Given the above, and similar to other aquaculture sectors, it is recommended that industry work to implement farm biosecurity plans to secure their industry and facilitate growth, and that the state government authorities recognise these plans and their implementation.

For the above reasons, the Commonwealth Department of Agriculture, Water and the Environment (DAWE) engaged Department of Primary Industries and Regions South Australia and Future Fisheries Veterinary Service Pty Ltd and committed funding to a project aimed at developing a nationally agreed biosecurity guidance document for the Sea-cage finfish (non-salmonid) industries. As the sea-cage (non-salmonid) industry is currently spread across a number of states (currently SA, WA and NSW), a representative from each relevant state that has sea-cage finfish (non-salmonid) production was included on the writing group for the plan.

Objectives

Develop an industry endorsed, national sector-specific biosecurity plan guideline and template for the Australian sea-cage aquaculture industry (non-salmonids, which currently includes tuna, kingfish and cobia).

Methods

There were two components to this project

1. An industry-government workshop with representatives from the sea-cage finfish (non-salmonid) industry in Australia (tuna, kingfish and cobia).
2. Draft a national biosecurity plan guideline based on information from the industry workshop and related reference material, including existing guidance documents, plans and audits.

Industry-government workshop

A workshop was held on the 7 November 2019 in Adelaide between government and industry to develop a biosecurity plan guideline and template for the sea-cage finfish

(non-salmonid) industry (Appendix 1 [workshop information sheet for participants] and Appendix 2 [workshop presentations]).

The workshops was attended by relevant personnel, including farm managers, hatchery representatives, industry peak body representatives, and relevant state government representatives, from:

- Indian Ocean Fresh Pty Ltd.
- Clean Seas Seafood Ltd.
- Australian Southern Bluefin Tuna Industry Association Ltd.
- Huon Aquaculture Group Ltd.
- New South Wales Department of Primary Industries.
- Department of Agriculture, Water and the Environment.
- South Australian Research and Development Institute.
- Fisheries Research and Development Corporation.
- Western Australia Department of Primary Industries and Regional Development.
- Future Fisheries Veterinary Services.
- Primary Industries and Regions South Australia.

The objectives of this workshop were to:

- Discuss and identify disease risks for sea-cage finfish farms.
- Identify relevant existing guidelines, policy, risk assessments and other documents.
- Discuss appropriate content of a sea-cage finfish (non-salmonid) biosecurity plan to mitigate the identified risks, noting site specific risks would also be relevant for each enterprise.
- Agree on best practice biosecurity management on sea-cage finfish (non-salmonid) farms and practical biosecurity management and planning.

Development of the guidelines

Following on from the workshop, we drafted the biosecurity plan templates and guidance documents. This involved:

- Collating and reviewing the outputs from the workshop.

- Reviewing relevant literature and farm biosecurity plan manuals for other agriculture sectors.
- Review of existing aquaculture company plans and biosecurity practices.
- Providing workshop participants, including co-investigators and government departments, the opportunity to review and provide feedback on the documents. This was important to ensure the guidelines can be nationally agreed on.

The output from this project will be a nationally agreed draft biosecurity plan guideline for the sea-cage aquaculture sector. Once submitted, DAWE will progress the final draft plan to the Sub-Committee on Aquatic Animal Health (SCAAH) and Animal Health Committee (AHC) for comment and endorsement. The final endorsed plan will be made publically available and published by DAWE on the department's website.

Results, Discussion and Conclusion

In this project, we have successfully delivered the following outputs and benefits:

- Held a government and industry workshop to develop biosecurity guidelines for the sea-cage finfish (non-salmonid) industry.
- Gained consensus around measures that meet a common level of biosecurity risk management.
- Improved biosecurity and disease prevention awareness by the sea-cage finfish (non-salmonid) industry.
- Increased knowledge of major aquaculture diseases for finfish.
- Developed a biosecurity plan template and guidance documents for the sea-cage finfish (non-salmonid) industry of Australia.
- Enhanced working relationships amongst government and industry (state and national).
- Improved the ability for the southern bluefin tuna, yellowtail kingfish and cobia industry to fulfil improved disease preparedness and shared risk mitigation responsibilities required under an Aquatic Deed, should they become signatories.

Implications

The biosecurity plan guidelines and associated documents provides industry with:

- Guidance to develop a new or improve an existing farm biosecurity plan, which represents a crucial step in ensuring a profitable, secure and resilient aquaculture industry.
- A nationally consistent approach to biosecurity planning and farm biosecurity plans for the sea-cage industry.

The biosecurity plan guidelines and associated documents facilitate industry trade in livestock (and their products) or as an independent business decision to protect the farm, industry and community from disease incursions. A farm may elect to adopt some or all of the best practice biosecurity recommendations outlined in the guidance documents.

Farm biosecurity plans are a common requirement of health accreditation programs and livestock translocation protocols. This can inform consistent conditions for movements of live animals within and between jurisdictions, for export and integrated breeding programs.

Recommendations and Further Development

We recommend that the sea-cage industry adopt and implement these guidance documents at an enterprise level. Industry and government should be encouraged to develop a workable process to enable ongoing review following initial implementation. This may be achieved either through a state government commitment to facilitate individual businesses with implementation, or through third party auditors / consultants, or as a discrete externally funded implementation project.

Farm biosecurity is a constantly evolving process that requires continual refinement and adaptation. This may be due to aspects of business expansion (e.g. new production areas, new species being farmed), new disease threats or risk pathways, improved risk mitigation strategies or technology or available infrastructure and resources.

The guidelines developed through this project have highlighted identifiable risks and mitigation strategies that specifically pertain to the sea-cage industry. It should be noted that site specific risks may also require mitigation at the enterprise level, which the guidelines provide a process to achieve that. There are aspects of sea-cage aquaculture production that were outside the scope of this document, such as land-based hatchery and broodstock production facilities, and processing. Furthermore, at a broader level, there are other aquaculture industry sectors that still require nationally agreed farm biosecurity guidelines.

Extension and Adoption

Biosecurity is fundamental to the profitability, efficiency and sustainability of all sectors. Aquatic animal diseases are a major limiting factor for the growth in aquaculture, and present an ongoing threat to their viability and sustainability; exotic and endemic diseases require a strategic approach.

Implementation of on-farm biosecurity can be a challenge, but is achievable based on the successful implementation of national biosecurity guidelines in other sectors (e.g. oyster hatcheries and abalone farms). From those learnings in South Australia for example, we recommend farms now consider implementing good farm biosecurity to prevent and manage disease in collaboration with their jurisdictional government. This would include developing, reviewing, refining and adequately auditing farm biosecurity plans. Dependent on funding and resource availability, government or consultants can assist or provide advice, noting that jurisdictional requirements (legislative and policy) must be considered. Workshops could better facilitate industry uptake of farm biosecurity plan development and implementation. Industry-wide biosecurity plans will support the movements of live animals, interstate trade, export trade, (consumption) and integrated breeding programs.

Draft guidelines were provided to workshop participants (farm managers, hatchery representatives, industry peak body representatives, and relevant state government representatives) for review. Upon endorsement by Animal Health Committee (AHC) the national biosecurity plan guidelines (Appendix 3) will be published by DAWE. The website link will be circulated to workshop participants and relevant jurisdictions.

Project materials developed

Appendix 1 - Workshop information sheet for participants.

Appendix 2 - Workshop presentations.

Appendix 3 - National biosecurity plan guidelines for the Australian sea-cage finfish (non-salmonid) industry

Project References

Animal Health Australia, 2010. Farm Biosecurity Manual for the Duck Meat Industry. Animal Health Australia. ISBN 978 1 876714 94 9.

Animal Health Australia, 2012. National Farm Biosecurity Reference Manual: Grazing Livestock Production. Animal Health Australia. ISBN 978-1-921958-05-2.

Animal Health Australia, 2013. National Biosecurity Manual for Beef Cattle Feedlots. Animal Health Australia. ISBN 978-1-921958-18-2.

Animal Health Australia, 2013. National Farm Biosecurity Manual for Pig Production. Animal Health Australia. ISBN: 978 1 921958 16 8.

Animal Health Australia, 2015. National Farm Biosecurity Technical Manual for Egg Production. Animal Health Australia. ISBN 978-1-921958-22-9.

Australian Government Department of Agriculture, Fisheries and Forestry, 2009. National Biosecurity Manual: Poultry Production. 1st ed. Commonwealth of Australia. ISBN 978-1-92157501-3.

Australian Government Rural Industries Research Development Corporation. 2010. National Farm Biosecurity Manual for Chicken Growers. Australian Chicken Meat Federation Inc.Department of Primary Industries, Parks, Water and Environment. 2020. *Sustainable Industry Growth Plan for the Salmon Industry*, DPIPWE, viewed 14 May 2020, <https://dpipwe.tas.gov.au/sea-fishing-aquaculture/marine-farming-aquaculture/salmon-industry-growth-plan>

Department of Agriculture 2014, AQUAPLAN 2014–2019: Australia's National Strategic Plan for Aquatic Animal Health, Canberra. Commonwealth of Australia. ISBN 978-1-760030-77-3.

