

# National Biosecurity Plan Guidelines for Farmed Freshwater Native Finfish

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Department of  
Primary Industries



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### About this publication

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## PART 1 GENERAL INFORMATION

### 1 General information

#### 1.1 Introduction

Freshwater finfish aquaculture encompasses the (commercial) production of freshwater native finfish species in various farming operations, including open water ponds and cages to enclosed recirculating aquaculture systems. The main species farmed in Australia include Murray cod (*Maccullochella peelii*), barramundi (*Lates calcarifer*), silver perch (*Bidyanus bidyanus*) and jade perch (*Scortum barcoo*). Several other species are also produced in small quantities (refer to section 1.3 below).

Disease incursions can cause considerable impacts on the production and profitability of aquaculture farms. Not only can disease events cause heavy stock mortalities but fish in poor health have considerably lower growth rates, which increases the time and costs to grow them to a marketable size. Diseased fish also suffer compromised animal welfare, and in some cases, this can lead to changed social perceptions of an industry. Some diseases can disfigure or render the fish unsightly, which reduces their marketability.

Globally, there is increasing risk of significant aquatic animal diseases emerging and spreading due to increasing levels of production, across more locations and involving new species and methods. Increasing movement of seafood, live aquatic animals and associated fishing and aquaculture equipment, both domestically and internationally, is also increasing the risk of diseases spreading. Australia currently has a favorable aquatic animal health status. To maintain this, farmers must work together to implement preventative biosecurity measures, rather than reacting to a disease outbreak.

Biosecurity describes the behaviours, systems and processes put in place to protect farms, the environment and the community from diseases, contaminants and pests. These practices aim to:

- reduce the risk of harmful diseases, contaminants, pests or weeds entering a farm
- reduce the risk of health issues emerging within the farm
- reduce the impacts of disease when it occurs.

Sound biosecurity practices are an essential part of profitable and productive farming systems. Biosecurity practices that minimize disease risks on farm usually cost less than responding to and/or treating a disease outbreak. Moreover, many aquatic animal diseases cannot be effectively treated once established, therefore preventing their entry in the first place is critical. Practicing good biosecurity also has positive effects on farm productivity, animal growth rates and welfare by limiting the impact or spread of a range of diseases that may already be present.

**Staff must understand that by preventing disease introduction, or minimizing disease spread, their jobs and ultimately the industry will be protected.**

#### 1.2 Scope

These guidelines were developed to provide freshwater aquaculture farms with the tools and templates to create an auditable farm biosecurity plan.

Note, these guidelines do not cover barramundi, freshwater salmonid species or aquarium species (such as goldfish). National biosecurity plan guidelines and templates for barramundi are available on the Department of Agriculture, Fisheries and Forestry's [website](#).

These guidelines were developed as part of Fisheries Research and Development Corporation (FRDC) project number 2019-086: *Development of a national sector-specific biosecurity plan guideline and template for the farmed freshwater native finfish industry of Australia* and in accordance with:

- the National Aquaculture Farm Biosecurity Plan: generic guidelines and template (Sub-Committee on Aquatic Animal Health, 2016)
- previously published biosecurity plan guidelines and templates for the land-based abalone, oyster hatchery and barramundi industries (Spark *et al.* 2018a, Spark *et al.* 2018b, Landos *et al.* 2019).

These guidelines are available on Department of Agriculture, Fisheries and Forestry's [website](#).

### 1.3 How to use these biosecurity guidelines

These guidelines are designed to help freshwater native finfish farmers develop a biosecurity plan for their farm and/or strengthen an existing farm biosecurity plan. These guidelines provide information, templates and resources that will assist a farmer to:

- identify and assess biosecurity risks to the farm
- develop a biosecurity plan tailored to their farm.

These guidelines identify the major pathways through which pathogens of disease can be transmitted onto, within and from a farm, including animals, water, equipment, feed, people, and wastes.

This will help you assess:

- the risks associated with each disease transmission pathway
- the biosecurity measures required to minimise the risk(s) of disease transmission
- what other supporting documentation needs to be developed for a comprehensive plan, for example standard operating procedures (SOPs).

Farmers also need to consider any additional risks specific to their property or business, and the associated risk management measures. The number and type of biosecurity risks may vary from one farm to another, due to the unique conditions experienced by each farm.

For example:

- the size of operation
- the type of operation (hatchery, grow-out, recirculating aquaculture system [RAS])
- the farm location and layout
- the disease status of the region or state/territory
- the farm's proximity to wild fish populations, fish processors and/or other aquaculture sites
- the number and type of species farmed
- the available resources.

For this reason, farmers should develop their own individual farm biosecurity plan that considers the farm's uniqueness. Farm biosecurity plans should be practical, simple, and as low cost as possible to achieve the desired outcome.

These guidelines provide supporting documentation that can be tailored to meet farm-specific requirements, including templates and example SOPs (appendices).

Documents, systems, and records that support the biosecurity plan, such as SOPs, do not need to be duplicated within the biosecurity plan, instead they should be referred to within the plan.

Appendix 1 provides a self-audit checklist against which your plan can be assessed; use it to highlight any gaps in your completed plan or to guide its development. Use it regularly to monitor compliance with your completed biosecurity plan and to assess how prepared your business is against potential disease outbreaks.

Symbols used in these guidelines:

**R-numbered statements** are risk-management measures to implement and document. These measures are auditable.



Paper icon indicates **supporting details** and other information to include in a farm biosecurity plan.



Tick on paper icon indicate a **risk management measure (R, followed by a number)** to implement and document. These measures are auditable.



Open file icon indicates **templates** provided to help develop an individual farm biosecurity plan.

Other resources to assist with biosecurity planning are provided in Appendix 2, including links to biosecurity plan templates, supporting manuals and guidelines, useful webpages, and links to relevant state government agencies.

## 1.4 Freshwater finfish aquaculture sectors

Freshwater finfish aquaculture broadly encompasses two sectors, the hatchery sector and the grow-out sector (Table 1). The hatchery sector produces juveniles (fingerlings) for both the grow-out sector and for stocking into the wild, while the grow-out sector produces market-size fish for human consumption.

**Table 1. Freshwater finfish aquaculture sectors, products and culture systems**

| Sector   | Description                                         | Products                                                                                                                                                                                         | Culture system                                                                                                                                                                              |
|----------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hatchery | Hatchery production of juvenile fish (fingerlings). | <ul style="list-style-type: none"> <li>fingerlings for release into the wild for conservation and enhancement of recreational fisheries</li> <li>fingerlings for the grow-out sector.</li> </ul> | <ul style="list-style-type: none"> <li>indoor flow-through tanks</li> <li>recirculation aquaculture systems (RAS)</li> <li>outdoor ponds for holding broodstock and rearing fry.</li> </ul> |
| Grow-out | Grow-out for human consumption.                     | <ul style="list-style-type: none"> <li>market-size fish and fish products.</li> </ul>                                                                                                            | <ul style="list-style-type: none"> <li>indoor flow-through tanks</li> <li>recirculation aquaculture systems (RAS)</li> <li>outdoor ponds</li> <li>cages within ponds.</li> </ul>            |

## 1.5 Freshwater finfish aquaculture species

The hatchery sector mainly produces golden perch, silver perch and Murray cod, while the grow-out sector mainly produces Murray cod, silver perch and jade perch (also known as barcoo grunter). Over the last decade at least 12 other species have been farmed, mostly in the hatchery sector (Table 2).

As previously mentioned, these guidelines do not cover barramundi, freshwater salmonid species or aquarium species (such as goldfish).

**Table 2. Freshwater finfish aquaculture species produced over the last decade (source: state fisheries agencies)**

| Common name        | Scientific name                             | Hatchery (millions of fingerlings/ annum) | Grow-out (t/annum) |
|--------------------|---------------------------------------------|-------------------------------------------|--------------------|
| Murray cod         | <i>Maccullochella peelii</i>                | > 1                                       | > 100              |
| Silver perch       | <i>Bidyanus bidyanus</i>                    | > 1                                       | > 100              |
| Jade perch         | <i>Scortum barcoo</i>                       | 0.1 - 0.5                                 | 50-100             |
| Golden perch       | <i>Macquaria ambigua</i>                    | > 1                                       | < 10               |
| Freshwater catfish | <i>Tandanus tandanus</i>                    | < 0.1                                     | < 10               |
| Trout cod          | <i>Maccullochella macquariensis</i>         | 0.1 – 0.5                                 | -                  |
| Mary River cod     | <i>Maccullochella mariensis</i>             | < 0.1                                     | -                  |
| Australian bass    | <i>Percalates (Macquaria) novemaculeata</i> | Brackish <sup>a</sup>                     | <10                |
| Macquarie perch    | <i>Macquaria australasica</i>               | < 0.1                                     | -                  |



| Common name                     | Scientific name                    | Hatchery (millions of fingerlings/ annum) | Grow-out (t/annum) |
|---------------------------------|------------------------------------|-------------------------------------------|--------------------|
| Olive perchlet                  | <i>Ambassis agassizii</i>          | no data                                   | -                  |
| Southern-purple-spotted gudgeon | <i>Mogurnda adspersa</i>           | no data                                   | -                  |
| Yarra pygmy perch               | <i>Nannoperca obscura</i>          | no data                                   | -                  |
| Murray Hardhead                 | <i>Craterocephalus fluviatilis</i> | no data                                   | -                  |
| Saratoga                        | <i>Scleropages leichardti</i>      | no data                                   | -                  |
| Sleepy cod                      | <i>Oxyeleotris lineolata</i>       | no data                                   | -                  |
| Sooty grunter                   | <i>Hephaestus fuliginosus</i>      | no data                                   | -                  |
| Longfin eel                     | <i>Anguilla reinhardtii</i>        | N/A                                       | <10 <sup>b</sup>   |
| Shortfin eel                    | <i>Anguilla australis</i>          | N/A                                       | 10-50 <sup>b</sup> |

Note: **a** Not applicable as hatchery production occurs in brackish water; **b** Mostly from culture-based fisheries.

## 1.6 Diseases of significance in freshwater finfish aquaculture

The aim of a biosecurity plan is to exclude disease threats from entering, spreading throughout and exiting the farm. This requires knowledge of the diseases that may threaten species grown on farm.

The Australian Government Department of Agriculture, Fisheries and Forestry maintains the [National List of Reportable Diseases of Aquatic Animals](#) (the *National List*). If any of these diseases are present or suspected of being present on your farm, it is compulsory to notify the appropriate government authority. Individual states and territories may also require notification for locally relevant diseases as part of their legislation. These lists can be found on your relevant state/territory websites.

Finfish diseases included on the *National list* and the freshwater finfish species susceptible to those diseases are summarised in Table 3. Other common endemic diseases of freshwater finfish and their susceptible species are list in Table 4. Note, these lists are not exhaustive, as it is possible that there may be other diseases that:

- are rare
- only occurs in some areas and not others
- only affect a small number of hosts.

The number of hosts a disease affects varies (known as host specificity). Some diseases may only affect one host, whereas others may affect many species. For further information on the diseases of freshwater finfish species refer to the [World Organisation of Animal Health Aquatic Code](#) and the relevant species specific literature (for example, Beumer *et al.* 1982, Molnar and Rohde 1988, Langdon, 1989, Rowland and Ingram 1991, Dove and O'Donoghue 2005, Read *et al.* 2007, Herbert and Graham 2008, Boys *et al.* 2012, Bradley *et al.* 2014, Ingram *et al.* 2014, Kayansamruaj *et al.* 2017).

The Australian Government has Department of Agriculture, Fisheries and Forestry developed a field guide to assist with identification of important and reportable diseases. The *Aquatic Animal Diseases Significant to Australia: Identification Field Guide* (5th Edition) is available to view and download on

the department's [website](#). The field guide is also available as a mobile app. Search and learn about aquatic animal diseases that affect finfish, molluscs, crustaceans and amphibians. The app can be freely downloaded through the [App Store](#) (Apple devices), [Google Play](#) (Android devices).

**Table 3. Finfish diseases listed on Australia's National List of Reportable Diseases of Aquatic Animals and their known susceptible farmed freshwater finfish species (excluding barramundi, salmonids and ornamental finfish species)**

| Disease                                                                                 | Exotic to Australia | Susceptible farmed freshwater finfish (FFF) species                                                                                                                                   |
|-----------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Virus</b>                                                                            |                     |                                                                                                                                                                                       |
| Infection with epizootic haematopoietic necrosis virus <sup>a</sup>                     | No                  | <ul style="list-style-type: none"> <li>• Macquarie perch</li> <li>• Silver perch</li> <li>• Murray cod.</li> </ul>                                                                    |
| Infection with infectious haematopoietic necrosis virus                                 | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species <sup>b</sup></li> </ul>                                                                                                 |
| Infection with spring viraemia of carp                                                  | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with viral haemorrhagic septicaemia virus <sup>c</sup>                        | Yes                 | <ul style="list-style-type: none"> <li>• Shortfin eel</li> </ul>                                                                                                                      |
| Infection with viral encephalopathy and retinopathy <sup>c</sup>                        | No                  | <ul style="list-style-type: none"> <li>• Golden perch</li> <li>• Jade perch</li> <li>• Macquarie perch</li> <li>• Murray cod</li> <li>• Silver perch</li> <li>• Sleepy cod</li> </ul> |
| Infectious pancreatic necrosis                                                          | Yes                 | <ul style="list-style-type: none"> <li>• Shortfin eel</li> </ul>                                                                                                                      |
| Infection with infectious salmon anaemia virus                                          | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with red sea bream iridoviral disease <sup>c, d</sup>                         | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with koi herpesvirus disease (Cyprinid herpesvirus 3)                         | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with Singapore grouper iridovirus (ranavirus)                                 | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infectious spleen and kidney necrosis virus – like (ISKNV-like) viruses <sup>c, d</sup> | Yes                 | <ul style="list-style-type: none"> <li>• Golden perch</li> <li>• Macquarie perch</li> <li>• Murray cod</li> </ul>                                                                     |
| Infection with turbot reddish body iridovirus                                           | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with scale drop disease virus                                                 | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Infection with salmonid alphavirus                                                      | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |
| Tilapia lake virus (TiLV) disease                                                       | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                              |

| Disease                                                                    | Exotic to Australia | Susceptible farmed freshwater finfish (FFF) species                                                                                                                                |
|----------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fungi</b>                                                               |                     |                                                                                                                                                                                    |
| Infection with <i>Aphanomyces invadans</i> (epizootic ulcerative syndrome) | No                  | <ul style="list-style-type: none"> <li>• Silver perch</li> <li>• Golden perch</li> <li>• Murray cod</li> <li>• Jade perch</li> <li>• Sleepy cod</li> <li>• Shortfin eel</li> </ul> |
| <b>Bacteria</b>                                                            |                     |                                                                                                                                                                                    |
| Bacterial kidney disease ( <i>Renibacterium salmoninarum</i> )             | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |
| Enteric septicaemia of catfish ( <i>Edwardsiella ictaluri</i> )            | No                  | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |
| Furunculosis ( <i>Aeromonas salmonicida</i> subsp. <i>salmonicida</i> )    | Yes                 | <ul style="list-style-type: none"> <li>• Silver perch</li> <li>• Shortfin eel</li> </ul>                                                                                           |
| <i>Aeromonas salmonicida</i> - atypical strains                            | No                  | <ul style="list-style-type: none"> <li>• Silver perch</li> <li>• Shortfin eel</li> </ul>                                                                                           |
| Enteric redmouth disease ( <i>Yersinia ruckeri</i> – Hagerman strain)      | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |
| Piscirickettsiosis ( <i>Piscirickettsia salmonis</i> )                     | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |
| <b>Protozoan parasite</b>                                                  |                     |                                                                                                                                                                                    |
| Whirling disease ( <i>Myxobolus cerebralis</i> )                           | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |
| <b>Metazoan parasite</b>                                                   |                     |                                                                                                                                                                                    |
| Gyrodactylosis ( <i>Gyrodactylus salaris</i> )                             | Yes                 | <ul style="list-style-type: none"> <li>• No known FFF species</li> </ul>                                                                                                           |

