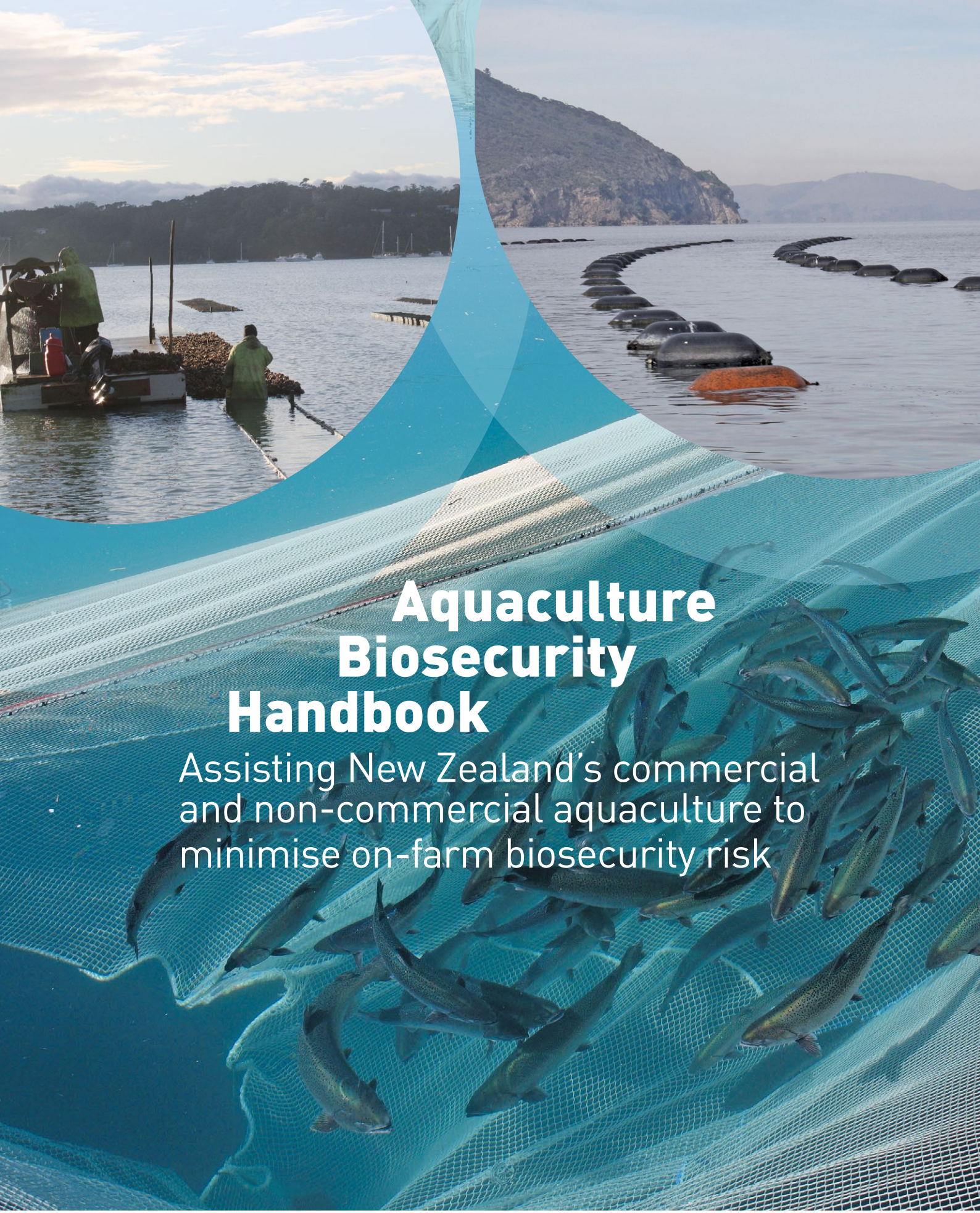

Aquaculture Biosecurity Handbook

Assisting New Zealand's commercial and non-commercial aquaculture to minimise on-farm biosecurity risk

Aquaculture New Zealand

Ministry for Primary Industries
Manatū Ahu Matua

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Contents

THIS HANDBOOK 2

BIOSECURITY: AN OVERVIEW 3

QUICK GUIDE: PROTECT YOUR FARM IN SEVEN STEPS 4

HOW PESTS AND DISEASES CAN BE INTRODUCED AND SPREAD 6

PLAN AND BE PREPARED – FARM BIOSECURITY PLANS 7

BIOSECURITY MANAGEMENT OBJECTIVES AND RECOMMENDED PRACTICES 7

STOCK HEALTH AND PATHWAY MANAGEMENT 8

1 STOCK HEALTH MANAGEMENT 9

2 STOCK MOVEMENTS AND CONTAINMENT 10

3 WATER 11

4 EQUIPMENT, VEHICLES AND VESSELS 13

5 PEOPLE MANAGEMENT 14

6 FEEDS AND FEEDING 16

7 WILDLIFE, SCAVENGERS AND VERMIN 16

GENERAL MANAGEMENT & QUALITY ASSURANCE 17

8 RECORD KEEPING 18

9 MONITORING/SURVEILLANCE 19

10 WASTE (OTHER THAN WATER) 20

11 AUDITING 20

12 CONTINGENCY PLANS 21

IMPORTANT INFORMATION 22

BIOSECURITY PLAN TEMPLATE 23

THIS HANDBOOK

This handbook provides guidance to strengthen your on-farm biosecurity management to protect your business, industry and stock. These practices can help you minimise unnecessary costs and production losses, and reduce the risk of losing market access. By following good on-farm biosecurity practices you will be better placed to cope with a potential pest or disease outbreak.