Dewulf, J., Immerseel, F.V. (eds) 2019. Biosecurity in animal production and veterinary medicine – from principles to practice. ACCO, Belgium, The Netherlands and Luxembourg. ISBN, 9789463443784.

Ellard K 2015, Disease control recommendations to support aquatic animal health? Proceedings of the Third OIE Global Conference on Aquatic Animal Health, Session 4, pp. 137-143.

Georgiades, E., Jones, B., Fraser, R., 2016. Options to Strengthen On-farm Biosecurity Management for Commercial and Non-Commercial Aquaculture. Technical Paper. Ministry for Primary Industries. ISBN 978-1-77665-341-6 (o)

Ministry for Primary Industries, 2016. Aquaculture Biosecurity Handbook. Ministry for Primary Industries, Wellington.

Landos, M., Calogeras, C., Hayward, S., Ruscoe, J. 2019. National Biosecurity Plan Guidelines for Australian Barramundi Farms. Department of Agriculture, Canberra June 2019. CC BY 3.0.

Marine Pest Sectoral Committee 2018, *National biofouling management guidelines for the aquaculture industry,* Department of Agriculture and Water Resources, Canberra, December. CC BY 4.0.

Mobsby, D., Koduah, A. 2017. Australian fisheries and aquaculture statistics 2016, Fisheries Research and Development Corporation project 2017-095. ABARES, Canberra, December. CC BY 4.0.

Oidtmann, B.C., Crane, C.N., Thursh, M.A., Hill, B.J., Peeler, E.J. 2011. Ranking freshwater fish farms for the risk of pathogen introduction and spread. Preventive Veterinary Medicine, 102, 329-340.

Oidtmann, B.C., Peeler, E.J., Lyngstad, T., Brun, E., Jensen, B.B., Stärk, K.D.C. 2013. Risk-based methods for fish and terrestrial animal disease surveillance. Preventive Veterinary Medicine, 112, 13-26.

Oidtmann, B.C., Pearce, F.M., Thrush, M.A., Peeler, E.J., Ceolin, C., Stärk, K.D.C., Pozza, M.D., Afonso, A., Diserens, N., Reese, R.A. and Cameron, A. 2014. Model for ranking freshwater fish farms according to their risk of infection an illustration for viral haemorrhagic septicaemia. Preventive Veterinary Medicine, 115, 263-279.

Spark, E., Roberts, S., Deveney, M., Bradley, T., Dang, C., Wronski, E., and Zippel, B, PIRSA Fisheries and Aquaculture 2018. National Biosecurity Plan Guidelines for Australian Oyster Hatcheries. Department of Agriculture and Water Resources, Canberra August 2018. CC BY 3.0.

Spark, E., Roberts, S., Deveney, M., Bradley, T., Dang, C., Wronski, E., and Savva, N., PIRSA Fisheries and Aquaculture 2018. National Biosecurity Plan Guidelines for the Land Based Abalone Industry. Department of Agriculture and Water Resources, Canberra August 2018. CC BY 3.0.

Sub-Committee on Aquatic Animal Health (SCAAH) 2016. Aquaculture Farm Biosecurity Plan: generic guidelines and template. Department of Agriculture and Water Resources, Canberra [January]. CC BY 3.0.

Appendix 1 -
Information sheet for workshop

Development of a national sector-specific biosecurity plan guideline and template for the sea-cage finfish (non-salmonid) industry of Australia.

Information sheet

Adelaide, South Australia

7 November 2019

Government of South Australia
Primary Industries and Regions SA

Future Fisheries
VETERINARY SERVICE

FRDC

Australian Government
Department of Agriculture

Introduction

Background

Biosecurity plans describe the systems put in place to protect a farm from diseases. A biosecurity plan should describe and address in detail the pathways for introduction, spread and transmission of disease and describe training, records management and administration of the farm systems. Measures must be in place to mitigate disease exposure at each critical control point in association with animal movement, people, equipment, water, feed and waste.

Farm biosecurity plans provide the following:

1. Disease prevention measures
2. Disease response measures
3. Biosecurity requirements for movement and trade in livestock for aquaculture
4. Biosecurity requirements of Aquatic Emergency Disease Response Arrangements (AqEADRA);

Sea-cage finfish (non-salmonid), including southern bluefin tuna, yellowtail kingfish and cobia industries do not currently have a nationally agreed farm biosecurity plan guideline. A nationally agreed biosecurity plan guideline for sea-cage finfish (non-salmonid) will provide a bench mark (set of minimum requirements) to ensure nationally consistent farm biosecurity is implemented. Biosecurity is crucial successful aquaculture production. The best way to protect sea-cage aquaculture industry and the adjacent environment, from the threat of disease is to have a strong, auditable biosecurity plan in place.

In 2014, the aquatic animal industries and Commonwealth and state and territory governments endorsed Australia's third national strategic plan for aquatic animal health – AQUAPLAN 2014-2019. This project is a component of one of the key activities (Activity 1.1), to '*develop sector-specific biosecurity plan templates and guidance documents*'.

In 2015 the Commonwealth of Australia 'Agricultural Competitiveness White Paper' was released with strategic priority being: "improved market access underpinned by a strong biosecurity system".

In 2016, the national 'Aquaculture Farm Biosecurity Plan – generic guidelines and template' was finalised. That document provides broad guidelines for developing biosecurity plans and can be used to develop a sector specific nationally agreed biosecurity plan guidelines.

For the above reasons, the Commonwealth Department of Agriculture, Water and the Environment (DAWE) have engaged Department of Primary Industries and Regions South Australia and Future Fisheries Veterinary Service Pty Ltd and committed funding to a project aimed at developing a nationally agreed biosecurity guidance document for the Sea-cage finfish (non-salmonid) industries. Consultation is a key component of this project, as the sea-cage (non-salmonid) industry is currently spread across a number of states (SA, WA and NSW). A representative from each relevant state that uses sea-cage finfish (non-salmonid) production will be included on the writing group for the plan.

This workshop forms part of FRDC / DAWE project: "Development of a national sector-specific biosecurity plan guideline and template for the sea-cage finfish (non-salmonid) industry of Australia". (FRDC Project Number: 2019-088).

Aim

National agreement on content of a sea-cage finfish (non-salmonid) biosecurity plan

Objectives

- Discuss disease risks for sea-cage finfish (non-salmonid) farms
- Identify relevant existing guidelines, policy, risk assessments and other documents
- Discuss appropriate content of a sea-cage finfish (non-salmonid) biosecurity plan
- Agree on best practice biosecurity management on a sea-cage finfish (non-salmonid) farms

Expected outcomes

- Consensus around industry measures that need to be implemented to meet common levels of biosecurity risk management
- Industry-wide biosecurity plans will support conditions for movements of live animals within and between jurisdictions, for export and integrated breeding programs
- Increased knowledge of major finfish diseases of concern
- Greater industry disease prevention and preparedness measures
- A more profitable, secure and resilient finfish aquaculture industry

Exercise Conduct

Participants

The following organisations will participate in the workshop:

- Indian Ocean Fresh
- Cleanseas
- Australian Southern Bluefin Tuna Industry Association LTD
- Huon Aquaculture
- New South Wales Department of Primary Industries
- Western Australia Challenger TAFE
- Department of Agriculture, Water and the Environment
- South Australian Research and Development Institute
- Fisheries Research and Development Corporation
- Western Australia Department of Primary Industries and Regional Development.
- Future Fisheries Veterinary Services
- Primary Industries and Regions South Australia

What to bring

Please bring the following items with you to the workshop

- Notebook and pen
- A copy of your current biosecurity plan if available
- Other relevant documents as needed

Code of Conduct for the Workshop

1. We start on time and finish on time.
2. We all participate and contribute - everyone is given opportunity to voice their opinions.
3. We actively listen to what others have to say, seeking first to understand, then to be understood
4. We participate in activities that are assigned and complete them on time
5. We participate in open and honest feedback in a constructive manner
6. We do not distract other participants from the workshop (including mobile phone)
7. We strive to continually improve our workshop process

Workshop Administration

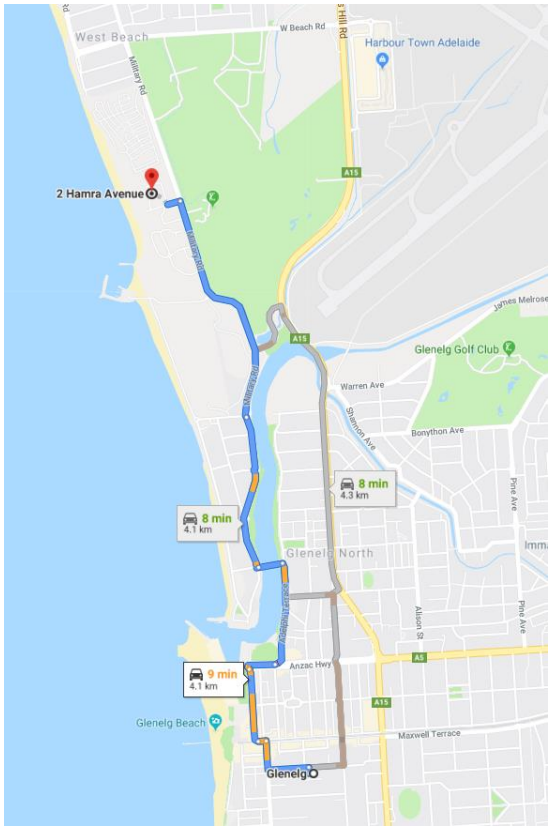
Date and Time

Thursday, 7 November 2019, 9:00am to 5:00 pm

Venue

The workshop will be held at:

SARDI Aquatic Sciences
2 Hamra Ave, West Beach
Adelaide, South Australia, 5024
Reception: 8207 5400



Travel and Accommodation

Please ensure that you arrange your own travel (including flights) so that you are at the workshop venue by the required time on the day. All participants are responsible for booking and paying for their own travel and accommodation.