Note: **a** Species which have incomplete evidence for susceptibility of epizootic haematopoietic necrosis include golden perch, freshwater catfish, and southern-purple-spotted gudgeon. **b** No known FFF species means there are no known susceptible farmed freshwater finfish (FFF) species in Australia. However, there may be other species not included within the scope of these guidelines that may be susceptible to the disease, including [barramundi](#) and salmonids. **c** The causative agents of VHS, VER, RSIV, ISKNV and EUS are known to have very broad host ranges. Thus, it is possible these diseases could potentially affect other freshwater finfish species in Australia. **d** Closely related to the sleepy cod (*Oxyeleotris lineolata*), Asian marbled goby (*Oxyeleotris marmorata*) has been shown to be susceptible to both RSIV and ISKNV overseas.

Table 1 was current at the time of publication. For the latest version of the list see [Australia's national list of reportable diseases of aquatic animals](#).

**Table 4. Other common endemic diseases and parasites of farmed freshwater finfish in Australia**

| Disease and parasite      |                                                                                                                           | Susceptible farmed freshwater finfish species                                                            |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Fungi</b>              | <ul style="list-style-type: none"> <li>Infection with <i>Saprolegnia</i></li> </ul>                                       | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
| <b>Bacteria</b>           | <ul style="list-style-type: none"> <li>Infection with <i>Aeromonas</i> spp.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
|                           | <ul style="list-style-type: none"> <li>Epitheliocystis</li> </ul>                                                         | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Flavobacteria</i></li> </ul>                                     | <ul style="list-style-type: none"> <li>Silver perch</li> </ul>                                           |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Streptococcus</i> spp. (Streptococcosis)</li> </ul>              | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Mycobacteria</i> (Myobacteriosis)</li> </ul>                     | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
| <b>Protozoan parasite</b> | <ul style="list-style-type: none"> <li>Infection with <i>Chilodonella</i> spp. (Chilodonellosis)</li> </ul>               | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> <li>Golden perch</li> </ul> |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Trichodina</i> spp. (Trichodinosis)</li> </ul>                   | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> <li>Golden perch</li> </ul> |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Ichthyobodo necator</i> (Ichthyobodoosis)</li> </ul>             | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> <li>Golden perch</li> </ul> |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Ichthyophthirius multifiliis</i> (Ichthyophthiriasis)</li> </ul> | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> <li>Golden perch</li> </ul> |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Tetrahymena</i> spp. (Tetrahymenosis)</li> </ul>                 | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> <li>Golden perch</li> </ul> |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Henneguya</i> spp.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Silver perch</li> <li>Golden perch</li> </ul>                     |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Coccidia</i> spp. (Coccidiosis)</li> </ul>                       | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Golden perch</li> </ul>                       |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Ambiphyra</i> spp.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Silver perch</li> </ul>                       |
|                           |                                                                                                                           |                                                                                                          |
| <b>Metazoan parasite</b>  | <ul style="list-style-type: none"> <li>Infection with <i>Lernaea</i> spp.</li> </ul>                                      | <ul style="list-style-type: none"> <li>Murray cod</li> <li>Golden perch</li> </ul>                       |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Dermoergasilus</i> spp.</li> </ul>                               | <ul style="list-style-type: none"> <li>Murray cod</li> </ul>                                             |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Ergasilus</i> spp.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Silver perch</li> </ul>                                           |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Lepidotrema bidyana</i></li> </ul>                               | <ul style="list-style-type: none"> <li>Silver perch</li> </ul>                                           |
|                           | <ul style="list-style-type: none"> <li>Infection with <i>Camallanus</i> nematode</li> </ul>                               | <ul style="list-style-type: none"> <li>Jade perch</li> </ul>                                             |

Source: Beumer *et al.* 1982, Molnar and Rohde 1988, Rowland and Ingram 1991, Dove and O'Donoghue 2005, Read *et al.* 2007, Boys *et al.* 2012, Bradley *et al.* 2014, Ingram *et al.* 2014.

## 1.7 Major pathways for disease transmission

Diseases can enter and exit your farm via many different routes. These routes need to be considered to manage the risk of diseases entering the farm, spreading within the farm and leaving your farm.

Pathways that place high levels of pathogens in close contact with susceptible hosts are most likely to result in infectious disease. These high-risk pathways need to be identified and addressed as a priority.

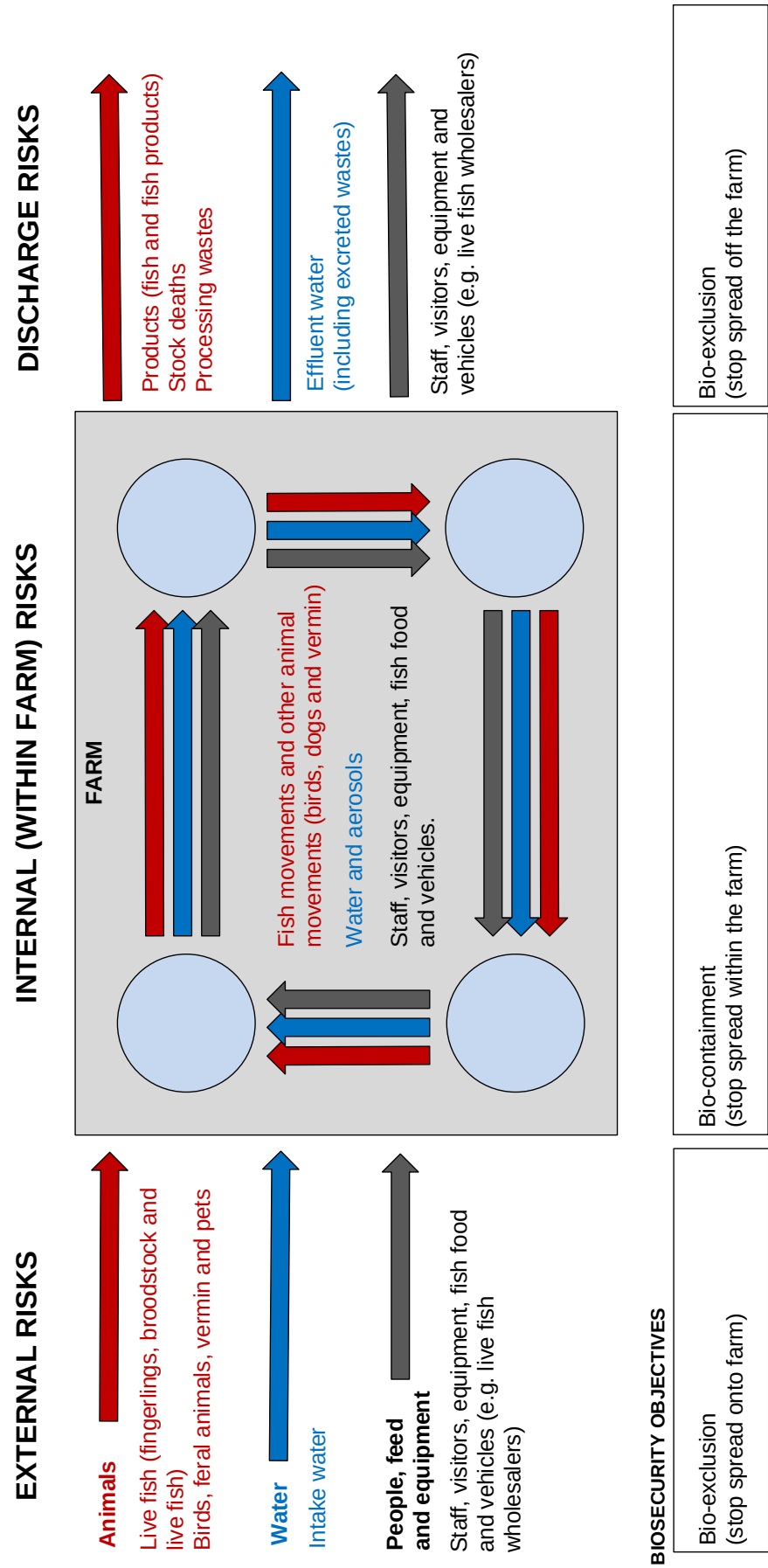
Table 5 and Figure 1 highlight the main pathways through which pathogens and diseases can be transmitted onto, within and from your farm.

**Table 5. Pathways of pathogen and disease transmission onto, within and from aquaculture farms**

| Route of transmission                | Examples                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Onto the farm:</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Animals                              | <ul style="list-style-type: none"> <li>live fish (stock) (for example, eggs, fingerlings and broodstock)</li> <li>other animals (for example, aquatic animals entering with intake water, birds, feral animals, vermin, scavengers and pets)</li> <li>animal products (for example, harvested and processed at other sites)</li> <li>live, fresh or frozen animals <sup>a</sup> and part of animals used as feeds.</li> </ul> |
| Water                                | <ul style="list-style-type: none"> <li>intake water.</li> </ul>                                                                                                                                                                                                                                                                                                                                                               |
| People, feed, equipment and vehicles | <ul style="list-style-type: none"> <li>contaminated skin, clothing and footwear of staff, contractors, visitors, and unauthorised entrants</li> <li>fish food</li> <li>equipment and vehicles (for example, live fish wholesalers <sup>a</sup>).</li> </ul>                                                                                                                                                                   |
| <b>Within the farm:</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Animals                              | <ul style="list-style-type: none"> <li>fish movements between areas and facilities</li> <li>movement of other animals (birds, pets, and vermin).</li> </ul>                                                                                                                                                                                                                                                                   |
| Water                                | <ul style="list-style-type: none"> <li>transfer of water between areas and facilities</li> <li>aerosols (liquid droplets in air).</li> </ul>                                                                                                                                                                                                                                                                                  |
| People, feed, equipment and vehicles | <ul style="list-style-type: none"> <li>movement of staff, contractors, visitors, and unauthorised entrants, fish food, equipment (for example, harvesting, grading and feeding equipment) and vehicles (for example, boats, cars, trucks and tractors) between areas and facilities.</li> </ul>                                                                                                                               |
| <b>From the farm:</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Animals                              | <ul style="list-style-type: none"> <li>products (fish, and fish products)</li> <li>escaped fish</li> <li>stock deaths.</li> <li>processing wastes.</li> </ul>                                                                                                                                                                                                                                                                 |
| Water                                | <ul style="list-style-type: none"> <li>effluent water, including excreted wastes.</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| People, equipment and vehicles       | <ul style="list-style-type: none"> <li>staff, contractors, visitors, and unauthorised entrants, equipment and vehicles (for example, live fish wholesalers).</li> </ul>                                                                                                                                                                                                                                                       |

Note: <sup>a</sup> including ornamental fish species.

Figure 1. Pathways of pathogen and disease transmission onto, within and from aquaculture farms



## 2 GENERAL FARM INFORMATION

This section provides guidance on the enterprise (farm) and infrastructure. It will help you to identify the details of your biosecurity plan and determine how best to manage biosecurity on your farm. You may need to review your biosecurity plan if any changes occur to the farm or its infrastructure.

### 2.1 Enterprise Name



Provide relevant information about the enterprise, including the name on aquaculture permit, the trading name, and any other associated permits (for example, aquaculture, EPA, and food authority permits).

### 2.2 Key Farm Contacts



Provide relevant enterprise contacts (name and contact numbers) including the aquaculture permit holder, farm manager and farm veterinarian.