Catering

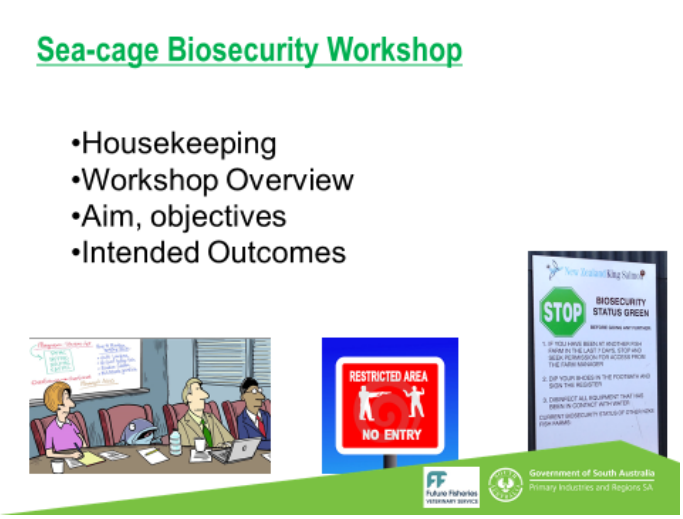
Tea/coffee, morning tea, lunch and afternoon tea will be provided during the workshop. For those participants interested, there will be a dinner after the workshop at about 7pm, which will be paid for by participants.

Agenda

Time	Topic	Who
0845	Arrival, tea and coffee, and registration	
9:00	Welcome, icebreaker and Introduction	Shane Roberts, Matthew Bansemer and Matt Landos
9:10	Other Aquaculture Biosecurity Plan guidelines (Generic, Oyster Hatchery, Land-based Abalone & Barramundi)	Shane Roberts
9:30	Disease of sea-cage finfish (non-salmonid)	Marty Deveney
9:50	Current on-farm biosecurity– Indian Ocean Fresh	Erica Starling and Justine Arnold (Indian Ocean Fresh)
10:00	Current on-farm biosecurity – Cleanseas	Dan Fisk, Jay Dent and Adam Miller (Cleanseas)
10:10	Current on-farm biosecurity – ASBTIA	Brian Jeffriess and Claire Webber (ASBTIA)
10:20	Current on-farm biosecurity – Huon Aquaculture	Steve Percival and Matthew Whittle (Huon Aquaculture)
10:30	***Morning Tea***	
11:00	Facilitated discussion: Development of a sea-cage finfish plan • Group task: identify main risk pathways for disease introduction and spread for sea-cage finfish. • Discussion: key elements of a sea-cage finfish plan, including (animal movement, people, equipment, water, feed and waste).	All. Facilitators: Shane Roberts, Matthew Bansemer and Matt Landos
13:00	***Lunch***	
14:00	Facilitated discussion: Development of a sea-cage finfish plan • Group task: identify processes, records management (SOPs), infrastructure, staff training etc to mitigate the identified disease risks.	All. Facilitators: Shane Roberts, Matthew Bansemer and Matt Landos
15:15	***Afternoon Tea***	
15:30	Continue Group task – groups share outcomes	All
16:00	Components of a sea-cage finfish sector biosecurity guidance document – discussion	Matt Landos
16:30	Where to from here	Shane Roberts, Matthew Bansemer and Matt Landos
17:00	***Finish***	

Appendix 2 -
Presentations from workshop

Presentation 1



Workshop Outcomes

Expected outcomes

- Consensus around industry measures that need to be implemented to meet common levels of biosecurity risk management
- Industry-wide biosecurity plans will support conditions for movements of live animals within and between jurisdictions, for export and integrated breeding programs
- Increased knowledge of major finfish diseases of concern
- Greater industry disease prevention and preparedness measures
- A more profitable, secure and resilient finfish aquaculture industry

Future Fisheries Veterinary Service

Government of South Australia
Primary Industries and Regions SA

Presentation 2

Future Fisheries
VETERINARY SERVICE

How to reduce disease risks with Biosecurity

Director, Registered Veterinarian, **Dr Matt Landos**

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Associate, Registered Veterinarian, Dr Chun-han Lin

BVSc(Hons)

25% of prawn farms chlorinated under Government order

Trawl fishers not allowed to move uncooked product outside infected zone

Government requiresa flow through abalone farm to stop discharge after virus detected

Biosecurity Concepts

- Prevention of expression of disease (avoid/ monitor stressors)
- Prevention of entry of pathogens into contact with stock;
- Prevention of movement of pathogens around stock populations; and
- Prevention of movement of pathogens to outside a zone or farm.

Biosecurity done well- the benefits

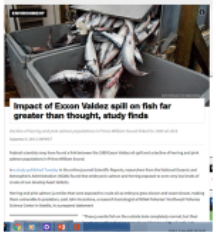
- Improved animal health and production through preventing disease outbreaks
- Increased investor confidence in aquaculture
- Reduced disease transmission and amplification within and between farms and regions
- Early disease detection allowing faster response to reduce impact
- Less demand for medicine and impacts from withholding periods on medicated stock
- Support claims of freedom from disease which can alter market access and trade
- Support food safety and public confidence
- Support aspects of Industry Best Practice certification programs

Diagnostic testing

Sanitary barriers

Local disease expression link to environmental health

- Long Island Lobster shell disease and mortality – wastewater and agricultural run-off
- Gladstone dredging sediment and metals pollution drove elevated parasite loads on fishes and sharks and shell disease in crabs
- Glyphosate based herbicide in NZ drove up parasitism in wild fish and deformity rates
- Exxon Valdez spill drove Viral Haemorrhagic Septicaemia in herring stock collapse
- Macquarie Harbour –low oxygen and viral disease increased stock loss
- Coral disease and climate change

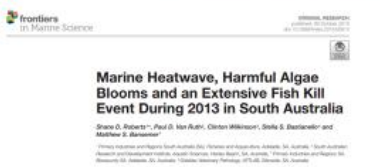


Impact of Exxon Valdez spill on fish far greater than thought, study finds

Mass kill risks brought by nature's response to human activity

Fish kill investigation:

PIRSA Fisheries and Aquaculture Division



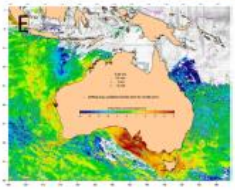
frontiers in Marine Science

Marine Heatwave, Harmful Algae Blooms and an Extensive Fish Kill Event During 2013 in South Australia

Vibrio spp

Marine Heatwave, Harmful Algae Blooms and an Extensive Fish Kill Event During 2013 in South Australia

Roberts et al (2019) Frontiers in Marine Science

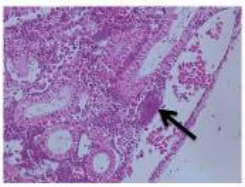


Government of South Australia

Primary Industries and Regions SA

Vibrio spp

- Temperature stress
  + harmful algae (gill trauma)
  + immuno-compromised fish (parasite / age)
  = systemic bacterial infection (incl. *V. harveyi*)
  & mortality in small percent of fish



40x mag. – kidney bacteria

- Under the right conditions, Vibrio spp. can be pathogenic, but low virulence & not considered highly infectious. Secondary opportunistic clinical bacterial infection.

Roberts et al (2019) Frontiers in Marine Science

Climate change – mitigation

After the outbreak – the learning

- In the wash-up of any aquatic disease event questions are asked:
- What caused the outbreak?
- Where did it come from?
- Who is to blame?
- Was the event foreseeable?
- Could it have been prevented?
- How much did it cost?
- Can I recover my losses- legal action?
- Will it happen again?
- Did you have access to approved chemical disinfectants required to minimise spread?

Understanding the evidence

To get precise answers demands:

- Samples
  - Good quality,
  - Well selected
  - Preserved in variety of ways for range of diagnostic tests
  - Abundant numbers of samples
- Good stock data
  - Counts
  - Weight
  - Feed (type, batch, QA)
  - Location (movement history, when and where)
  - Health status
- Knowledge of biosecurity risk pathways

During the outbreak – who to call?

- Manager of farm/business:

"Houston, we've got a problem"

During the outbreak – who to call?