**Table 6 Examples farm contact lists**

| Internal farm contacts |                               |       |       |
|------------------------|-------------------------------|-------|-------|
| Name                   | Position/Role                 | Phone | Email |
|                        | Company Owner/general manager |       |       |
|                        | Farm permit holder            |       |       |
|                        | Farm manager                  |       |       |
|                        | Operations manager            |       |       |
|                        | Aquatic animal health manager |       |       |
|                        | Administration manager        |       |       |
| External contacts      |                               |       |       |
| Name                   | Position/Role                 | Phone | Email |
|                        | Farm veterinarian             |       |       |
|                        | Government authority contact  |       |       |
|                        | Farm equipment supplier       |       |       |
|                        | Farm feed supplier            |       |       |
|                        | Live fish transporter         |       |       |

## 2.3 Enterprise location and features



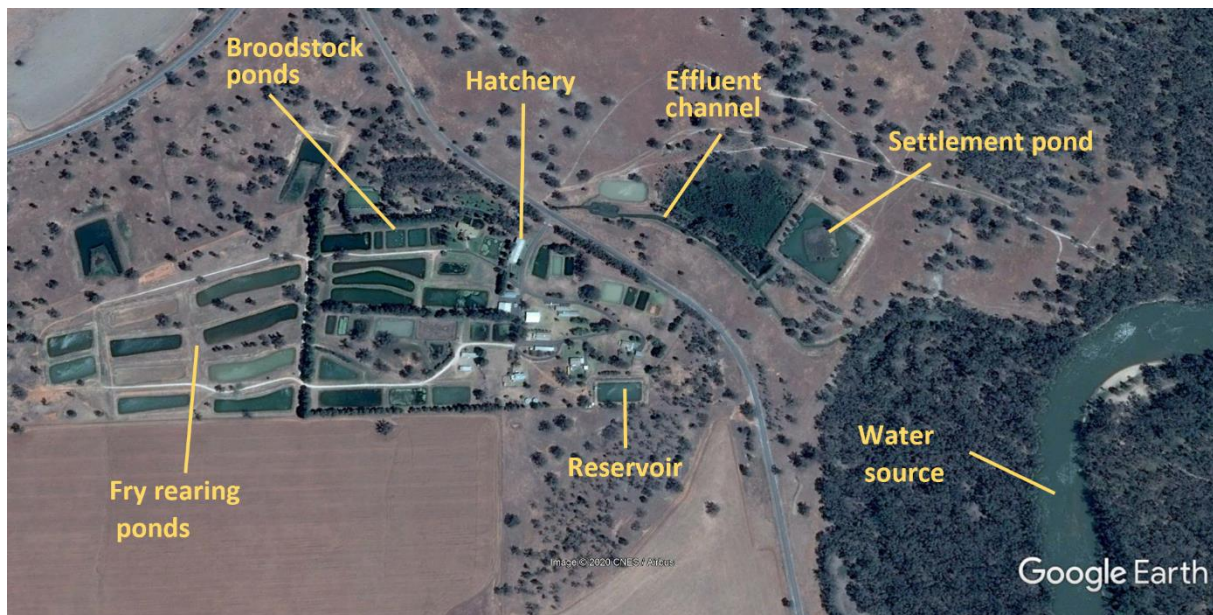
Provide a map or diagram of the enterprise (farm).

The map should present:

- all major facilities (for example, buildings, roads, ponds, water intake and discharge and nearby towns),
- areas (for example, biosecurity zoning)
- significant natural features of the location (for example, adjacent waterway and water body names)
- other aquaculture enterprises nearby.

Ensure maps are large, clear and legible. An example is provided in Figure 2.

**Figure 2. An example of a farm locality map**



## 2.4 Facility layout



Provide detailed (fine scale) maps and diagrams of the facility (for example, engineering/building plans).

Include each building and each system in the map(s), including entry and exit points and major flow patterns (for example, fish movements, and visitor and employee movements) (Figure 3 and **Error! Reference source not found.**). Identify the life stages (eggs, juveniles and adults) found in each system.



## General

The map or diagram should contain the following (as applicable):

- site access points for staff and visitors (including contractors)
- offices (for staff and visitors) and staff amenities
- farm zones (for example, hatchery, nursery, grow-out)
- biosecurity zones and restricted areas (for example, quarantine facilities)
- site security (including the location of lockable doors and gates)
- biosecurity barriers (for example, fencing and biosecurity signage points)
- biosecurity stations (for example, boot-change station, foot baths, and hand-wash).

## People, equipment and feed

The map or diagram should contain the following (as applicable):

- reception points for visitors and contractors
- parking areas
- equipment, machinery and vehicle storage areas
- equipment (for example, nets) and vehicle wash down (disinfection) areas
- feed uploading and storage areas
- allowed staff movements between different biosecurity zones
- vehicle movement patterns and restrictions (entry and exit gates; specify if kept locked).

## Stock

The map or diagram should contain the following (as applicable):

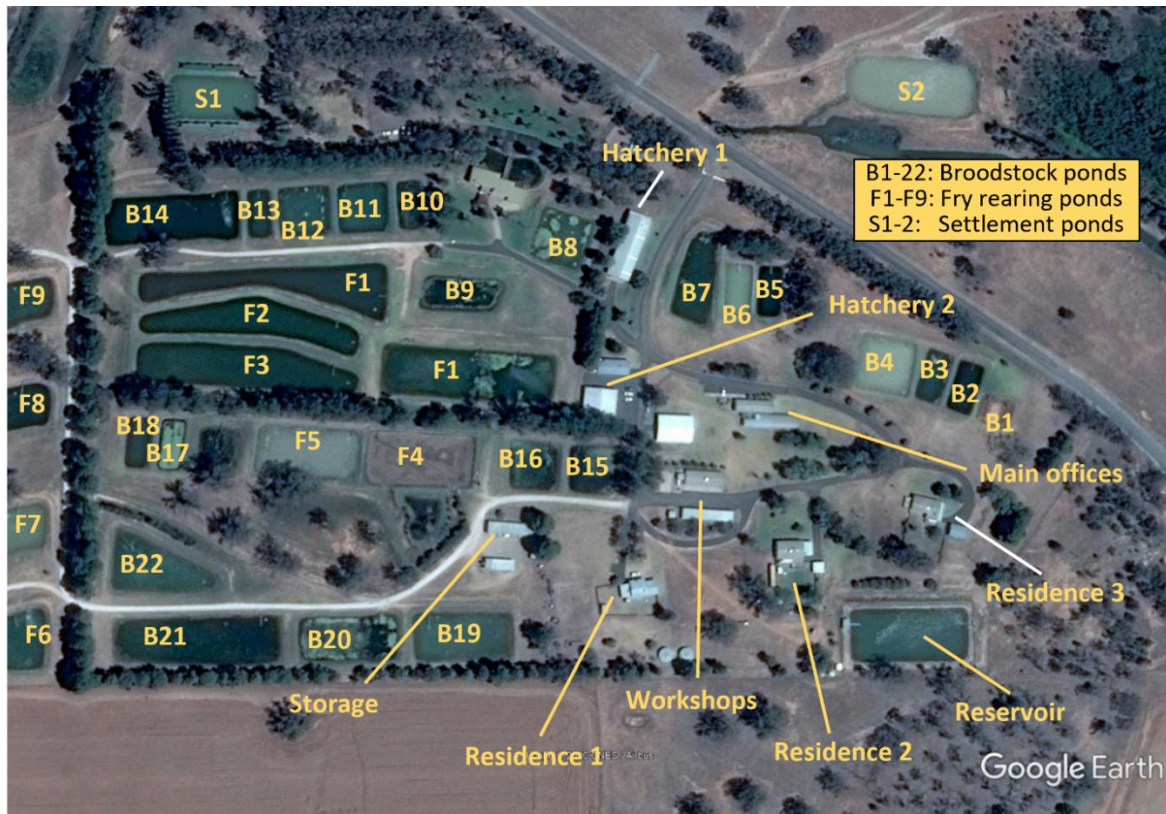
- movement of stock on, around and off the farm (for example, from hatchery to nursery; harvest to processing etc.)
- escape prevention measures (for example, screens on discharge water)
- waste disposal areas and routes.

## Water infrastructure

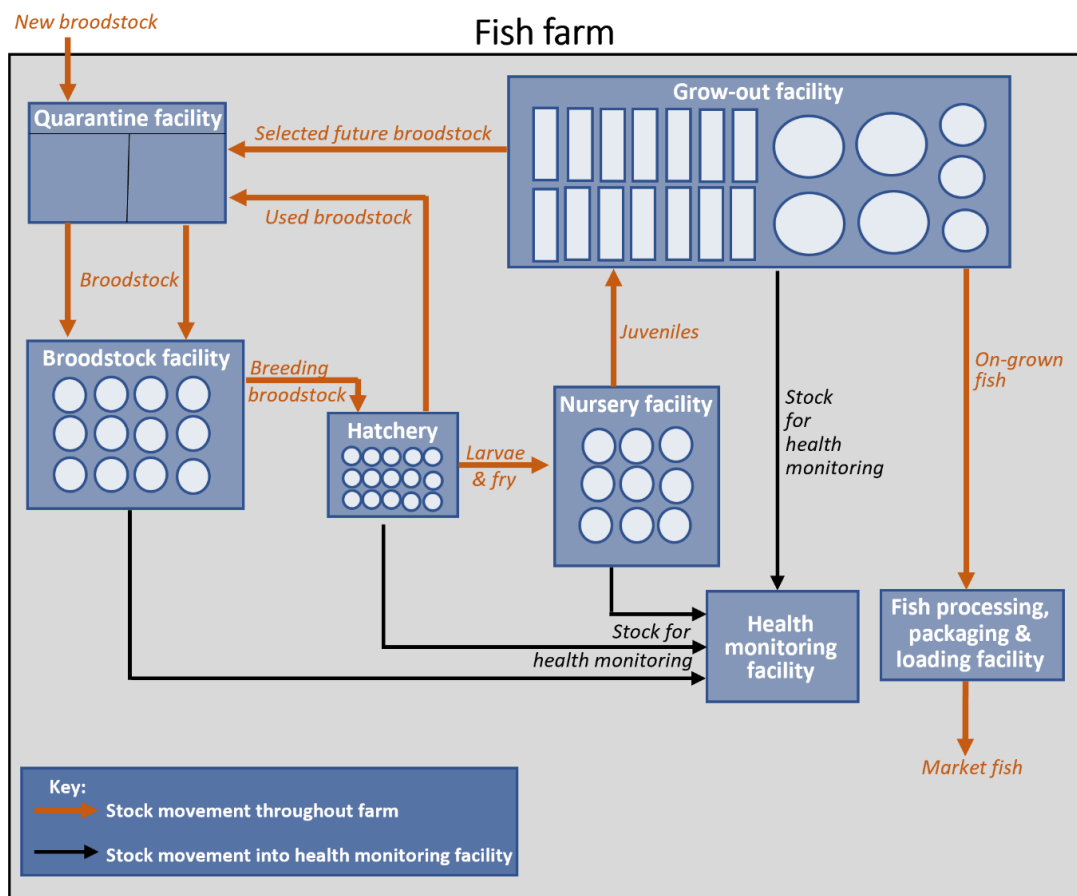
The map or diagram should contain the following (as applicable):

- water storage and disposal areas such as ponds or reservoirs (for example, evaporation basins, wetlands, irrigation pasture)
- the location of water pumps and valves
- water supply intake, treatment and discharge routes and isolation points.

**Figure 3** An example of a farm layout map



**Figure 4** An example of a stock movement diagram



## 2.5 Production details



Provide a detailed description of all relevant elements of the farm production cycle and supply chain.

This may include:

- the source(s) and supplier(s) of all new stock (seedstock and broodstock)
- the quarantine processes
- the breeding cycle
- the nursery and grow-out cycles
- the harvesting and purging processes
- the product, including the species, size and market (for example, farm gate sales and sales to wholesalers)
- other farm activities – all production and administrative activities
- a staff description – number and areas of responsibility
- a description of any associated sites that may be linked to the farm.

## 2.6 Farm biosecurity zones

Farm biosecurity zones represent areas that are both physically (for example, different locations on farm) and functionally separate (for example, hatchery facility, grow-out ponds, purging systems).

These biosecurity zones may have different biosecurity measure(s) (infrastructure and/or sanitary protocols) that prevent transfer of disease between the zones. These areas can be assigned the classifications listed in Table 7.

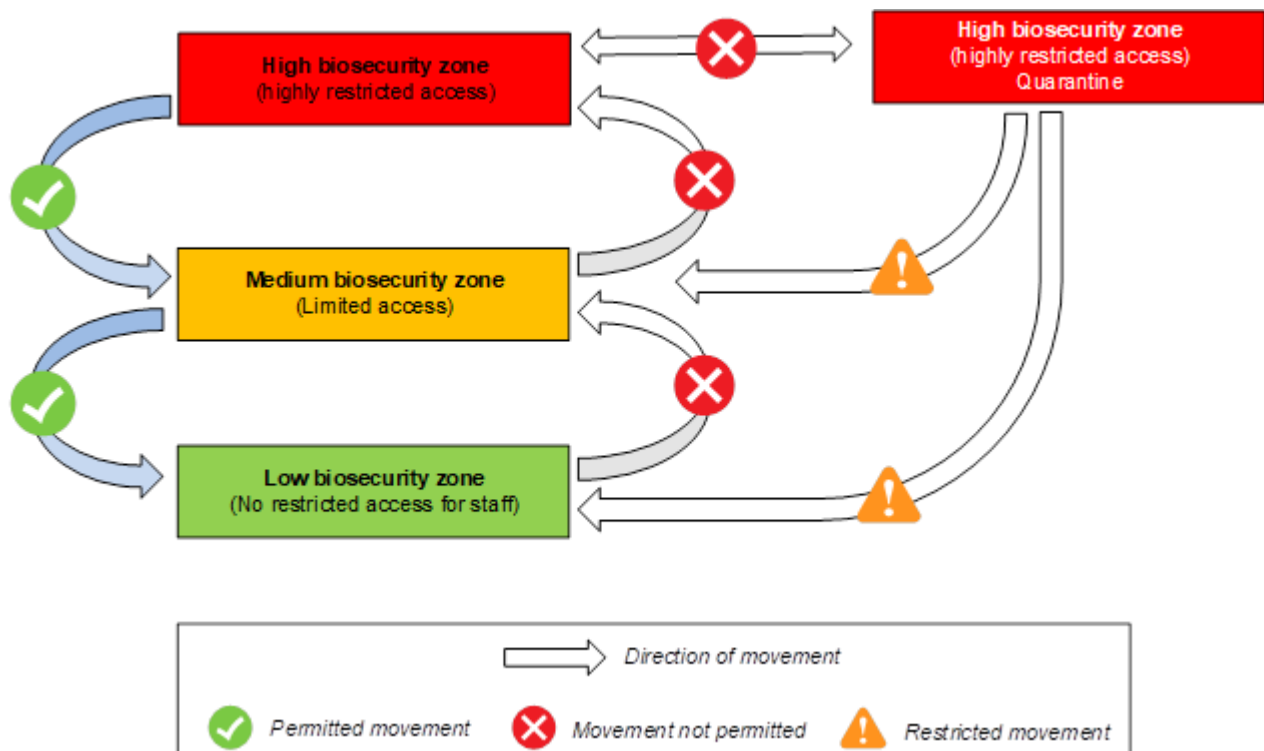
It is important to prioritise and manage the movement of animals, staff, visitors, equipment, and vehicles between zones. Movements should be ordered from low to high risk. Should movement from a higher risk zone to a lower risk zone be required, ensure a risk assessment is prepared to justify the activity.



Appendix 3 includes an example of a biosecurity sign.

**Table 7. Farm biosecurity zone classifications**

| Biosecurity zone                                               | Access                                                                                                                                                                                                                                                                                                        | Examples                                                                                                                                                                                |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>High level biosecurity</b><br>(Most biosecure area)         | <ul style="list-style-type: none"> <li>highly restricted</li> <li>authorised personnel only</li> <li>no entry after visiting other areas of the farm.</li> </ul>                                                                                                                                              | <ul style="list-style-type: none"> <li>fully enclosed broodstock room on RAS with sanitised water source</li> <li>hatchery</li> <li>quarantine area where new stock is held.</li> </ul> |
| <b>Medium level biosecurity</b><br>(Moderately biosecure area) | <ul style="list-style-type: none"> <li>limited access</li> <li>authorised personnel only</li> <li>staff can move from the high-level biosecurity zone to this area, but not back again</li> <li>limited access for visitors &amp; contractors - pending biosecurity entry assessment and approval.</li> </ul> | <ul style="list-style-type: none"> <li>nursery</li> </ul>                                                                                                                               |
| <b>Low level biosecurity</b><br>(Low level biosecurity only)   | <ul style="list-style-type: none"> <li>no restrictions for staff</li> <li>limited access for visitors &amp; contractors - pending biosecurity entry assessment and approval.</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>grow-out ponds</li> </ul>                                                                                                                        |

**Figure 5. Restrictions on movement between different biosecurity zones**

Risk management measures for consideration:



**R.1** Farm has a secure perimeter or otherwise well-defined boundary, establishing a clearly defined biosecurity zone.



**R.2** Farm access gates are lockable and locked when no staff are on site.



**R.3** Farm has designated biosecurity zones with zone-specific requirements for access, traffic direction, entry and exit procedures and dedicated equipment.



**R.4** Clearly displayed biosecurity zone signage at the entry and exit points, consistent with biosecurity zone definitions and familiar to all staff.

## PART 2 BIOSECURITY PLAN GUIDELINES

This section provides guidelines for developing a farm biosecurity plan.

### 3 BIOSECURITY RISK ANALYSIS

Risk analysis is a widely accepted process for:

- evaluating biosecurity risks that could negatively impact an enterprise
- helping to avoid or mitigate those risks.

The risk analysis process helps focus a biosecurity plan on the highest risks that need the greatest investment to get the maximum protection from these risks. The four steps involved in the biosecurity risk analysis process are presented in Figure 4.

**Figure 4. Four steps of conducting biosecurity risk analysis.**



#### 3.1 Step 1: Identify hazards

Identify the hazards (pathogens, pests, etc.) that could potentially adversely affect the health of your stock and farm productivity. These hazards may include:

- damaging pathogens that do not occur on the farm and that are best excluded from the farm
- pathogens that are known to occur on the farm and that must be managed to mitigate production impacts.

Hazards will vary with location and with the species being farmed and may be a combination of both endemic and exotic pathogens (Table 3 and Table 4). Your farm veterinarian can assist with identifying these hazards.

The outcome of the hazard identification step will be a list of pathogens that will form the basis of the risk assessment undertaken in step 2: Risk assessment of hazards.

#### 3.2 Step 2: Risk assessment of hazards

A risk assessment of the identified hazard is undertaken by assessing two factors:

- 1) the *likelihood* of the hazard entering or occurring on the farm.
- 2) the *consequence* of that hazard entering or occurring on the farm.

##### Likelihood

The *likelihood* of the pathogen entering or occurring on the farm can be estimated by considering the pathways necessary for:

- the entry and spread of the pathogen
- exposure of susceptible stock to the pathogen.

For example, the likelihood of entry and exposure might be ‘certain’ for a pathogen that occurs in untreated intake water, such as *Chilodonella spp.* Similarly, pathways involving infected live fish have the highest likelihood of entry and exposure because they may carry large quantities of viable pathogen.

The likelihood rating will vary depending on:

- the properties of the pathogen
- the occurrence of the pathogen outside of the farm (or in nearby farms)
- the possible pathways of entry onto the farm.

Likelihood ratings and descriptors are shown in Table 8.

**Table 8. Assessment of hazard likelihood**

| Likelihood rating<br>(Rating score) | Descriptor                                                                                                                           |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Remote (1)                          | Hazard (pathogen, disease and/or parasite) never heard of in this situation, but not impossible (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 that occurrence 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 certain to occur – occurs every year.                                                                                          |

## Consequence

The *consequence* of the pathogen entering or occurring on the farm can be estimated by considering the impacts of the pathogen on the productivity of your farm. The consequences could include multiple aspects of production. For example:

- increased mortality
- reduced growth or food conversion
- reduced product quality or market access
- increased treatment costs.

Consequence ratings and descriptors are shown in Table 9.

**Table 9. Assessment of hazard consequences**

| Consequences rate (rating score) | 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 estimation

Risk is estimated as a product of *likelihood* and *consequence*, which results in a risk rating of 1–25 (Figure 6). Risks are highest when both likelihood and consequence are high; however, risks may be low even if the consequence is ‘catastrophic’, as the likelihood may be ‘remote’ for that pathogen. Similarly, even if likelihood is ‘certain’, the consequence may be ‘insignificant’.

Risk ratings are determined by applying estimates of likelihood (where 1 is remote and 5 is certain) and consequence (where 1 is insignificant and 5 is catastrophic) to a risk estimation matrix (Figure 6).

**Figure 5. Risk estimation matrix (colour code detailed in Table 10).**

|                          |          | <b>Consequence rating</b> |       |          |       |              |
|--------------------------|----------|---------------------------|-------|----------|-------|--------------|
|                          |          | Insignificant             | Minor | Moderate | Major | Catastrophic |
| <b>Likelihood rating</b> | Remote   | 1                         | 2     | 3        | 4     | 5            |
|                          | Unlikely | 2                         | 4     | 6        | 8     | 10           |
|                          | Possible | 3                         | 6     | 9        | 12    | 15           |
|                          | Likely   | 4                         | 8     | 12       | 16    | 20           |
|                          | Certain  | 5                         | 10    | 15       | 20    | 25           |

Note: likelihood and consequence are assessed independently of one another and then multiplied to give the risk estimate. For example, the likelihood of a given hazard occurring is 2 (unlikely) and the consequence of it occurring is 4 (major). Multiplying the likelihood ‘2’ by the consequence ‘4’ gives a risk rating of 8 for that hazard, which equates to a medium risk level (Table 10).



The management response required is based on the overall level of risk. Levels of risk can range from 'Negligible' requiring no immediate action (risk levels 1 to 2) to 'Extreme' requiring urgent action (risk levels 16 to 25) (Table 10).

**Table 10 Risk estimation matrix levels and management responses**

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

### 3.3 Step 3: Identify risk management measures

Once risk ratings for the identified hazards have been completed, measures (actions) to reduce the risk from these hazards to an acceptable level are identified and prioritised for action (starting with the hazards with the highest risk ratings). The preferred management measure(s) applied to each hazard should be chosen based on practicality, effectiveness and cost. Management measures may include:

- physical (for example, infrastructure and equipment)
- procedural (for example, production practices and training)
- other supporting measures (for example, signage).

When a management measure is identified, a Standard Operating Procedure (SOP) should be written to detail the exact functioning of the measure. The farm biosecurity plan then only needs to refer to the relevant SOP. This step is described further in **Section 4 Mitigation measures to reduce disease transmission routes**.

### 3.4 Step 4. Document risk analysis process

The risk analysis process should be documented so that the hazards considered by the risk analysis, the risk ratings applied to those hazards and the management measures that have been applied, can be easily reviewed as a part of routine biosecurity plan monitoring and audit. An example of how the risk analysis process can be concisely recorded is presented in Table 11.

**Table 11. Example of risk analysis recording**

|                                                 |                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hazard</b>                                   | Entry and spread of 'disease X' onto and within the farm.                                                                                                                                                                                                                                   |
| <b>Likelihood</b>                               | 3 (Possible).<br>The disease is endemic and has occurred in source hatcheries previously.                                                                                                                                                                                                   |
| <b>Consequence</b>                              | 3 (Moderate).<br>Destruction of effected stock would be required due to impacts effects on productivity.                                                                                                                                                                                    |
| <b>Unmodified risk rating</b>                   | 9 (Medium)                                                                                                                                                                                                                                                                                  |
| <b>Management response and control measures</b> | Mitigation measures are required to reduce risk.<br><i>Likelihood</i> reduced by sourcing stock only from hatcheries with a health accreditation scheme.<br><i>Consequences</i> reduced by ensuring all new stock are kept separate from other stock during the susceptible juvenile phase. |
| <b>Modified risk rating</b>                     | Control measures reduce likelihood to 2 (unlikely) and consequence to 2 (minor).<br>Measures reduce risk rating to 4 (low).<br>Modified risk is acceptable.                                                                                                                                 |

### 3.5 Develop or identify associated supporting documentation

Support risk management measures with appropriate documentation outlining the detailed risk management measures (for example, standard operating procedures [SOPs], checklists, record keeping templates).

For example, the biosecurity plan may identify a risk management measure of thoroughly cleaning and disinfecting equipment before transfer to another biosecurity zone. Appropriate documentation to support this practice may be in the form of a SOP (Appendix 4), which provides step-by-step instructions to complete the task.

These details do not need to be included in the body of the farm biosecurity plan, but instead reference the appropriate supporting documentation, such as a SOP.



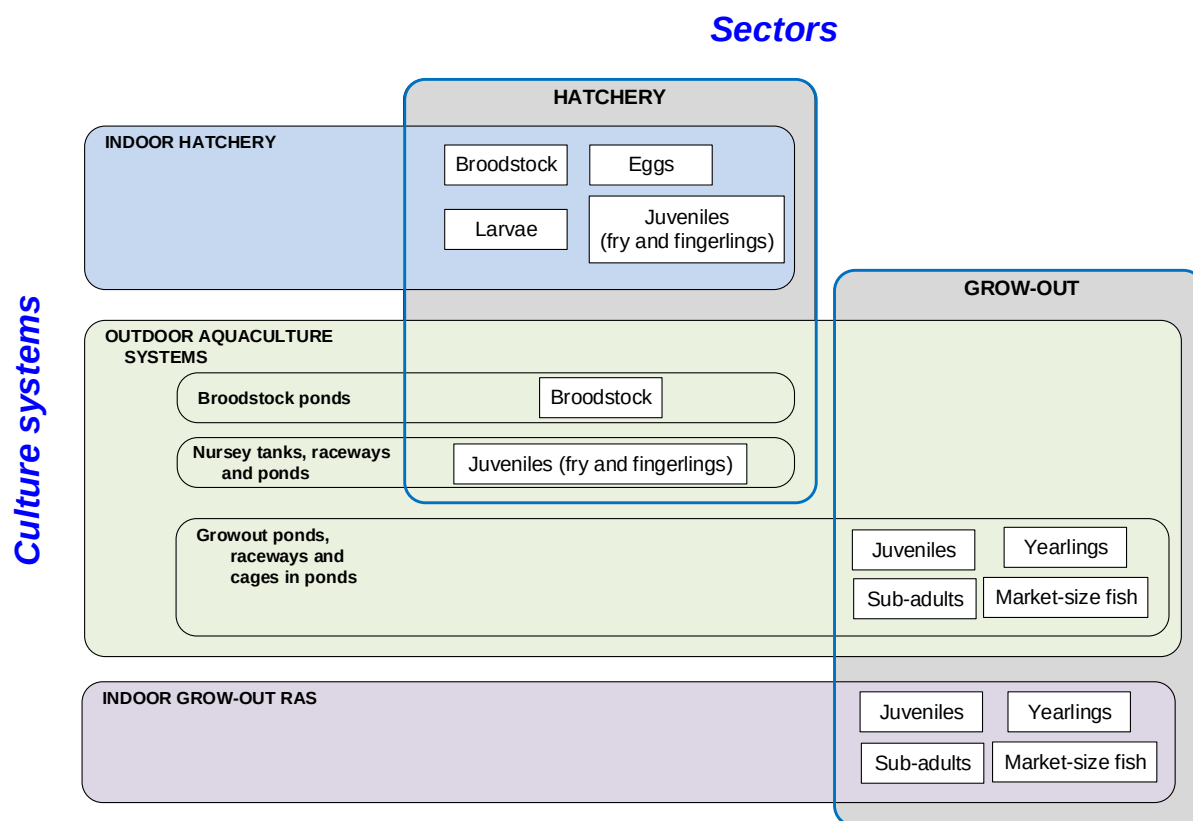
Appendix 4 includes a template for preparing a standard operating procedure (SOP).

## 4 MITIGATION MEASURES TO REDUCE DISEASE TRANSMISSION

This section outlines some of the common risk management measures that can be used to reduce the risk of transmission of disease onto, within and from a farm through various risk activity pathways (Figure 1).

Different management measures may be considered for different sectors and culture systems used in freshwater finfish aquaculture (**Error! Reference source not found.**).

**Figure 7. Different culture systems used in different sectors of freshwater finfish aquaculture**



For example, an indoor hatchery may include different biosecurity zones for different activities, including:

- broodstock quarantine
- broodstock spawning
- live feed culture (algae, rotifers and *Artemia*)
- egg incubation
- larval and fry rearing.

In contrast, an outdoor aquaculture system may include:

- earthen ponds for holding broodstock – these facilities have minimal effluent discharge flows to the environment.
- tanks, raceways and earthen nursery ponds for rearing juvenile (fry and fingerlings) fish - these facilities may be in use seasonally and may have variable water exchange.
- tanks, raceways, earthen ponds and cages in ponds for growing fish to market size (grow-out) - these facilities may be in use seasonally and may have variable water exchange.