- Market/ Distributors: If zoonotic (transmissible disease risk for humans), product recall may need to beurgently considered.

During the outbreak – who to call?

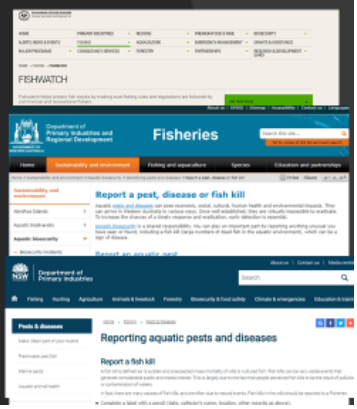
- Aquatic Veterinarian
- Trained to investigate disease outbreaks
- Trained in biosecurity
- Guide sampling to reach diagnosis
- Veterinary Surgeons Act supports their role
- Assist design and implement disease control measures and movement controls
- Design decontamination protocols appropriate to situation
- Prescribe medicine where indicated

During the outbreak- who to call

- State Regulator
- Emergency Hotline

If you are suspicious that you are witnessing a diseases on the National Reportable Disease List http://www.ag.culture.gov.au/animal/aquatic/reporting/reportable-diseases then call:

Commonwealth Emergency Disease Watch Hotline (24/7): **1800 675 888** (free call within Australia)



How to be a "prepper"

- Have a biosecurity plan drawn up
- Assess hazards and risk pathways
- Detail the mitigations and who is responsible for them
- Implement mitigations
- Train staff in the plan
- Have a mass mortality disposal plan developed with local and State Government oversight

Prepping for outbreak response

- Maintain accurate detailed up to date records for
- Stock number
- Cage location
- Stock movements
- People/boat/diver movements
- Feed inputs
- Health surveillance data
- Water quality monitoring and response plan
- Sufficient medication on hand for timely response

A biosecurity plan will assist in putting in place the systems that can deliver answers to these questions

- What caused the outbreak?
- Where did it come from?
- Who is to blame?
- Was the event foreseeable?
- Could it have been prevented?
- How much did it cost?
- Can I recover my losses- legal action?
- Will it happen again?

Presentation 3

Sea-cage Biosecurity Workshop

Biosecurity plan guidelines

FISHERIES & AQUACULTURE PIRSA

7 November 2019
Adelaide, South Australia
FRDC 2019-088

FRDC

Future Fisheries VETERINARY SERVICE

Australian Government Department of Agriculture

SOUTH AUSTRALIA

Government of South Australia Primary Industries and Regions SA

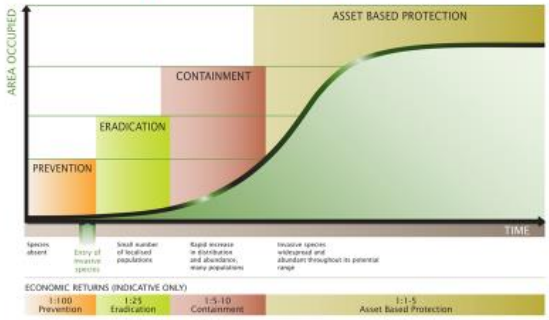
What is a biosecurity plan?

- Describes the systems put in place to protect a farm from disease and pests

Identify risk pathways
(introduction & spread)

Systems include:
- Procedures (SOP's)
- Record keeping (forms & checklists)
- Equipment
- Infrastructure
- Signage
- Staff training

Why: Disease prevention / prep vs Response

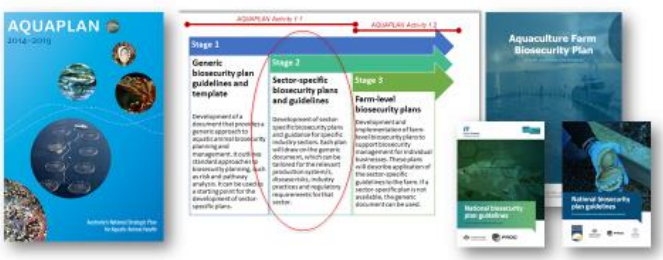


Need for nationally agreed biosecurity

- **National bench mark / standard**
- **Increase industry-wide disease prevention & response**
- **Facilitate trade and market access**
- **Meet requirements** (legislation: general biosec. obligation)
- **More profitable, secure and resilient industry**

Need for nationally agreed biosecurity

- Contribute to the development of a national biosecurity guideline for the sea-cage (non-salmonid) sector
- Improve understanding of how to develop a farm biosecurity plan

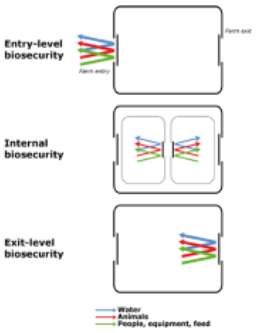


Example of effective farm biosecurity

Has enabled the oyster industry to protect themselves from POMS AND regain trade in spat (eg movement from infected areas to free areas)

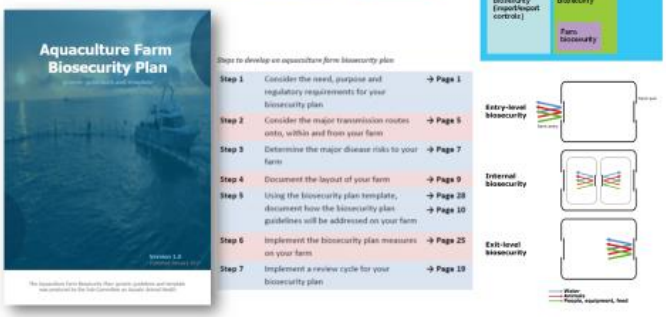
Purpose of a biosecurity plan

- **Reduce the risk of diseases**
  - Being introduced into your farm (entry-level biosecurity)
  - Spreading within your farm (internal biosecurity)
  - Escaping from your farm (exit-level biosecurity)
- **Emergency response protocols in place for serious disease outbreaks**

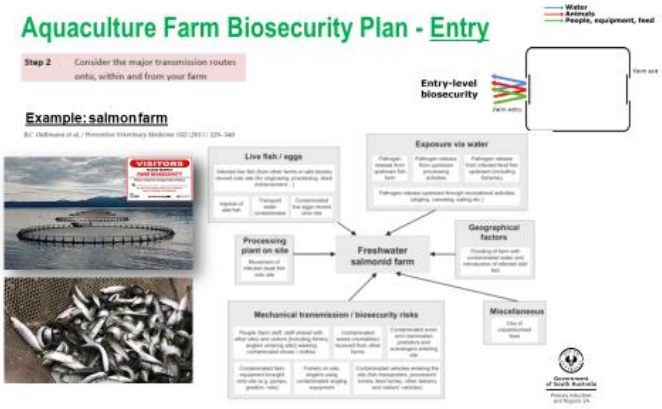


How: Aquaculture Farm Biosecurity Plan

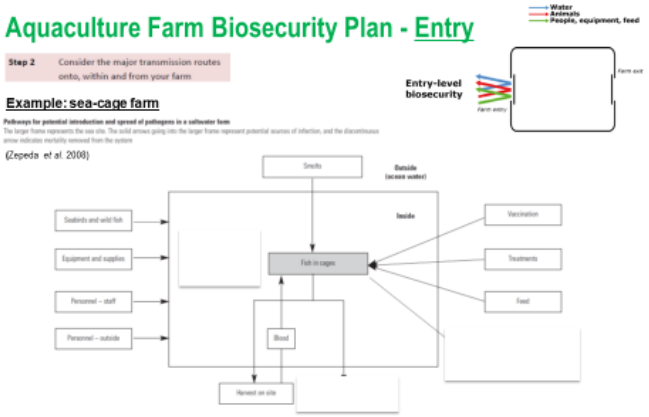
Perera et al (2008)



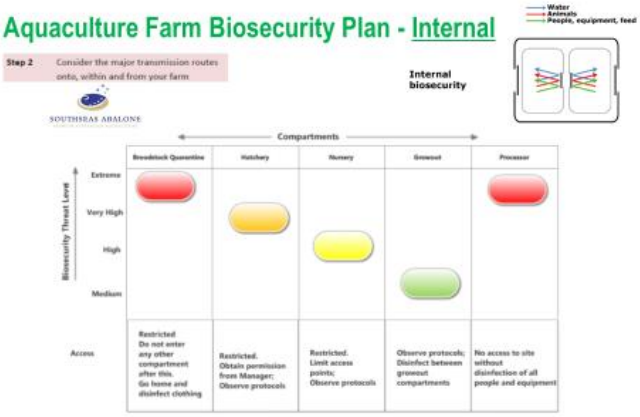
Aquaculture Farm Biosecurity Plan - Entry



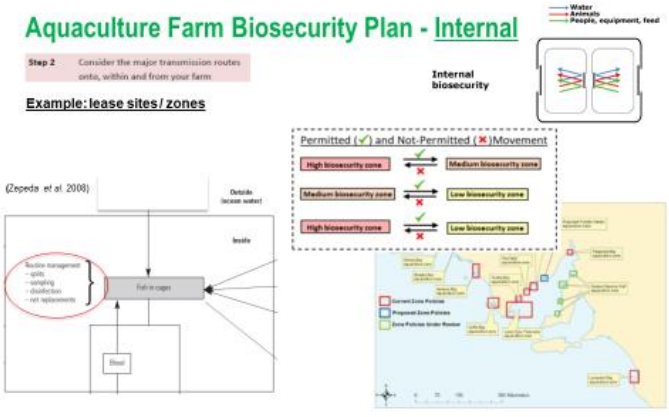
Aquaculture Farm Biosecurity Plan - Entry



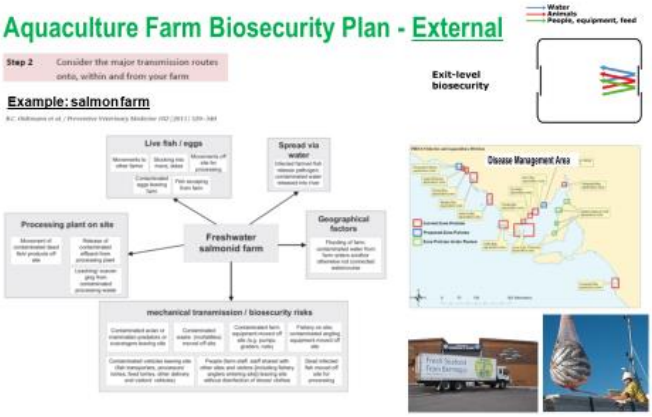
Aquaculture Farm Biosecurity Plan - Internal



Aquaculture Farm Biosecurity Plan - Internal



Aquaculture Farm Biosecurity Plan - External



Sector Biosecurity Plan: EXAMPLES

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Sector Biosecurity Plan: EXAMPLES

Sector Biosecurity Plan: EXAMPLES

Presentation 4

SARDI

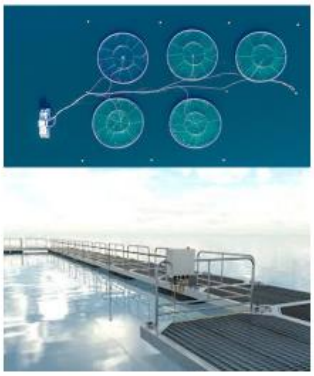
Important diseases for sea cage aquaculture in Australia

Marty Deveney

Workshop: National biosecurity plan for sea cage aquaculture
7 November 2019, SARDI Aquatic Sciences

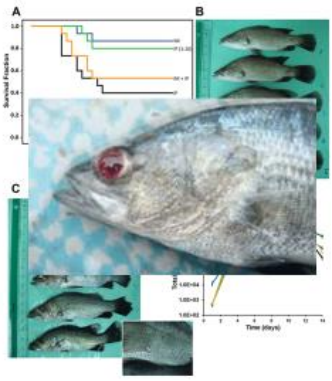
Disease and pathogens

- Range of pathogens, significance, lifecycles, management measures and treatments
- Divided these up by pathogen:
  - Viruses
  - Bacteria
  - Fungi
  - Parasites



Iridoviruses

- Cause acute mortality in snapper, YTK, cobia, barra, groupers
- Scale drop in barra
- Aquarium fish
- Associated with feeding fish and predation of wild fish
- Wild reservoirs
- Stress associated
- No registered vaccines

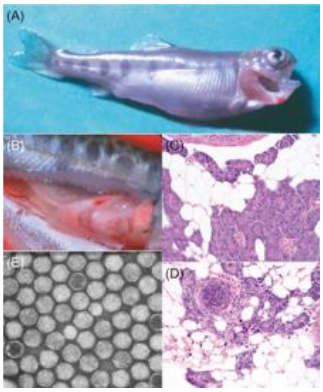


Iridoviruses

- Cause acute mortality in snapper, YTK, cobia, barra, groupers
- Scale drop in barra
- Aquarium fish
- Associated with feeding fish and predation of wild fish
- Stress associated
- No registered vaccines

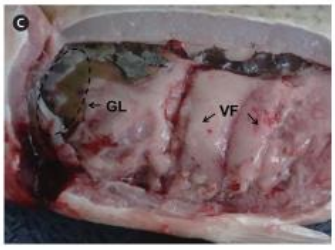
Birnaviruses

- Recorded in YTK, snapper
- Associated with wild fish
- Tissue associated
- Often slow, hard to diagnose mortality
- Vaccine for IPN in salmon, but not for other birnaviruses



Lactococcus

- Almost all fish
- Facultatively anaerobic, gram +ve
- Produces haemolytic toxin
- Very rapid disease onset
- Associated with temperature stress
- No vaccine, fail at high temp
- Treat with eryc, florfenicol ($$$)

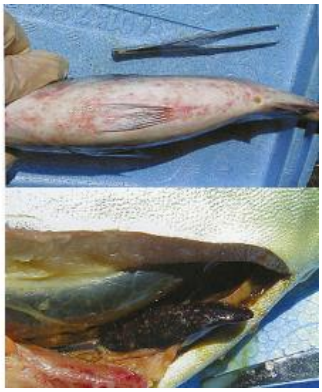


Streptococcus

- Almost all fish
- Gram +ve
- Produces range of toxins
- Localised: brain, heart, excretory kidney
- Rapid disease onset
- Associated with stress
- Range of vaccines
- Treat with OTC, eryc

Photobacterium

- Many fish
- Gram –ve
- Sudden mortality, granulomas in organs
- P.d.d. becomes intracellular
- Associated with enteritis in YTK
- Hard to treat – OTC, florfenicol
- FRDC vaccine project

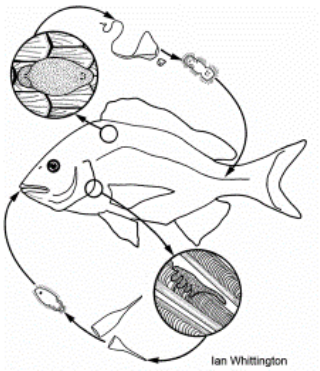


Vibrio

- Almost all fish
- Gram -ve
- Produces range of toxins
- Eye and skin infections
- Associated with stress
- Everywhere in seawater
- Treat with OTC

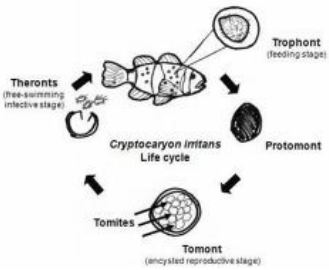
Fungi

- Less common than in ponds
- Filamentous (*Saprolegnia*???) in wounds
- *Aphanomyces* in estuaries associated with salinity pH changes
- *Ichthyophonus* associated with scavenging of carcasses



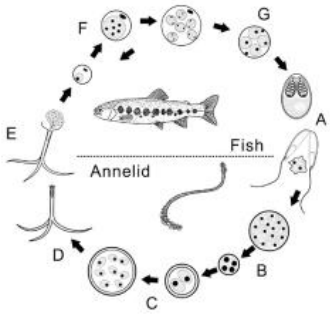
Monogeneans

- All fish
- Monopisthocotylea feed on mucus and epithelium – *Benedenia, Neobenedenia*
- Polyopisthocotyleans feed on blood – *Zeuxapta, Heteraxine*
- Direct lifecycle, egg resistant to treatment
- Disrupt lifecycle with strategic treatment
- Major production cost



Cryptocaryon

- All fish, cobia in sea cages
- Marine ich
- Direct lifecycle, adult resistant to treatment
- Disrupt lifecycle with strategic treatment
- Rare in sea cages but problematic where it occurs



Myxosporea

- All fish
- Encyst in muscle
- Produce enzymes – fish dissolve on death or cooking
- Lifecycles unknown
- Associated with warmer climates
- No treatment
- Hard to manage

Crustacea

- Many species
- Broad range of taxa
- Erode epithelium
- Lifecycles direct but complex
- Cannot treat stages off fish
- Wild reservoirs
- Treatment difficult (resistance)
- Hard to manage
- Costly

When biosecurity works, nothing happens

Thanks

Presentation 5

Objective of sessions / group tasks

- Contribute to the development of a national biosecurity guideline for the sea-cage (non-salmonid) sector
- Improve understanding of how to develop a farm biosecurity plan

Sea-cage Biosecurity Plan – the process

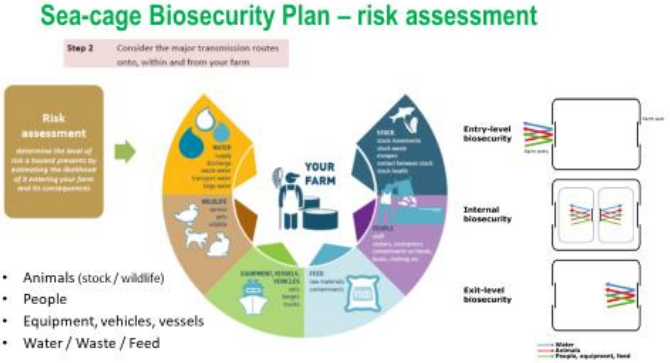
- procedures (SOP's)
- record keeping (forms & checklists)
- equipment
- infrastructure
- signage
- staff training

Sea-cage Biosecurity Plan – Hazard ID

Transmission ?
- *Horizontal / vertical*
- *Survival outside host*
- *Environmental*

Sea-cage Biosecurity Plan – Hazard ID

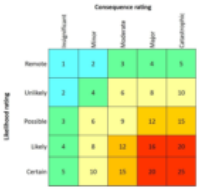
Sea-cage Biosecurity Plan – risk assessment



- Animals (stock / wildlife)
- People
- Equipment, vehicles, vessels
- Water / Waste / Feed

Sea-cage Biosecurity Plan – risk assessment

Step 2	Consider the major transmission routes onto, within and from your farm



Risk level	Explanation and management response
1-2 Negligible	Acceptable level of risk. No action required.
3-5 Low	Acceptable level of risk. On-going monitoring may be required.
6-10 Medium	Unacceptable level of risk. Active management is required to reduce the level of risk.
12-15 High	Unacceptable level of risk. Intervention is required to mitigate the level of risk.
16-25 Extreme	Unacceptable level of risk. Urgent intervention is required to mitigate the level of risk.