An indoor grow-out recirculation aquaculture system (RAS) grows fish intensively in indoor tanks to market size. Tanks are supplied with recirculated water, which is mostly re-used water treated by mechanical and biological filtration and disinfection (for example by ozonation).

The management measures outlined below may not apply to all types of farms or to all situations. Instead, consider which management measure are most relevant to your enterprise and biosecurity plan.

## 4.1 Animals

**Objective: Minimise the risk of stock and other animal movements introducing and spreading disease.**

Stock poses the most significant risk to bringing diseases onto the farm, especially if their health status is unknown. Manage stock introduction and movement carefully to minimise this risk.

Table 12 provides a summary of risk management measures for stock and animal movements. These measures are intended to cover the farming enterprise as a whole.

**Table 12. Risk management measures for stock and animal movement**

| Risk management measures                                                            |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>New stock</b>                                                                    |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|  | <b>R.5</b> | The farm has a dedicated fish delivery and loading area that is separate to the production areas. The area can be disinfected to avoid fish transporters entering the production air space or shed (for example, a concrete slab).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  | <b>R.6</b> | Health status information and appropriate permits are obtained for new stock before entry to farm. The health status of introduced stock should be equal to or better than the stock already present on site.<br><br>This may be achieved by targeted testing for relevant pathogens; selecting stock from disease free populations and ensuring appropriate import or translocation permits are in place for movement of stock.                                                                                                                                                                                                                                                                                  |
|  | <b>R.7</b> | New stock (for example, fingerlings and broodstock) are kept in a biosecure quarantine system on arrival (mandatory). This system is isolated from all other fish populations on-site and is designated a high biosecurity zone.<br><br>Isolate the system from other fish populations on site with biosecurity barriers for all aerosols, water, staff and equipment at the entry and exit points.<br><br>New stock should be kept in this system for a minimum of four weeks to observe for any signs of disease emergence. Under certain circumstances, fish may need to be held for longer dependent on the disease being monitored for. Disinfect and dry-out the quarantine system between batches of fish. |

## Risk management measures



- R.8** Fish are stocked into tanks, raceways and/or cages that have been cleaned, disinfected and dried before stocking.



- R.9** Fish batches (for example, year classes) should be kept separate as they move through the phases of production. This allows for an all-in/all-out management to be implemented to minimise disease transmission.

## Husbandry and Welfare



- R.10** Barriers (such as screens) are installed on all discharge pipes to prevent stock from escaping from holding facilities (tanks, ponds, raceways and cages) and the farm.



- R.11** Stock stress levels are kept to a minimum by ensuring appropriate water quality, hygiene, stocking density, nutrition and handling.



- R.12** Stock are treated, as appropriate, for ectoparasites and endoparasites under the guidance of a farm veterinarian prior to entry on site. This includes all new stock coming onto the farm.

## Monitoring



- R.13** Fish are regularly visually examined (daily for fish in tanks and cages).  
Unusual observations in behaviour and appearance are recorded and reported, and any sick or freshly dead broodstock are investigated, with guidance from the farm veterinarian and government authority.



- R.14** Microscopic surveillance is routinely performed for ectoparasite infestations.  
Surveillance is undertaken regularly (at least weekly) and before stocked are moved to another biosecurity zone within the farm. Treatment is provided to control ectoparasite risks under guidance of the farm veterinarian.



- R.15** Health problems (suspected diseases) are investigated with assistance from aquatic animal health professionals, including full field and laboratory diagnostic testing to attempt to identify the cause of the disease.

## Mortalities



- R.16** In accordance with jurisdictional requirements, the relevant authorities are notified immediately of any significant, unexplained mortality event or suspected infectious or reportable disease via the Emergency Animal Disease Reporting Hotline (1800 675 888).



- R.17** Fish deaths (daily and cumulative mortalities) are recorded, and dead stock are removed daily. Reporting requirements for mortalities should be checked against jurisdictional requirements.



- R.18** Mortalities or unwanted stock are disposed of in an appropriate manner that is approved by the relevant jurisdictional authority.  
Ensure there is no risk of pathogen release from the dead stock into waterways or farmed fish, and there is no access for bird, mammal or invertebrate scavengers that could spread a disease.



- R.19** The farm has equipment and contingency plans to manage high-mortality events; for example, large airlifts and prearranged high-volume disposal sites.

## Risk management measures

### Other species



- R.20** Different aquaculture fish species are cultured in separate tanks, cages and ponds and are not mixed. The tanks/cages/ponds do not share water across species.

This is important because there could be common parasitic, bacterial or viral diseases that could spread across species (such as white spot), or unique diseases.



- R.21** Other animals (pets, vermin and scavengers) are excluded from all high and moderate biosecurity zones at all times. Vermin are controlled as appropriate.

### Hatcheries



- R.22** Eggs are disinfected with a permitted or approved sanitiser.

## 4.2 People

**Objective: Minimise the risk of people movement introducing and spreading disease.**

The risk of people introducing disease to your farm is greatest if they have recently visited other farms, or environments potentially containing diseases of concern (including processors and ornamental fish businesses). Contaminated skin, clothing and footwear can all potentially spread disease. Visitors may include suppliers and other service personnel, family and neighbours.

Table 13 provides a summary of risk management measures for staff and visitors. These measures are intended to cover the farming enterprise as a whole.

**Table 13. Risk management measures for staff and visitors**

## Risk management measures

### Staff



- R.23** Staff must follow the farm's biosecurity workflow – moving unidirectionally from highly biosecure areas to low biosecurity areas. Where movement from low to high areas is unavoidable staff must follow the appropriate decontamination procedure.



- R.24** Staff must follow the routine disinfection entry protocol, including:
- wearing freshly laundered clothes daily
  - changing into clean farm-supplied boots
  - using the footbath and sanitising hands when entering and exiting



- R.25** Staff must follow the decontamination protocols (as per the SOP) when moving between the high biosecurity zones (for example, quarantine area) to the low biosecurity zones (for example, grow-out area).



- R.26** Staff are not permitted to visit other aquaculture sites, seafood processors, ornamental fish businesses or undertake recreational or commercial fishing activities before entering the farm (unless they have followed your SOP to mitigate disease risks, including appropriate decontamination where required).

## Risk management measures

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- R.27** Only authorised staff may enter the high biosecurity zones.

### Visitors and contractors



- R.28** Visitor and contractor vehicles must be parked in an isolated dedicated parking area.  
This area is preferably away from high and medium biosecurity zones and fish loading areas.



- R.29** Signage that provides directions for visitors, and includes company contact details, is clearly displayed.



- R.30** All visitors and contractors must:
- be approved by the farm manager for entry
  - complete the visitor log and biosecurity questionnaire
  - sign a declaration before entering the farm.

Visitors who are assessed as high risk will not be allowed entry.



- R.31** Visitors and contractors granted access to the farm must:
- undergo a farm biosecurity induction, at which entry requirements are explained.
  - follow the routine disinfection entry protocol
  - follow the farm biosecurity workflow



- R.32** Visitors must always be accompanied by a staff member. Contractors may be left to work unaccompanied once they have been inducted.
- Note: access to the low and medium biosecurity zones is limited for visitors and contractors. Access to the high biosecurity zones (for example hatchery and quarantine zones) is avoided wherever possible (Table 7).

---

Supporting documentation for managing staff movement can be found in:



Appendix 5. An example of a *pre-employment biosecurity declaration*.

Supporting documentation for managing visitors and contractors can be found in:



Appendix 6. *Visitor and contractor biosecurity declaration template*.



Appendix 7. *Visitor and contractor log template*.



Appendix 8. *Farm entry conditions for visitors and contractors*.

### 4.3 Equipment, vehicles and vessels

**Objective: Minimise the risk of equipment, vehicle or vessel movement introducing and spreading disease.**

Depending on their history of use, contaminated equipment, vehicles or vessels can carry and spread disease agents. Equipment and vehicles pose the greatest risk of disease transfer if used:

- used off-site (for example, vehicles returning from other farms and fish processors)
- in association with stock, or ornamental or wild fish, especially if these fish are diseased.

Table 14 provides a summary of risk management measures for equipment, vehicles, and vessels. These measures are intended to cover the farming enterprise as a whole.

**Table 14. Risk management measures for equipment, vehicles and vessels**

| Risk management measures                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>R.33</b> Equipment, vehicles and vessels that have been in contact with fish or culture water external to the farm (including contractor equipment or plant) should not be brought onto the farm.</p> <p>If no alternative exists, equipment, vehicles and vessels should be thoroughly cleaned and disinfected as per the disinfection SOP before entry. Where possible, this should be done in a designated area away from high and medium biosecurity zones and fish loading areas.</p> |
|   | <p><b>R.34</b> Movement of equipment, vehicles and vessels should be unidirectional around the farm (from areas of high biosecurity to areas of low biosecurity). Where this cannot occur, equipment, vehicles and vessels must be cleaned and disinfected according to the disinfection SOP.</p>                                                                                                                                                                                                |
|  | <p><b>R.35</b> Vehicles and vessels should be taken to areas containing sick fish last, to minimise the spread of disease to other areas of the farm.</p>                                                                                                                                                                                                                                                                                                                                        |
|  | <p><b>R.36</b> Separate biosecurity zones should have dedicated equipment that is clearly labelled and maintained for exclusive use in each zone. Avoid moving equipment between biosecurity zones.</p> <p>If no alternative exists, equipment that has been in contact with fish or culture water should be thoroughly cleaned and disinfected according to disinfection SOP*) before being transferred to another biosecurity zone.</p>                                                        |
|  | <p><b>R.37</b> Equipment for fish health monitoring and laboratory sample submission is available, calibrated and maintained in a hygienic working order. This includes a compound microscope, dissecting instruments, glass slides, coverslips, petri dishes and preservation fluids.</p>                                                                                                                                                                                                       |
|  | <p><b>R.38</b> Equipment is properly maintained and appropriately cleaned using the cleaning and disinfection procedure (as per SOP*) as required. Ensure maintenance records are maintained and kept up to date.</p>                                                                                                                                                                                                                                                                            |
|  | <p><b>R.39</b> Tank, raceway and cage hygiene is maintained regularly as required.</p> <p>Ensure hygiene and maintenance activities are recorded and kept up to date; for example, removal of wastes, uneaten food, and biofouling organisms such as algal growth. Cage hygiene includes cleaning of mesh to ensure good water flow to fish</p>                                                                                                                                                  |

Note: Appropriate cleaning and disinfection methods are outlined in the [AQUAVETPLAN Operational Procedures Manual – Decontamination](#) on the Department of Agriculture, Water and the Environment's website. Products registered for use as a



disinfectant of equipment and vehicles can be found on the Australian Pesticides and Veterinary Medicines Authority (APVMA) website (<https://apvma.gov.au/>).

## 4.4 Water

### Objective: Minimise the risk of water introducing and spreading disease

Water can pose a significant risk of disease transfer and spread. The level of risk will depend on the source of the water and whether it carries any diseases. This is particularly important if there are susceptible or host species present in the water, or if the farm intake is close to discharge points from other aquatic enterprises or processors.

Table 15 provides a summary of risk management measures for water. These measures are intended to cover the farming enterprise as a whole.

**Table 15. Risk management measures for water**

| Risk management measures                                                            |                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Intake water</b>                                                                 |                                                                                                                                                                                                                                         |
|    | <b>R.40</b> Treat incoming water appropriately to minimise the risk of disease/pest entry onto the farm or spread within the farm. For example, applying screens to intake pipes, and using filtration, and/or disinfection.            |
|  | <b>R.41</b> Monitor disinfection processes such as surface water microfiltration, ozonation or ultraviolet light (or other appropriate methods) to ensure that the process is working effectively.                                      |
|  | <b>R.42</b> Avoid taking in water when signs of disease are visible in the intake water or water source.                                                                                                                                |
|  | <b>R.43</b> Ensure there is no contact/interaction between the farm's intake water and its outflow points to minimize cross contamination.                                                                                              |
|  | <b>R.44</b> Ensure the water flow on the farm minimizes the spread of disease. The intake and outflow points for the different biosecurity zones should be kept separate to minimise the spread of disease and cross contamination.     |
|  | <b>R.45</b> Filtration and sanitation (disinfection) infrastructure is regularly serviced using a maintenance schedule to ensure consistency of performance. Ensure maintenance and service records are maintained and kept up to date. |
|  | <b>R.46</b> Record all changes to tank, pond or raceway flows and/or infrastructure breakdowns.                                                                                                                                         |
| <b>Water quality</b>                                                                |                                                                                                                                                                                                                                         |
|  | <b>R.47</b> Identify water quality levels that provide a low-stress environment for fish and trigger points for management intervention; for example, increase aeration/oxygenation if dissolved oxygen falls below 5.0 mg/L.           |

## Risk management measures



**R.48** Water quality is monitored and recorded in a diary or other appropriate recording system. Water quality may include dissolved oxygen, pH, temperature, TAN, nitrite, nitrate, turbidity, etc.



**R.49** Potable water is available for cleaning and disinfection procedures.

## Wastewater



**R.50** Local regulations, state regulations and permit requirements (for example, the EPA) (including reporting) are followed when disposing of effluent water and other farm wastes.



**R.51** Discharge water from the quarantine facility is appropriately treated to minimise the spread of disease within and from the farm.

Effluent water from the quarantine room can be stored in a separate biosecure location before disinfection or disinfected before discharge from the facility.



**R.52** Ensure there is no open drainage from the quarantine facility to the other areas of the farm prior to disinfection.



**R.53** Where possible, recirculate all effluent water through a constructed wetland to limit exposure to open natural waterways.



**R.54** Where constructed wetland reuse is not available, effluent water should be passed through a settlement pond before discharge or use. Water in the settlement pond may be used for paddock irrigation or run into a securely fenced and netted evaporation pond, or sewer (where permitted).

Ensure the settlement pond has the capacity to be closed off in an emergency to halt all water discharge from the farm (unless high rainfall forces discharge).



**R.55** Tank, pond or raceway discharge can be sealed off in an emergency to prevent untreated water spreading disease around and from the farm.

## 4.5 Feed and wastes

### Objective: Minimise the risk of feed and waste introducing and spreading disease

Live and fresh feeds (for example, fish, crustaceans and other aquatic invertebrates), either whole or in pieces, can pose a significant risk of disease transmission and spread. Commercial feeds pose a significantly lower risk as the heat extrusion process inactivates many pathogens of concern.

As mentioned under section 1.6, a number of reportable diseases of finfish, such as epizootic ulcerative syndrome (EUS) and red sea bream iridovirus (RSIV), have a wide host range and should be considered when using live or fresh fish as feed. Non-fish species, such as crustaceans, may have parasites, such as trematodes and nematodes, which can be transferred to the fish upon ingestion.

Freezing live and fresh feeds may kill some pathogens, but others such as viruses (for example, epizootic haematopoietic necrosis virus (EHNV)) are known to be resistant to freezing (Langdon 1989).

Wastes such as processing waste (for example, fish frames and viscera), liquids (for example, blood and washdown water) and effluent (for example, faeces, sludge, biofouling and filters) can also pose a risk of disease transmission and spread on farm.

Table 16 provides a summary of risk management measures for feed and waste. These measures are intended to cover the farming enterprise as a whole.

**Table 16. Risk management measures for feed and waste**

| Risk management measures                                                            |             |                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feed</b>                                                                         |             |                                                                                                                                                                                                                                                |
|    | <b>R.56</b> | Commercial, sanitised feeds (for example, heat extruded pellets) should be fed to fish whenever possible in preference to live or un-sanitised feeds.                                                                                          |
|    | <b>R.57</b> | Where untreated live, fresh or frozen raw feed must be used for broodstock, ensure feed is sourced from certified target-pathogen-free suppliers, or diagnostic screening is performed before feed entry onto the farm.                        |
|    | <b>R.58</b> | Feed and feeding regime details are recorded for tracking and tracing purposes. For example, the batch number, treatment date, manufacture date, country of origin, and pellet size.                                                           |
|    | <b>R.59</b> | Algae is sourced from a biosecure supplier, such as the Australian National Algae Supply Service, or a supplier of irradiated algae.                                                                                                           |
|   | <b>R.60</b> | Live feed cultures (algae, rotifers and <i>Artemia</i> spp.) are housed in a separate, biosecure room(s) with dedicated equipment. Aerosol and water transmission to other zones/areas of the farm, such as the hatchery, should be prevented. |
|  | <b>R.61</b> | Intake water for the live feed culture room(s) is filtered and treated prior to entry.                                                                                                                                                         |
| <b>Wastes</b>                                                                       |             |                                                                                                                                                                                                                                                |
|  | <b>R.62</b> | Dispose of other wastes such as water filters, biofouling, sludge and faeces (among others), appropriately and in accordance with local and state regulations, and permit requirements.                                                        |
|  | <b>R.63</b> | Dispose of solid and liquid processing wastes in an appropriate manner in accordance with local and state regulations, and permit requirements.                                                                                                |

## 5 SUPPORTING MEASURES

### 5.1 Emergency procedures and protocols

**Objective: To ensure emergency procedures and additional biosecurity measures are prepared in case of a suspected emergency animal disease (EAD) or a serious endemic disease (either on the farm or in an adjacent waterway).**

Emergency procedures and additional on-farm biosecurity measures may be documented in an emergency response plan (ERP). The ERP should provide clear guidelines on:

- **When** the plan should be activated, including,
  - the specific trigger points for an emergency animal disease (EAD) alert (for example, mortality rate, abnormal stock behavior)
- **Who** to contact, including,
  - the key list of emergency contacts
  - the notification pathways of the business (who to contact and when)
  - the notification pathways and responsibilities of the jurisdictional authority (who to contact and when)
  - the emergency animal disease hotline (1800 675 888)
- **What** to do once the plan has been activated, including,
  - the biosecurity risk management measures that need to be implemented (for example, complete shutdown of farm access, cessation of effluent release, restrictions to stock movement etc.)
  - the collection, storage and submission of samples for diagnostic testing
  - the decontamination, destruction and disposal of stock, water, wastes and equipment
- **Where** to find key pieces of information, including,
  - the quarantine protocols
  - the location of key response documents and resources (both soft and hard copies) (for example, AQUAVETPLANS, jurisdiction disease response plan(s), farm disease response plan(s)).

Ensure that your ERP is in line with Australia’s Aquatic Veterinary Emergency Plan, [AQUAVETPLAN](#) and other jurisdictional requirements.

Your farm emergency plan should also include the procedures to follow in the event of a non-disease emergency that may influence the farm’s biosecurity; for example, a power failure, water treatment failure or natural disaster. This will ensure the farm has clearly identified all responsibilities, notification pathways and other procedures before such an event.

**Table 17 Emergency plan risk management measures**

| Risk management measures                                                            |                                                                        |                                                 |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------|
|  | <b>R.64</b>                                                            | Ensure the farm has an emergency response plan. |
|  | Appendix 9. An example of an <b>emergency response plan template</b> . |                                                 |

5.2 Staff Training

**Objective: To ensure all farm staff understand the farm’s biosecurity plan and their responsibilities to maintain the farm’s biosecurity to prevent disease entry and spread.**

It is important that all farm staff:

- understand the farm biosecurity plan
- understand their responsibilities for its implementation
- are familiar with the work practices and SOPs that support the farm’s biosecurity plan
- are able to recognise the signs of ill health in stock
- are aware of the major routes of disease transmission onto, within and from the farm.

A training record can be used to document staff training requirements and participation, and to organize staff training inductions and refresher exercises.



Appendix 10. An example of a **training record template**.

Table 18 provides a summary of risk management measures related to staff training.

**Table 18 Staff training risk management measures**

| Risk management measures                                                            |             |                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>R.65</b> | At least one staff member takes on the role of biosecurity manager for the farm.<br><br>The biosecurity manager is responsible for creating, maintaining and reviewing the biosecurity plan and its associated documents and activities, including staff training.                                                                 |
|  | <b>R.66</b> | All staff must undergo a farm biosecurity induction and sign a “Pre-Employment Biosecurity Declaration”.                                                                                                                                                                                                                           |
|  | <b>R.67</b> | Staff have read and have ready access to the farm biosecurity plan and its associated documents.<br><br>Ensure that staff read and know the location of the SOPs for operating within the farm biosecurity plan.                                                                                                                   |
|  | <b>R.68</b> | Staff must participate in regular (annual) biosecurity refresher training. Including familiarisation with the farm’s: <ul style="list-style-type: none"><li>• biosecurity plan</li><li>• biosecurity zones</li><li>• emergency response plan</li><li>• standard operating procedures.</li></ul>                                    |
|  | <b>R.69</b> | Staff should receive regular (annual) training in disease identification, recording and reporting, including the investigation of suspected EAD events.<br><br>Staff must be aware of their roles and responsibilities in reporting signs of disease and high mortality.<br><br>A training record is maintained for each employee. |

5.3 Record keeping

**Objective: To record all information necessary to support good biosecurity practice in accordance with the farm biosecurity plan.**

Good record keeping is necessary for auditing farm biosecurity plans and to provide demonstrable proof that biosecurity protocols are being followed.

In the event of a disease outbreak, these records can be used to trace the potential origin of disease, possible extent of its spread within or beyond the farm, identify breakdowns in adherence to biosecurity protocols and consequently, help review and improve farming practices and protocols. Information on the health status of stock will assist in identifying potential emerging disease issues.

At a minimum, the following information should be recorded:

- all stock movements, including the origin of the animals and any movements onto, within and from the farm
- all stock management and husbandry activities, including stocking densities, feeding rates, growth rates, and grading and harvesting times
- the health status of the stock, including:
  - any changes in health status (for example, behaviour changes, morbidity and mortality)
  - the results of laboratory disease testing and health certification
  - the application of treatments or vaccines
- water quality observations and measurements
- staff and visitor information, including farm entry and exit times, and biosecurity training and inductions.

Table 19 provides a summary of risk management measures related to record keeping.

**Table 19 Record keeping risk management measures**

| Risk management measures                                                            |             |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>R.70</b> | All stock management activities, including all stock movements onto, within and from the farm and husbandry activities, such as feeding, grading, harvesting and vaccinating, are recorded in a readily accessible document(s). |
|  | <b>R.71</b> | A detailed record of stock health status, including mortality, disease testing and water quality, is maintained and kept in a readily accessible format that can be used for tracing and disease investigation purposes.        |

## 5.4 Legislative and jurisdictional regulatory requirements

**Objective: Ensure farm practices comply with jurisdictional legislation and license conditions.**

There are differences between state and territory legislation, and restrictions on operating aquaculture enterprises. Farm practices must comply with:

- relevant agency and jurisdictional legislation (including local, state/territory, and federal governments)
- license or permit conditions.

Table 20 provides a summary of risk management measures related to legislative and jurisdictional regulatory requirements. :

**Table 20 Regulatory requirement risk management measures**

| Risk management measures                                                            |                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>R.72</b> Adhere to applicable import requirements and obtain translocation permits for the movement of all stock and equipment. Maintain records as required.                                                                                        |
|    | <b>R.73</b> Only keep commercially farmed species on site in accordance with license conditions.                                                                                                                                                        |
|  | <b>R.74</b> Undertake batch testing or health surveillance requirements in compliance with jurisdictional regulations and/or accreditation programs.                                                                                                    |
|  | <b>R.75</b> All veterinary medicines used on fish must comply with relevant state and Commonwealth (Australian Pesticides and Veterinary Medicines Authority APVMA) legislation and have farm veterinarian oversight, and prescriptions where required. |

## 5.5 Biosecurity plan monitoring and auditing

**Objective: To demonstrate that the farm biosecurity plan is regularly maintained, reviewed (at least annually), updated as required and audited.**

Regular monitoring and auditing of your farm biosecurity plan will ensure that the plan is being maintained as a living document and is continually reviewed and updated based on:

- changes in biosecurity risks and threats
- ongoing experience and learnings
- infrastructure upgrades
- changes in farm practices
- newly available risk management tools or information
- auditing recommendations.

Risk management measures for consideration:



**R.76** Ensure the farm biosecurity plan is regularly reviewed (annually at a minimum).

## Document control

Document control information and an auditable revision record may be added to the farm biosecurity plan as a footer table. An example of this is provided in Table 21.



Include document control information and a revision record in the farm biosecurity plan.

**Table 21. Farm biosecurity plan footer for document control and revision information.**

| Document control |                                |                 |                                           |
|------------------|--------------------------------|-----------------|-------------------------------------------|
| Version          | <i>[for example, "2.0"]</i>    | Approved by     | <i>[Name, Position]</i>                   |
| Status           | <i>[for example, 'Draft']</i>  | Approved        | <i>[Date]</i>                             |
| Contact          | <i>[Name, Position, phone]</i> | Next review due | <i>[Date should not exceed 12 months]</i> |

## Auditing

The farm biosecurity plan should be audited at least annually through both internal and external processes, to ensure the plan being implemented effectively and is improved as appropriate.

All audits, including any deficits or recommendations made by the auditor and the farm's responses to these, should be recorded.

Risk management measures for consideration:



**R.77** The farm biosecurity plan is regularly audited (at least annually) to ensure it is being effectively implemented and improved as appropriate. All supporting documentation is identified and readily accessible.



Include a record of regular (at least annually) audits of the farm biosecurity plan.



## 6 SUPPORTING DOCUMENTS

**Objective: To provide a list of documents that support implementation of the farm biosecurity plan.**

The farm biosecurity plan should include a list of documents describing practices that support the implementation of the plan. These documents:

- may include SOPs, checklists and record-keeping templates
- should be readily accessible for review and audit.

Supporting documents do not need to be included in the body of the farm biosecurity plan but should be referred to within the plan (where appropriate). These documents may be kept elsewhere (and made readily available) or included as appendices.



Include a list of supporting documents that are referred to within the farm biosecurity plan. For example, SOPs, checklists and record keeping templates.



Appendix 4 includes a template for preparing a standard operating procedure (SOP).

### 6.1 Standard operating procedures

SOPs should be coded to facilitate their identification, review, and auditing. Coding may include the version number and the date of revision.

For example, your farm may have an SOP:

- for the farm biosecurity zones
- for new employee induction and training
- for farm visitors and contractors
- for stock arrivals, movements and dispatch
- for escapee prevention, inspection and collection
- for the management and assessment of stock health status
- for collecting and disposing of mortalities and other wastes
- for enacting the emergency response plan
- for disinfecting equipment and staff
- for conducting water quality testing

### 6.2 Checklists and templates

Checklists and templates are essential supporting documents that should be used in association with SOPs, wherever possible. Checklists provide essential evidence that an accountable staff member is following the procedures outlined in the SOP in the correct way and at the correct intervals.

Examples of record-keeping templates include:

- a pre-employment biosecurity declaration
- a visitor biosecurity declaration
- a visitor log
- the farm entry conditions for visitors
- the staff training record
- the mortality and water quality records.

Risk management measures for consideration:



**R.78** Supporting documents are clearly identified and within the farm biosecurity plan (for example, SOPs, checklists and templates). These supporting documents are kept readily available or are included as appendices to the plan.



Appendix 5. An example of a pre-employment biosecurity declaration.



Appendix 6. Visitor and contractor biosecurity declaration template.



Appendix 7. Visitor and contractor log template.



Appendix 8. Farm entry conditions for visitors and contractors.



Appendix 10. An example of a training record template.