We need to capture this at a sector-level (guidelines)

Each farm would need to do their own Risk Assessment
** every farm is different*

Risk Assessment

STEP 1 → Identify the hazards
STEP 2 → Undertake risk assessment

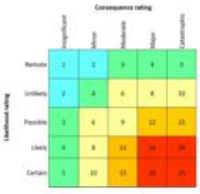
- Animals (stock / wildlife)
- People
- Equipment, vehicles, vessels
- Water / Waste / Feed

Likelihood

Level	Descriptor
Remote (1)	Never heard of, but not impossible here (occurs less than once in 20 years)
Unlikely (2)	May occur here, but only in exceptional circumstances – occurs more than once in 20 years
Possible (3)	Clear evidence to suggest this is possible in this situation – occurs more than once in 3 years
Likely (4)	It is likely, but not certain, to occur here – occurs more than once in 2 years (~50%)
Certain (5)	It is almost certain to occur – occurs nearly every year

Consequence

Level	Descriptor
Insignificant (1)	Impact not detectable or minimal
Minor (2)	Impact on farm productivity limited to some production units or short term only
Moderate (3)	Widespread impact on farm productivity due to increased mortality or decreased performance
Major (4)	Considerable impact on farm production resulting in serious supply constraints and financial impact
Catastrophic (5)	Complete depopulation of the farm and possibly barriers to resumption of production



Risk Assessment

STEP 3 → Identify risk management measures
STEP 4 → Document the risk analysis process

Hazard	Likelihood	Consequence	Unmodified risk rating	Management response & control measures	Modified risk rating
Entry and spread of "disease X" onto and within the farm	Possible The disease is endemic and has occurred in source hatcheries previously	Moderate Destruction of affected stock would be required due to impacts on performance	9—Medium	Mitigation measures are required to reduce risk. Likelihood reduced by sourcing stock only from hatcheries with a health accreditation scheme Consequences reduced by ensuring all new stock are kept separate from other stock during the susceptible seconds phase Measures reduce risk rating to 4 (low). Modified risk is acceptable	Control measures reduce likelihood to "unlikely" and consequence to "moderate" Measures reduce risk rating to 4 (low). Modified risk is acceptable

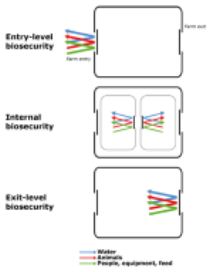
***Example** – guidelines*

***Example** – farm plan*

Risk Pathways – GROUP TASKS

Groups must have a mix of government and industry

- Animals (stock / wildlife)
- People
- Equipment, vehicles, vessels
- Water / Waste / Feed



Group Task

1. Identify the pathways that may spread disease
2. Pathways onto, within and from the farm ?
3. Rank the risk of each (eg low, med, high)
   - previous Risk Assessment ?
   - or group estimate risk level

Risk Pathways – ANIMALS

Fish
- Introduction of Fingerlings (eg local vs interstate)
- Grow out translocation
- Broodstock / wildcaught
- Clinical fish / treatment
- Mortalities
- Processing / blood water
- Escapees
- ……..
- ……..

Other
- Birds / scavengers
- Wild fish species
- Predators (of sick fish – eg blood water / carriers)
- ……
- ……

Group Task

- Identify animals & animal product pathways that may spread disease
- Pathways onto, within and from the farm ?
- Rank risk level for each (eg low, med, high) (previous RA?)

Risk Pathways – PEOPLE

People
- Staff (eg on site vs off site)
- Staff – divers / ornamental fish hobby
- Staff – health team
- Visitors – general
- Visitors – vets from other farm sites
- Contractors
- ……
- ……

How ?
- Visiting other farms on same day
- Movement between sites
- Contaminated clothes / equipment
- ……
- ……

Group Task

- Identify pathways that may spread disease
- Pathways onto, within and from the farm ?
- Rank risk level for each (eg low, med, high) (previous RA?)

Risk Pathways – EQUIPMENT, VEHICLES, VESSELS

Equipment
- Nets
- Harvest / processing
- Feed equipment
- Diving
- Sampling / health check
- ……..
- ……..

Vehicles / vessels
- Farm: feed, health, grading …)
- Farm: movement between sites
- Visitor / tourists
- Processor
- Fishers
- Trespassers
- ……

Group Task
- Identify pathways that may spread disease
- Pathways onto, within and from the farm ?
- Rank risk level for each (eg low, med, high) (previous RA?)

Risk Pathways – WATER, WASTE, FEED

Water
- Fingerling tanks
- Truck water
- Vet. treatment water
- Harvest water
- Vessel (eg wells, bilge)
- Oceanography (disease management zone)
- ……..
- ……..

Waste
- Mortalities (cage, fingerling tank)
- Processing waste
- Over feed
- Dislodged Fouling
- Cleaning effluent
- ……..
- ……..

Feed
- Fresh bait (local vs imported)
- Fresh bait (species risk?)
- Manufactured (quality = health)
- Manufactured (viable pathogen)
- Medicated feed
- Bait from trespassers
- ……..
- ……..

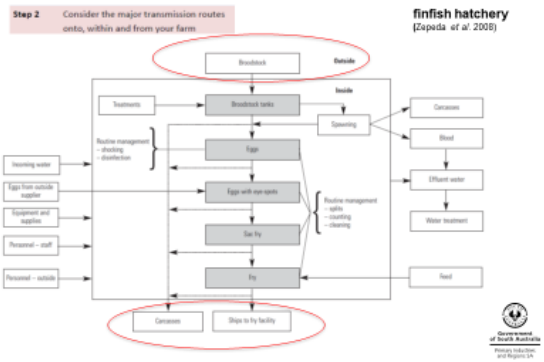
Group Task
- Identify pathways that may spread disease
- Pathways onto, within and from the farm ?
- Rank risk level for each (eg low, med, high) (previous RA?)

Risk pathways

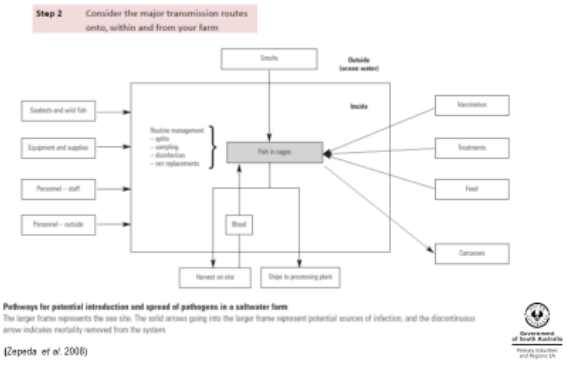
GROUP TASK - DEBRIEF

Groups to present their findings

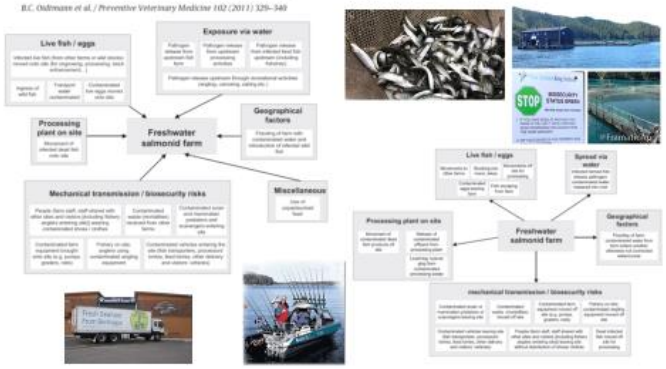
Discussion – have we captured previous work ?



Discussion – have we captured previous work ?



Discussion – have we captured previous work ?