**Each individual farm's biosecurity plan and its effectiveness will directly influence the ability of the farm to withstand an outbreak of a disease and minimise cost of control.**

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## APPENDIX 1. Self-audit checklist example

### Infrastructure and facility standards

| Page number       | Associated requirement | Audit questions                                                                                                                                                                                                                         | Audit response |    |     | Corrective action/ comments |
|-------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|                   |                        |                                                                                                                                                                                                                                         | Yes            | No | N/A |                             |
| 17                | R.1, R.2               | Does the farm have a secure perimeter or otherwise well-defined boundary? Can you close off access to prevent vehicle entry when required?                                                                                              |                |    |     |                             |
| 17                | R.2                    | Are farm access gates closed and locked when no staff are on-site (non-business hours)?                                                                                                                                                 |                |    |     |                             |
| 17<br>27–28       | R.3<br>R.31–33         | Do clear biosecurity zones exist on the farm? Do zone-specific procedures support this?                                                                                                                                                 |                |    |     |                             |
| 17                | R.4                    | Does the farm have clear signage denoting biosecurity zones at the entry and exit points, complete with specific disinfection requirements in relation to access, traffic direction, entry and exit procedures, clothing and equipment? |                |    |     |                             |
| 27, 32,<br>33     | R.31, R.64<br>R.67–69  | Are staff familiar with the farm’s biosecurity zones and associated requirements?                                                                                                                                                       |                |    |     |                             |
| 25<br>29–30<br>31 | R.9<br>R.40–55<br>R.61 | Does water intake, discharge and flow throughout the farm minimise disease entry and spread?                                                                                                                                            |                |    |     |                             |
| 25                | R.8                    | Are tanks, raceways and/or cages that have been cleaned, disinfected and dried before stocking                                                                                                                                          |                |    |     |                             |

| Page number | Associated requirement | Audit questions                                                                                                               | Audit response |    |     | Corrective action/ comments |
|-------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|             |                        |                                                                                                                               | Yes            | No | N/A |                             |
| 28–30       | R.39, R.46, R.50       | Are there records to demonstrate that water treatment/filtration infrastructure is appropriately maintained?                  |                |    |     |                             |
| 28          | R.38, R.39             | Are there records to demonstrate farm infrastructure and equipment of appropriately maintained and cleaned?                   |                |    |     |                             |
| 28          | R.34, R.36             | Does the farm have equipment that is dedicated to specific biosecurity zones and clearly labelled as such?                    |                |    |     |                             |
| 28          | R.33                   | Do you assess any equipment brought onto the farm for risk and appropriately treat it (clean and/or disinfect)?               |                |    |     |                             |
| 27          | R.28, R.29             | Does the farm have dedicated areas for visitor parking and delivery/loading?                                                  |                |    |     |                             |
| 24          | R.5                    | Does the farm have a dedicated fish delivery and loading area that is separate to production areas, which can be disinfected? |                |    |     |                             |

## Personnel standards

| Page number | Associated requirement | Audit questions                                                                                                                                                      | Audit response |    |     | Corrective action/ comments |
|-------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|             |                        |                                                                                                                                                                      | Yes            | No | N/A |                             |
| 26, 33      | R.23–27, R.66          | Does each employee sign a “Pre-Employment Biosecurity Declaration”?                                                                                                  |                |    |     |                             |
| 26          | R.24                   | Are hand sanitisation stations and footbaths (or separate boots) available, and used, at production area entrance/exit and where required between biosecurity zones? |                |    |     |                             |
| 27          | R.30, R.31             | Is there a visitors’ log that all visitors must complete on arrival?                                                                                                 |                |    |     |                             |
| 27          | R.30, R.31             | Do all visitors sign a visitor biosecurity declaration? Match this to the visitors’ log.                                                                             |                |    |     |                             |
| 27          | R.29–31                | Are farm entry conditions for visitors near the visitors’ log and prominently display?                                                                               |                |    |     |                             |
| 27          | R.28–32                | Are there appropriate (and documented) procedures in place to manage the risks posed by visitors and contractors to the farm?                                        |                |    |     |                             |
| 33          | R.65                   | Does the farm have a specified biosecurity manager?                                                                                                                  |                |    |     |                             |
| 33          | R.66–69                | Do staff understand the requirements and SOPs around the farm biosecurity zones after receiving their biosecurity induction?                                         |                |    |     |                             |
| 26          | R.23–27                | Are staff required to follow routine biosecurity risk management procedures                                                                                          |                |    |     |                             |

**Production practices**

| Page number                         | Associated requirement                                                     | Audit questions                                                                                                                                  | Audit response |    |     | Corrective action/ comments |
|-------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|                                     |                                                                            |                                                                                                                                                  | Yes            | No | N/A |                             |
| 24                                  | R.6                                                                        | Do you obtain health status information or certification and appropriate permits for new stock before entry to farm?                             |                |    |     |                             |
| 24                                  | R.7                                                                        | Are new stock quarantined in a biosecurity zone and their health monitored before being moved to other biosecurity zones on the farm?            |                |    |     |                             |
| 25                                  | R.10                                                                       | Are measures in place to prevent stock from escaping?                                                                                            |                |    |     |                             |
| 25<br>25<br>28<br>29–30<br>34<br>35 | R.11–15<br>R.17, R.19–22<br>R.35, R.39<br>R.47–49<br>R.70, R.71<br>R.72–75 | Are appropriate procedures in place to optimise stock health?                                                                                    |                |    |     |                             |
| 25<br>29<br>34<br>35                | R.13–R.19,<br>R.47, R.48<br>R.70, R.71<br>R.72–75                          | Are there records to demonstrate that stock health is regularly monitored, and any health problems are investigated?                             |                |    |     |                             |
| 25                                  | R.13, R.15–17                                                              | Does the farm have protocols for notifying relevant authorities of any significant, unexplained mortality event or suspected reportable disease? |                |    |     |                             |
| 25                                  | R.17, R.18                                                                 | Is there an appropriate procedure in place for recording and disposing of dead stock?                                                            |                |    |     |                             |
| 25                                  | R.19                                                                       | Is there equipment and contingency plans to manage high-mortality events                                                                         |                |    |     |                             |



| Page number                | Associated requirement                                 | Audit questions                                                                                                                                                       | Audit response |    |     | Corrective action/ comments |
|----------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|                            |                                                        |                                                                                                                                                                       | Yes            | No | N/A |                             |
| 26                         | R.20                                                   | Are different aquaculture fish species cultured in separate tanks, cages and ponds that do not share water?                                                           |                |    |     |                             |
| 26                         | R.21                                                   | Is access to the farm by wildlife, vermin or domestic animals prevented and controlled effectively?                                                                   |                |    |     |                             |
| 31                         | R.56                                                   | Do you only use manufactured or appropriately treated feeds?                                                                                                          |                |    |     |                             |
| 31                         | R.57–60                                                | When used, is live, free and frozen feeds are appropriately managed and treated to minimise disease risk?                                                             |                |    |     |                             |
| 26                         | R.58                                                   | Are your feeding records maintained and kept up to date?                                                                                                              |                |    |     |                             |
| 30<br>31<br>33<br>34<br>35 | R.50<br>R.62–63,<br>R.65–69,<br>R.70, R.71,<br>R.72–76 | Can you provide evidence that employees know and adhere to all applicable legislative and/or jurisdictional requirements? Provide evidence of required documentation. |                |    |     |                             |

## Documentation and training

| Page number | Associated requirement | Infrastructure and facility standards                                                                                                                                                               | Audit response |    |     | Corrective action/ comments |
|-------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|-----|-----------------------------|
|             |                        |                                                                                                                                                                                                     | Yes            | No | N/A |                             |
| 33          | R.68, R.69             | Are farm production staff appropriately trained in reporting disease and mortality?                                                                                                                 |                |    |     |                             |
| 32          | R.64                   | Does the farm have an emergency response plan?                                                                                                                                                      |                |    |     |                             |
| 32<br>33    | R.64<br>R.66–69        | Are all staff aware of the location, content and their role and responsibilities associated with the farm’s emergency response plan, biosecurity plan and associated documents (for example, SOPs)? |                |    |     |                             |
| 33          | R. 69                  | Is there a current training record for each employee?                                                                                                                                               |                |    |     |                             |
| 34          | R.70, R.71             | Is there a system in place to record stock inventory and movements and can you readily interrogate this for tracing purposes?                                                                       |                |    |     |                             |
| 35–36       | R.76, R77              | Is there evidence, through revision and audit records, that you critically review the biosecurity plan and improve on it as appropriate?                                                            |                |    |     |                             |
| 32<br>34–36 | R.64<br>R.70–77        | Can you readily identify and provide on request all supporting documents associated with the farm biosecurity plan?                                                                                 |                |    |     |                             |

## APPENDIX 2. Other resources for biosecurity planning

| Access via                                                        | What                                                                                                                                                                                                                                                                                                         | Where                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Farm Biosecurity website.                                         | Provides range of resources and templates for biosecurity planning.                                                                                                                                                                                                                                          | <a href="https://www.farmbiosecurity.com.au/">https://www.farmbiosecurity.com.au/</a>                                                                                                                                                                                                                                                                                                                          |
| Department of Agriculture, Fisheries and Forestry (DAFF) website. | AQUAVETPLAN is the Australian Aquatic Veterinary Emergency Plan. DAFF manages the development and maintenance of AQUAVETPLAN manuals, including disease manuals and operational manuals for: <ul style="list-style-type: none"> <li>- Decontamination</li> <li>- Destruction</li> <li>- Disposal</li> </ul>  | <a href="https://www.agriculture.gov.au/agriculture-land/animal/aquatic/aquavetplan">https://www.agriculture.gov.au/agriculture-land/animal/aquatic/aquavetplan</a>                                                                                                                                                                                                                                            |
| Department of Agriculture, Fisheries and Forestry (DAFF) website. | AQUAPLAN is Australia's national strategic plan for aquatic animal health. It outlines the strategic vision and guides investment to strengthen the national aquatic animal health system. It is developed collaboratively by aquatic animal industries and the Australian, state and territory governments. | <a href="https://www.agriculture.gov.au/agriculture-land/animal/aquatic/aquaplan">https://www.agriculture.gov.au/agriculture-land/animal/aquatic/aquaplan</a>                                                                                                                                                                                                                                                  |
| World Organisation for Animal Health (WOAH, formerly the OIE).    | Aquatic animal health code.<br>Manual of Diagnostic Tests for Aquatic Animals.                                                                                                                                                                                                                               | <a href="https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-code-online-access/">https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-code-online-access/</a><br><a href="https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-manual-online-access/">https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-manual-online-access/</a> |
| Australian Pesticides and Veterinary Medicines Authority (APVMA). | Lists information on drugs and chemicals registered for use in aquaculture in Australia.                                                                                                                                                                                                                     | <a href="http://www.apvma.gov.au/">http://www.apvma.gov.au/</a>                                                                                                                                                                                                                                                                                                                                                |
| Water Quality website.                                            | Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Water quality guidelines for the protection of cultured fish, molluscs and crustaceans.                                                                                                                                           | <a href="https://www.waterquality.gov.au/guidelines/anz-fresh-marine">https://www.waterquality.gov.au/guidelines/anz-fresh-marine</a>                                                                                                                                                                                                                                                                          |
| Disease Watch website.                                            | Latest information on training and awareness resources for aquatic animal disease emergencies.                                                                                                                                                                                                               | <a href="http://www.disease-watch.com">http://www.disease-watch.com</a>                                                                                                                                                                                                                                                                                                                                        |

| Access via                               | What                                                                                                                                                                                                                                                                                                                                                                                                                 | Where                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State and territory governments websites | <p>Victorian Fisheries Authority, Victoria.</p> <p>Department of Agriculture and Fisheries, Queensland.</p> <p>Department of Primary Industries, NSW.</p> <p>Department of Primary Industries and Regional Development, WA.</p> <p>Department of Primary Industries and Regions (PIRSA), South Australia.</p> <p>Department of Natural Resources and Environment Tasmania.</p> <p>Northern territory Government.</p> | <p><a href="https://vfa.vic.gov.au/">https://vfa.vic.gov.au/</a></p> <p><a href="https://www.daf.qld.gov.au/business-priorities/fisheries">https://www.daf.qld.gov.au/business-priorities/fisheries</a></p> <p><a href="http://www.dpi.nsw.gov.au/fisheries">http://www.dpi.nsw.gov.au/fisheries</a></p> <p><a href="http://www.fish.wa.gov.au/Pages/Home.aspx">http://www.fish.wa.gov.au/Pages/Home.aspx</a></p> <p><a href="https://www.pir.sa.gov.au/">https://www.pir.sa.gov.au/</a></p> <p><a href="https://nre.tas.gov.au/">https://nre.tas.gov.au/</a></p> <p><a href="https://nt.gov.au/marine">https://nt.gov.au/marine</a></p> |

Note: hyperlinks provided in the table above were correct as of October 2022.

## APPENDIX 3. Biosecurity sign

Corflute signs are available for purchase at <https://www.farmbiosecurity.com.au/toolkit/>



## APPENDIX 4. How to write a simple Standard Operating Procedure (SOP)

Standard operating procedures (SOPs) aim to provide simple clear informative step-by-step instructions and checklists to carry out a task/tasks consistently and routinely while minimising misunderstanding and errors.

SOPs are developed using information sourced from a combination of existing literature, anecdotal information and/or *in situ* learnings. SOPs typically change over time as a result of continuous improvement and the emergence of new information and technologies from commercial and scientific sources.

The purpose of a SOP may be for biosecurity reasons but may also be for other reasons such as work, health and safety or environmental protection requirements.

Key considerations when writing a SOP

- Ensure the SOP is short and concise, but still containing all the necessary information to perform the procedure. Consider breaking longer SOPs into multiple shorter SOPs.
- Where appropriate, use tables, lists, flow diagrams, photos, icons and/or other graphics rather than large blocks of text.
- Write in plain English that staff will understand.
- Ensure steps in the procedure follow a logical thought process and are clear (avoid vague statements).
- Ensure SOPs are numbered to complete the procedure.

Components of a SOP

**Title:** Should be clear and unambiguous. For example: Cleaning and Disinfecting Nets.

**SOP number:** Consider assigning a brief reference code or number that can be referred to in the farm biosecurity plan and other documents. For example: SOP-123-V1.0.

**Purpose:** The purpose is the reason for having this procedure, what is the aim? For example: This procedure aims to ensure you nets are properly cleaning and disinfected to minimise the risk of spreading disease on the farm.

**Definitions:** If required, include definitions of any technical terms or acronyms that may not be understood by staff.

**Precautions:** Clearly describe any activities that must be avoided while undertaking the procedure, for example: For example, equipment and animals must not leave the affected area.

**Occupational health and safety.** Consider hazards to the health, safety and wellbeing of staff. For example, follow manufacturer's guidelines for storing and using chemicals described in the procedure.