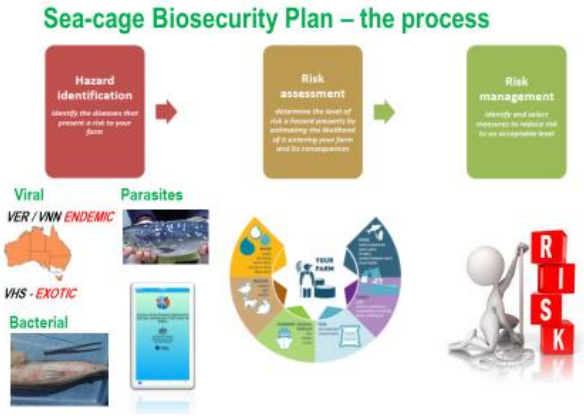
Discussion – have we captured previous work ?

Discussion – have we captured previous work ?

Risks:

- New fingerlings
- Diving between lease sites / cages
- Nets / cages / equipment / vessels between sites
- Mortalities
- Untrained staff
- Staff from a high risk area (eg processor, infected cages)
- Visitors / trespassers
- Stocking densities / water quality
- Distance between sites
- Not detecting poor health / disease early
- Feed (non health certified / no risk mitigation)
- Harvest vessels / blood water

Presentation 6



Sea-cage Biosecurity Plan – ID Mitigation

Considerations for devising risk management measures

- The severity of the assessed risk should dictate the extent of measures required.
- Generally:
- More risk means more resources should be put to reduce the risk to acceptable level.

Measures may include:

- Procedures (SOPs)
- Record keeping (forms / checklists)
- Equipment
- Infrastructure
- Signage
- Staff training
- Inter-company agreements within Disease Management Areas (zones)
- Response exercises
- Govt training
- Lab resourcing
- Submissions to Govt

Sea-cage Biosecurity Plan – ID Mitigation

STEP 3 → Identify risk management measures

STEP 4 → Document the risk analysis process

***Example** – guidelines*

***Example** – farm plan*

Risk Management – GROUP TASK #1

Same groups

Each group work on same topic

- Animals (stock / wildlife)
- People
- Equipment, vehicles, vessels
- Water / Waste / Feed

Group Task

- Suggest and discuss risk management measures for each level of risk (Extreme, high, medium, low)
- For the hazards you previously identified, (start with your Extreme / High risks), identify appropriate risk management (ie. Infrastructure, equipment, SOPs, record keeping / forms etc)

Risk Management – ANIMALS

- Health certified stock
- Surveillance / health checks
- SOP's for stock movement (between leases, sites, zones)
- Handling mortalities
- Predator / scavenger nets
- Staff training
- Veterinary medicine treatment
- Processing SOP's
- .....
- Isolate / quarantine sick cages
- Predator / scavenger nets
- .....
- .....

Group Task

- Discuss suggested risk management measures for each level of risk (Extreme, high, medium, low)
- For the hazard pathways you previously identified, (start with your Extreme / High risks), identify appropriate risk management (ie. Infrastructure, equipment, SOPs, records / forms etc)

Risk management – PEOPLE

- Staff restrictions
- Visitor restrictions
- Decontamination requirements
- Protection from trespassers
- Researchers
- Vets
- .....

Group Task

- Suggest and discuss risk management measures for each level of risk (Extreme, high, medium, low)
- For the hazards you previously identified, (start with your Extreme / High risks), identify appropriate risk management (ie. Infrastructure, equipment, SOPs, records / forms etc)

Risk Management – EQUIPMENT, VEHICLES, VESSELS

Equipment

- Dedicated equipment
- Decontamination SOP
- .....
- .....

Vehicles / vessels

- Dedicated vehicles / vessels
- SOP for movement between sites / processor
- Prevention measures for Trespassers / fishers
- Visitor / tourists
- .....

Group Task

- Discuss suggested risk management measures for each level of risk (Extreme, high, medium, low)
- For the hazards you previously identified, (start with your Extreme / High risks), identify appropriate risk management (ie. Infrastructure, equipment, SOPs, records / forms etc)

Risk Management – WATER, WASTE, FEED

Water

- SOP for tank / truck water
- Vet. treatment water
- SOP Harvest water
- SOP & records for Vessel (eg wells, bilge)
- Determine disease management zone
- .....
- .....

Waste

- Regularly remove mortalities Processing waste
- SOP for processing waste
- SOP for fouling / net cleaning
- .....

Feed

- Bait: prioritise local
- Bait: ensure import conditions
- Source from certified Manufacturer
- SOP Feed
- .....
- .....

Group Task

- Discuss suggested risk management measures for each level of risk (Extreme, high, medium, low)
- For the hazards you previously identified, (start with your Extreme / High risks), identify appropriate risk management (ie. Infrastructure, equipment, SOPs, records / forms etc)

Risk Management

GROUP TASK #1 - DEBRIEF

Groups to present their findings

Risks: New fingerlings

- If moving from hatchery to sea-cage, ensure health status is equal or higher than existing grow-out fish population
- Stock fingerlings into a new or a dried and disinfected net
- Fingerlings are visually examined daily, and mortalities are remove daily and recorded
- Water quality is monitored to maintain a low-stress environment
- Manage stocking densities to avoid excess stress and deterioration of water quality

Risks: Nets / cages / equipment / vessels between sites

- Cage netting is maintained with routine cleaning
- Divers are to inspect nets at least twice weekly and close holes to minimise stock escaping.
- Movements from areas of known disease status, or other aquaculture finfish enterprises, to areas of disease-free status should be avoided.
  - If boats or new cages must be moved, then it should be disinfected
    - Slipping the boat, removal of all ropes and replacement with new ropes, and disinfection of the vessel
- Equipment which has been in contact with fish or culture water external to the farm (including contractor equipment or plant), should not be brought into the farm.
  - If there is no alternative, then a thorough cleaning and disinfection protocol must be followed before entry.

Risks: Untrained staff

- Farm appoints a biosecurity manager
- Biosecurity plan and associated documents are accessible to staff
- All staff are provided with a biosecurity induction to the farm biosecurity plan, including the emergency response plan and SOPs.
- Annual training in identification of signs of disease and the steps involved in reporting, recording and investigating disease events
- The training is to be documented in a training log.

Risks: Mortalities

- Any sick or freshly dead fish are investigated, with full field and laboratory diagnostic testing to attempt to identify cause of disease
  - Immediate reporting takes place to appropriate government authority when required.
- Remove, quantify and record stock deaths daily. Dispose of dead stock and biological waste appropriately
- Farm should have equipment and contingency plans to manage high-mortality events,
  - Large airlifts, and prearranged high-volume disposal sites.

Risks: Feed (non health certified / no risk mitigation)

- Live feed cultures (algae and rotifers) are housed in separate and biosecure rooms with dedicated equipment and prevention of aerosol or water transmission to other hatchery zones
- Extruded pellets or irradiated raw feed products [fish or squid] are fed to broodstock
  - When feeding untreated live or frozen raw feed products, feed is sourced from certified target-pathogen-free suppliers, or diagnostic screening is performed before feed entry onto farm
- Details of batch, run and date of manufacture for all feeds are to be recorded
- Record daily feed intake and observations on feeding vigour

Risk Management – GROUP TASK #2

Same groups

<u>Group Task</u>

Each group choose an SOP, Form or Template to work on which have been identified in previous tasks as high priority. Amend to capture specific needs for your sector.

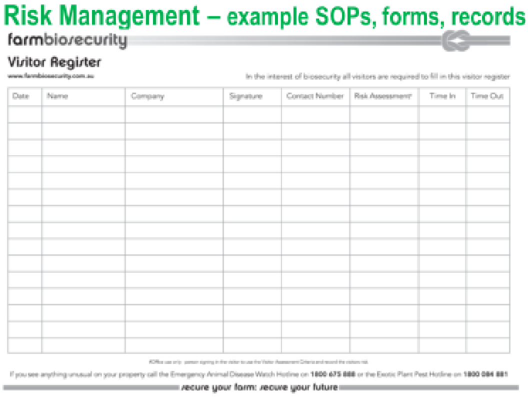
Example:

- SOP – disinfection / decontamination protocols (incl APVMA permit)
- SOP – stock movements
- SOP – disease response plan
- Stock inspection records
- Visitor & staff register and risk assessment

* Templates are available on:
http://www.farmbiosecurity.com.au/toolkit/records/

Other national guidelines

Risk Management – example SOPs, forms, records



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Visitor Register

www.farmbiosecurity.com.au

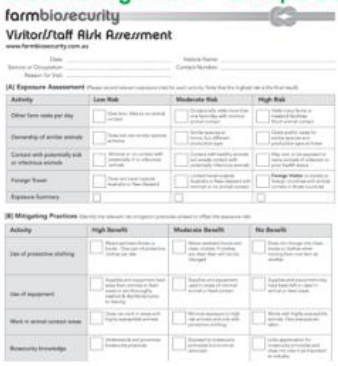
In the interest of biosecurity all visitors are required to fill in this visitor register

Date	Name	Company	Signature	Contact Number	Risk Assessment*	Time In	Time Out

If you see anything unusual on your property call the Emergency Animal Disease Watch Hotline on **1800 675 888** or the Exotic Plant Pest Hotline on **1800 084 881**

secure your farm: secure your future

Risk Management – example SOPs, forms, records



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Visitor/Staff Risk Assessment

www.farmbiosecurity.com.au

Date: Visitors Name:

Service or Occupation: Contact Number:

Reason for Visit:

(A) Exposure Assessment (Please record relevant exposures that for each activity. Note that the highest risk is the final result)

Activity	Low Risk	Moderate Risk	High Risk
Other farm visits per day	One farm, little to no animal contact	Occasionally visits more than one farm/day with moderate animal contact	Visits many farms or livestock facilities. Much animal contact
Ownership of similar animals	Does not own similar species at home	Similar species at home, but different production type	Owns and/or cares for similar species and production type at home
Contact with potentially sick or infectious animals	Minimal or no contact with potentially ill or infectious animals	Contact with healthy animals and possibly contact with potentially infectious animals	May own, or be exposed to many animals of unknown or poor health status
Foreign Travel	Does not travel outside Australia or New Zealand	Limited travel outside Australia or New Zealand with minimal or no animal contact	**Foreign Visitor** or travels to foreign countries with animal contact or those countries
Exposure Summary			

(B) Mitigating Practices (Identify the relevant risk mitigation practices utilised to offset the exposure risk)

Activity	High Benefit	Moderate Benefit	No Benefit
Use of protective clothing	Wears washed boots or boots. Changes shoes/clothes before site	Washes boots and does clean clothes. If clothes are dirty then will not be changed	Does not change into clean boots or clothes when moving from one farm to another
Use of equipment	Supplies and equipment kept away from animals or feed areas or are thoroughly washed & disinfected prior to leaving	Supplies and equipment used in areas of minimal animal or feed contact	Supplies and equipment may have been left in close to animal or feed areas
Work in animal contact areas	Does not work in areas with highly susceptible animals	Minimal exposure to high risk animals and only with protective clothing	Works with highly susceptible animals. Has unacceptable risks
Biosecurity knowledge	Understands and promotes biosecurity practices	Explains to biosecurity principles from a minor perspective	Little appreciation for biosecurity principles and does not see it as important or valuable

Risk Management – example SOPs, forms, records

Emergency Animal Disease (EAD) Action Plan

This document details the actions (and responsibilities) that are to be undertaken in the event that an emergency disease outbreak is suspected on farm.

[A] Important Contact Details

	Name	Contact Number
Property name or PIC number		
Manager		
Person responsible for the EAD Action Plan		
Consultant veterinarian		
District veterinary officer		
Emergency Animal Disease Watch Hotline		1800 675 888

[B] Management Commitment

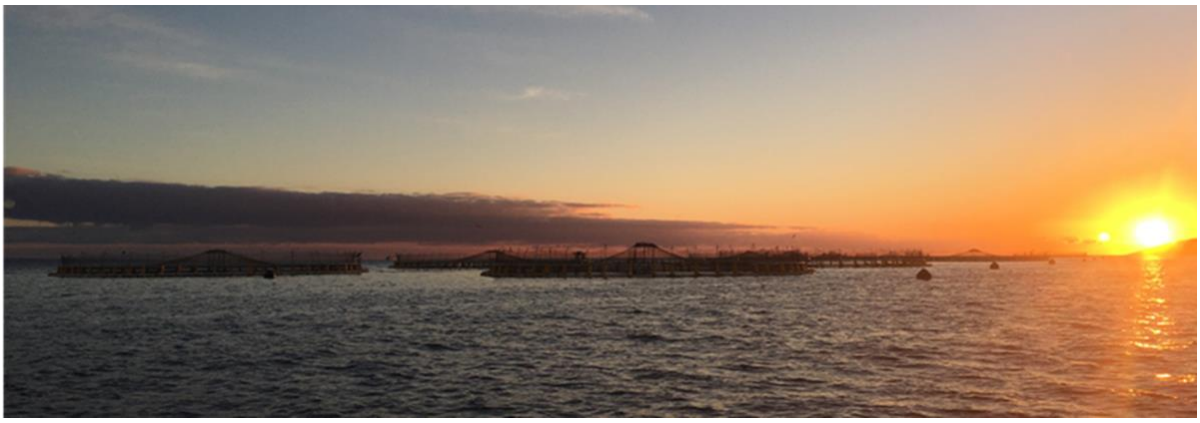
Management undertakes that unfamiliar signs of disease will be investigated, and the following actions undertaken, without delay, if an emergency disease is suspected.

[C] Action Plan

Develop an action plan allocating responsibilities to relevant personnel.

1. Contact the relevant authority through the district veterinary officer or the Emergency Animal Disease Watch Hotline 1800 675 888.
   Responsibility:
2. Follow all instructions as directed by the relevant authority.
   Responsibility:
3. **Do not dispatch any livestock** from the farm until authorised by the relevant authority.
   Responsibility:
4. Ensure suspect livestock are **isolated** within the farm.
   Responsibility:
5. Ensure companion animals of the suspect livestock are **segregated** from other livestock.
   Responsibility:
6. Ensure movement of all other livestock within the farm, and surrounds, is **restricted**.
   Responsibility:
7. Delay or halt the shipment of livestock onto the farm.
   Responsibility:
8. Delay or halt the delivery of all non-essential commodities.
   Responsibility:
9. Secure the farm perimeter, limiting access to the farm and ensuring all vehicles and visitors only enter the farm under controlled conditions.
   Responsibility:
10. Remove unnecessary personnel and machinery from livestock feeding and holding areas.
    Responsibility:
11. Ensure that any personnel, equipment or machinery do not leave the farm until authorised by the relevant authority.
    Responsibility:
12. Compile a list of all livestock (number of head, identification and location), personnel and machinery movements over the past seven days. Prepare a site plan that details current allocations of livestock.
    Responsibility:
13. Ensure all staff are made aware of the actions being taken and their individual responsibilities towards the action plan.
    Responsibility:
14. Ensure that customers are advised if they are immediately affected by the delay in the supply of livestock.
    Responsibility:
15. If an emergency disease is identified, the farm will follow the requirements of the AUSVETPLAN, and directions from the relevant authority.
    Responsibility:

Appendix 3 -
National biosecurity plan guidelines for the Australian sea-cage finfish (non-salmonid) industry



Government of South Australia
Primary Industries and Regions SA

THE UNIVERSITY of ADELAIDE

Future Fisheries VETERINARY SERVICE

FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

Australian Government
Department of Agriculture

AUSTRALIAN SOUTHERN BLUEFIN TUNA INDUSTRY ASSOCIATION LTD (ASBTIA)

CLEANSEAS Australian Kingfish

INDIAN OCEAN FRESH AUSTRALIA

HUON AQUACULTURE

Appendix 3.1 - Biosecurity Sign

Appendix 3.2 – How to Write a Standard Operating Procedure

Appendix 3.3 – Pre-Employment Biosecurity Declaration

Appendix 3.4 – Visitor Biosecurity Declaration

Appendix 3.5 – Visitor Log

Appendix 3.6 – Farm Entry Conditions For Visitors

Appendix 3.7 – Training Record

Appendix 3.8 – Emergency Response Plan Template

Appendix 3.9 – Internal Audit Checklist

FRDC final report checklist

Project Title:	Development of a national sector-specific biosecurity plan guideline and template for the sea-cage finfish (non-salmonid) industry of Australia.		
Principal Investigators:	Principle Investigators: Shane Roberts Co-investigators: Matt Landos, Matthew Bansemer, Brian Jeffriess, Dan Fisk and Erica Starling. Report authors: Shane Roberts, Matthew Bansemer and Matt Landos		
Project Number:	2019/088		
Description:	Biosecurity is crucial for successful aquaculture production. Biosecurity plans describe the systems put in place to protect a farm from the introduction, spread and transmission of diseases. It is important that measures are in place to mitigate disease exposure at each critical control point, including animal movement, people, equipment, water, feed and waste. In this project, guidelines to provide the Australian sea-cage finfish (non-salmonid) industry with the tools and templates to create an auditable farm biosecurity plan were developed. Consideration was given to the current farming of yellowtail kingfish (*Seriola lalandi*), southern bluefin tuna (*Thunnus maccoyii*) and cobia (*Rachycentron canadum*).		
Published Date:		Year:	2020
ISBN:		ISSN:	
Key Words:	Biosecurity plan, disease prevention, southern bluefin tuna, yellowtail kingfish and cobia		

Please use this checklist to self-assess your report before submitting to FRDC. Checklist should accompany the report.

	Is it included (Y/N)	Comments
Foreword (optional)	N	
Acknowledgments	Y	
Abbreviations	Y	
Executive Summary	Y	
– What the report is about	Y	
– Background – why project was undertaken	Y	
– Aims/objectives – what you wanted to achieve at the beginning	Y	
– Methodology – outline how you did the project	Y	
– Results/key findings – this should outline what you found or key results	Y	
– Implications for relevant stakeholders	Y	
– Recommendations	Y	
Introduction	Y	
Objectives	Y	
Methodology	Y	
Results	Y	
Discussion	Y	
Conclusion	Y	
Implications	Y	
Recommendations	Y	
Further development	Y	
Extension and Adoption	Y	
Project coverage	N	
Glossary	N	
Project materials developed	Y	
Appendices	Y	