**Welfare risks.** Consider the risk to stock. For example, Maintain and monitor dissolved oxygen concentration when treating fish with formalin.

**Staff responsibilities:** List staff member(s) and what they are required to do.

For example:

| Staff member(s) | Responsibility                                                                                                                |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| All             | Understand and follow this procedure. Report any breach of this procedure to your supervisor or the farm manager immediately. |
| Farm manager    | Ensure all staff follow this SOP.<br>Maintain and update this SOP.                                                            |

*Procedure details:* List the activities and tasks that make up this procedure, as well as any checklists staff members need to use. These can be numbered in a logical order. For example:

1. Cease all activity including feeding, cleaning or stock movement.
2. Check water quality parameters such as flow, DO, temperature.
3. Secure the area to prevent access by unnecessary personnel, and to prevent movement of equipment, or stock.
4. Assess the extent of the situation. How many tanks are affected? What is the proportion of sick or dead animals? Are there any obvious disease signs?

*Training and supervision:* Describe what training and supervision is required for staff to undertake the procedure. For example: Staff required to have completed biosecurity training.

*Further information:* Include supporting information, related documents and SOPs, and cross-references to the relevant sections of the farm biosecurity plan.

*Document control:* Include document control information to ensure the SOP remains relevant and appropriately updated and auditable.

## Example SOP template

|                                  |                                                                  |                                 |                              |
|----------------------------------|------------------------------------------------------------------|---------------------------------|------------------------------|
| <b>[Insert title]</b>            |                                                                  | <b>SOP No.: [insert number]</b> |                              |
| <b>Purpose</b>                   |                                                                  |                                 |                              |
| <i>[Insert text]</i>             |                                                                  |                                 |                              |
| <b>Definitions</b>               |                                                                  |                                 |                              |
| <i>[Insert text]</i>             |                                                                  |                                 |                              |
| <b>Precautions</b>               |                                                                  |                                 |                              |
| Activities to avoid:             | <i>[Insert text as required]</i>                                 |                                 |                              |
| Occupation health & safety:      | <i>[Insert text as required]</i>                                 |                                 |                              |
| Animal welfare:                  | <i>[Insert text as required]</i>                                 |                                 |                              |
| <b>Staff responsibilities</b>    |                                                                  |                                 |                              |
| Staff member(s)                  | <i>[Insert text as required]</i>                                 |                                 |                              |
| All                              | <i>[Insert text as required]</i>                                 |                                 |                              |
| Farm manager                     | <i>[Insert text as required]</i>                                 |                                 |                              |
| <i>[Insert text as required]</i> | <i>[Insert text as required]</i>                                 |                                 |                              |
| <b>Procedure details</b>         |                                                                  |                                 |                              |
| Step                             | Task description and notes                                       |                                 |                              |
| 1                                | <i>[Insert text as required]</i>                                 |                                 |                              |
| 2                                | <i>[Insert text as required]</i>                                 |                                 |                              |
| 3                                | <i>[Insert text as required]</i>                                 |                                 |                              |
| 4                                | <i>[Insert text as required]</i>                                 |                                 |                              |
| <b>Training and supervision</b>  |                                                                  |                                 |                              |
| <i>[Insert text as required]</i> |                                                                  |                                 |                              |
| <b>Further information</b>       |                                                                  |                                 |                              |
| <i>[Insert text as required]</i> |                                                                  |                                 |                              |
| <b>Document control</b>          |                                                                  |                                 |                              |
| Version                          | for example, 1.0                                                 | Status                          | for example, Approved, Draft |
| Approved by                      | Name: <i>[insert name]</i><br>Position: <i>[insert position]</i> | Date approved:                  | <i>[insert date]</i>         |
| Writer/ Owner                    | Name: <i>[insert name]</i><br>Position: <i>[insert position]</i> | Review Due Date:                | <i>[insert date]</i>         |



## APPENDIX 5. Pre-employment biosecurity declaration template

I, ..... hereby agree to abide by  
**MY EMPLOYER'S BIOSECURITY** rules and standards.

I **understand** the following applies at all times:

**I must:**

1. attend work in clean, laundered clothes
2. only enter those areas of the farm I am approved to access
3. follow a one-directional flow of work (from low-risk to high-risk zones) if required to enter more than one zone during daily work
4. immediately report any biosecurity breaches to management
5. immediately report any suspicion of disease to management.

**I must not:**

1. visit other aquaculture sites or seafood processors for 24 hours before entering the farm unless I have had a full head-to-toe shower and changed into clean, laundered clothes and shoes
2. wear or take boots outside their designated production area
3. move any zone-specific equipment to any other zone.

Signature ..... Date .....

## APPENDIX 6. Visitor and contractor biosecurity declaration template

### Biosecurity Declaration

To be completed by all visitors and contractors prior to entering.....

1. Are you entering production areas of the farm?

Yes ☐ (go to question 2)

No ☐ (go to signature section)

2. Have you been in contact with any aquaculture enterprise or the aquatic environment in the previous 24 hours (including recreational fishing, seafood processors and water sports/activities)?

Yes ☐ (go to question 3)

No ☐ (go to question 4)

3. Have you had a head-to-toe shower and changed into clean clothes and shoes?

Yes ☐ (go to question 4)

No ☐ (postpone no-essential visit, or manager to assess risk before granting access)

4. Are you bringing any equipment, fish feed, dive gear or fishing gear onto the farm?

Yes ☐ (go to question 5)

No ☐ (go to signature section)

5. Have equipment and other items been sanitised to eliminate fish pathogens?

Yes ☐ (go to signature section)

No ☐ (stop equipment entry onto farm, or manager to assess risk before granting access)

I ..... agree to abide by the **entry conditions for visitors**.

Signature ..... Date .....

## APPENDIX 7. Visitor and contractor log template

### Visitor and contractor log

To be completed by all visitors and contractors upon entry and exit.

| Date | Name | Company | Contact number | Visitor biosecurity declaration completed | Time in | Time out |
|------|------|---------|----------------|-------------------------------------------|---------|----------|
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |
|      |      |         |                |                                           |         |          |

## APPENDIX 8. Farm entry conditions for visitors and contractors

Entry to this farm is subject to the following conditions:



If entering production areas, visitors must **not have been in contact with any other aquaculture, seafood processors or the aquatic environment** on the same day (or within the previous 24 hours), unless they have had a full head-to-toe shower and have changed into clean clothes and sanitised footwear.



Visitors must **complete a visitor biosecurity declaration**.



Visitors must **complete the visitor's log**.



Visitors must **wear boots** provided.



Visitors must **clean/sanitise hands** before entering production areas.

## APPENDIX 9. Emergency response plan template

An emergency response plan aims to minimise the impact of emergency biosecurity incidents. The plan template, below, outlines employee actions and responsibilities to be undertaken in the event that an emergency fish disease is suspected in the farm.

### A. Define the trigger to execute the emergency response plan.

Farm Licence conditions commonly use terminology such as ‘unusually high, unexplained mortality’ to define triggers for an emergency response. Triggers need to be defined for the individual farm areas, as triggers may differ according to fish size. Triggers may include increased daily mortality rate (above a specific level), abnormal stock behaviour, and/or certain clinical signs such as red spots on the body surface.

### B. Important contacts

Include contacts appropriate to your farm. The table below contains some examples.

| Title                                          | Name                 | Contact details             |
|------------------------------------------------|----------------------|-----------------------------|
| Company/general manager                        | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| Farm manager                                   | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| Farm biosecurity manager                       | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| Farm veterinarian                              | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| State government aquatic animal health officer | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| State government laboratory                    | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |
| Emergency Animal Disease Watch Hotline         | <i>[insert name]</i> | Phone: 1800 675 888         |
| Industry contact                               | <i>[insert name]</i> | Mobile:<br>Phone:<br>Email: |

### C. Notifications and responsibilities

When this plan is triggered, employees must immediately implement the following practices. Note that all staff should have capacity to elevate their concerns about a major disease outbreak

| Action                                                                                                            | Person responsible | Signature | Complete/<br>date     |
|-------------------------------------------------------------------------------------------------------------------|--------------------|-----------|-----------------------|
| 1. Contact farm manager                                                                                           | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 2. Contact farm biosecurity manager                                                                               | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 3. Contact farm veterinarian                                                                                      | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 4. Contact relevant government authority                                                                          | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 5. Document and follow all instructions as the relevant authority directs                                         | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 6. Contact neighbouring farms, or farms which have received stock from the farm suspected to be affected          | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 7. Stop all movement of live fish from the farm until disease status known and the relevant authority approves it | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 8. Isolate any suspected or known diseased stock from other stock on farm.                                        | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 9. Stop all movements of stock within the farm.                                                                   | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 10. Stop water movement out of affected tank/ pond/ raceway                                                       | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 11. If extreme risk identified, stop water movement out of the farm                                               | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 12. Collect, package and submit samples for pathology as the relevant authority directs                           | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 13. Stop all non-essential visitor and contractor movements onto the farm                                         | Name:<br>Position: |           | Y / N<br>__ / __ / __ |

| Action                                                                                                                  | Person responsible | Signature | Complete/<br>date     |
|-------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|-----------------------|
| 14. Advise farm staff not to move any equipment from the area suspected of disease to other farm areas, or off the farm | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 15. Restrict all non-essential staff movements into the area suspected of diseases                                      | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 16. Ensure you make all staff aware of the actions being taken and their individual responsibilities.                   | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 17. Advise all customers/processors immediately affected.                                                               | Name:<br>Position: |           | Y / N<br>__ / __ / __ |
| 18. Compile a list of movements over the preceding two weeks – including stock, personnel, equipment and machinery.     | Name:<br>Position: |           | Y / N<br>__ / __ / __ |

#### D. Sample collection, packaging and dispatch

Collect, package and submit samples for pathology as the relevant authority directs.

Document which staff members have been trained in sample collection and packaging.

##### **Sample collection**

Follow these guidelines when submitting fresh samples:

- Contact the farm veterinarian and relevant laboratory to discuss sample collection (what samples to collect and how) and notify them of proposed shipment
- Collect and submit samples of live stock that are typically sick (preferably moribund). Do not sample animals that are already dead unless specifically requested to do so.
- When live samples cannot be readily transported to the laboratory, collect and submit
  - Freshly killed sick fish sent on ice immediately to the laboratory (do not freeze samples) (fish that have been dead for as little as 24 hours are unlikely to yield a diagnosis)
  - Samples preserved in 10% neutral buffered formalin (do not freeze the formalin-preserved samples) or the fresh samples sent in individual plastic bags on ice.
  - Collect and freeze separate samples if requested to do so
- Submit both sick and healthy stock separately, in separate, labelled containers (do not mix 'healthy' specimens with sick specimens).

##### **Sample labelling**

- Ensure that all submitted samples are separately labelled (unlabeled samples are unacceptable)
- Labels must:

- be legible
  - remain attached to sample containers (cannot fall off)
  - do not fade and cannot be smeared, washed off, or rubbed off.
- Labels should include:
  - Farm descriptor (for example, name or license number and address)
  - Contact details
  - Date
  - A description relating the samples such as contents of the consignment (species, numbers, and method of preservation), history of the disease event (when, where, which stock were affected) and previous case number (if previous submissions have been sent to the laboratory)

### ***Packaging samples***

- Carefully pack samples to avoid breakage, leakage or contamination (multiple layers of sealed packaging must be used)
- Place samples in non-breakable, leak-proof containers (do not use glass jars)
- Pack samples in appropriate transport containers (for example, a disposable poly box or foam esky) together with enough paper or other absorbent material to soak up any leakage.

### ***Sample submission***

- Submit samples as soon as possible following collection.
- Notify (by phone) the laboratory that a shipment of samples is being sent and provide courier details, if possible, to allow tracking information
- Submission details:
  - Name of state or territory laboratory
  - Address that samples are being submitted too
  - Contact number of laboratory liaison or case manager
  - Name and contact number of the transport courier. Transport may be arranged directly through the relevant authority or laboratory (ensure these arrangements are clear in this plan).

## **E. Stock destruction, disposal and quarantine protocols**

Insert stock destruction and disposal protocol information.

For example: In the event that this emergency response plan is triggered, dead stock are rapidly collected into double-lined fish bins (or equivalent), transported to the approved onsite burial site and immediately covered over. Do not return dead stock to the environment. Do not let scavengers have access to dead stock.

The AQUAVETPLAN has manuals that provide guidelines for destruction of stock in a disease event, and disposal methods ([www.agriculture.gov.au/animal/aquatic/aquavetplan](http://www.agriculture.gov.au/animal/aquatic/aquavetplan))

Disposal options need to be considered in this plan that account for the volume of stock (based on farm size) for which disposal may be required. See *AQUAVETPLAN – Operational procedures manual – Disposal* (<https://www.agriculture.gov.au/animal/aquatic/aquavetplan/disposal>) for further information.



Insert details of quarantine protocols, including isolation and disinfection, or reference a farm-specific quarantine SOP.

#### **F. Key response plans**

Insert the details of any other response plans or documents for other freshwater finfish diseases if applicable.

If viral encephalopathy and retinopathy (nodavirus) is identified, the farm will refer to:

- the requirements of *AQUAVETPLAN – Disease Strategy Manual – Viral encephalopathy and retinopathy* (available at <https://www.agriculture.gov.au/animal/aquatic/aquavetplan/viral-encephalopathy-retinopathy>) (include the electronic and/or physical location on site)
- any specific state or territory emergency response documents (insert their electronic and/or physical location on site)
- directions from the relevant authority.

## APPENDIX 10. Training record template

**Training Record**

Employee name: \_\_\_\_\_ Position: \_\_\_\_\_

Minimum training requirements:

- Farm biosecurity plan: \_\_\_\_\_
- Emergency response plan: \_\_\_\_\_
- Job-specific SOPs: \_\_\_\_\_
- Other: \_\_\_\_\_

| Date | Subject/topic/document | Trainer | I understand the training delivered and have read and understand the associated document(s)<br>(signature of employee) | Due date of refresher training |
|------|------------------------|---------|------------------------------------------------------------------------------------------------------------------------|--------------------------------|
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