An industry that is better informed will:

- avoid problems rather than try and solve them
- make informed decisions
- minimise the impacts by being prepared if something does arise
- maintain and improve your role as a responsible user of the aquatic environment.

Preventive biosecurity is more cost effective than reactively trying to solve a problem once it has occurred. The best way to start is to understand the risks associated with your farm and industry, and to undertake good biosecurity practices to manage and minimise them where practical.

Who does this handbook apply to?

This handbook is suitable for all commercial and non-commercial aquaculture including, farmers, research facilities and hobbyists. The information in this handbook will help you develop biosecurity management plans. Developing a biosecurity management plan will help you to assess and prioritise the biosecurity risks relevant to your operation. These plans will be as individual as your farm. Plans will vary depending on the type, location, design and size of your farm, and the species and life stages farmed. A biosecurity plan template is provided at the end of this handbook. We recommend that you seek professional biosecurity advice to help assess the risks associated with your farming operations and in the development and implementation of your biosecurity plan.

Information within this handbook represents:

- guidance to inform your on-farm biosecurity management plans
- a set of practical and cost effective options to prevent and reduce pest and disease impacts to your farm
- science-based information developed in consultation with farmers and industry bodies.

To support this handbook other material has been produced, including:

- **a technical reference document** – containing detailed information about preventive on-farm biosecurity[1]
- **a pest and disease identification guide** – to help you identify pests and diseases of concern.

This information can be accessed via the MPI and Aquaculture NZ websites **www.mpi.govt.nz** and **www.aquaculture.org.nz**

This handbook is not:

A prescriptive set of rules – however, you must be aware of and follow any laws that are in place. These laws are there to protect your industry, the interests of other water users, and the aquatic environment. Should you have any questions about these laws please contact MPI on **fishfarm@mpi.govt.nz**

1 The technical reference document ***Options to Strengthen On-Farm Biosecurity Management for Commercial and Non-Commercial Aquaculture*** covers salmon, trout, oysters, mussels and paua. However, much of the information contained in the document will be relevant to other species. Further reference documents will be produced for other New Zealand aquaculture species.

BIOSECURITY: AN OVERVIEW

Biosecurity is the exclusion, eradication or effective management of risks posed by pests and diseases to the economy, environment and human health. Biosecurity is not just about stopping pests and diseases at our borders. Biosecurity also includes protecting your business, industry and environment from the introduction, exacerbation or spread of pests and diseases. Everyone working in, managing, or owning a farm has a responsibility to undertake good biosecurity practice.

MPI's pre-border, border and post-border measures exclude disease entry into New Zealand and maintains freedom from most pests and diseases that are found in many aquatic animal stocks around the world. However, due to our dependence on ocean borne transport for trade, natural water and wild animal movements, our aquatic environment remains susceptible to the introduction of non-indigenous organisms.

Biosecurity is a top priority for government. In 2018, the implementation of a standard for biofouling on arriving vessels will strengthen our border controls. Further work is underway to strengthen our internal borders across all sectors (for example, commercial shipping, fisheries, oil and gas exploration and recreational boating) to prevent the spread of species that may impact the aquaculture industry. This work also includes working with councils on national direction for biosecurity.

Where implemented correctly, good biosecurity practice will reduce the risk of pest and disease introduction or exacerbation on your farm, minimise the spread within your farm or to new areas, promote animal health, and protect economic investment and human health.

Preventive biosecurity is especially relevant for farms in close proximity to each other. Ideally farmers should address biosecurity collaboratively by taking into account water movements or catchment zones. Management options for most aquatic pests and diseases are still limited, hence prevention remains the best line of approach for aquaculture.

> Biosecurity is the exclusion, eradication or effective management of risks posed by pests and diseases to the economy, environment and human health.

Early detection and reporting are key as they can improve the chance of successfully managing pests and diseases and reduce their impacts and spread. Unwanted and notifiable organisms, as defined in the Biosecurity Act 1993, must be reported immediately to **MPI's pest and disease hotline 0800 80 99 66**.

Following good on-farm biosecurity practices will:

- minimise the introduction, exacerbation and spread of pests and diseases onto, within and from farms
- increase the ability to manage pests and diseases should outbreaks occur
- reduce the costs of pests and diseases to your productivity and ongoing management
- maintain and improve your market access and the social licence of your industry.

QUICK GUIDE

Everyone involved in commercial and non-commercial aquaculture has an important role in protecting their farm, their industry, and the aquatic environment from biosecurity risk.

This handbook provides guidance on how you can minimise the risk of introduction, exacerbation and spread of pests and diseases within and from your farm. Incorporating the following steps into your daily farm operations will assist you to protect your business, your industry, and the aquatic environment on which we all depend. The cost of implementing good preventive biosecurity practices are lower than the costs of managing pests and diseases once they occur.

PROTECT YOUR FARM IN **SEVEN STEPS**

1.Maintain stock health and welfare

Follow good animal husbandry practices. The benefits of good animal welfare and biosecurity go hand-in-hand and should minimise animal stress where practicable.

2.Be aware of the pathways of risk organisms onto, within and off your farm

Make sure your staff are familiar with the pests and diseases of concern and their pathways. Carry out biosecurity induction and ongoing training to explain required behaviours and hygiene practices on your farm.

3.Obtain pest and disease-free stock

Preferentially source stock from areas/facilities with a known health status and with a health monitoring programme. Keep records of all stock movements onto, within and off your farm so they can be traced in the event of a problem.

4. Keep things clean

Carry out good cleaning and disinfection practices to help prevent the introduction, exacerbation and spread of pests and diseases. All people (including workers and visitors), equipment, vehicles and vessels represent potential ways of spreading pests or diseases onto, within or off your farm. Make sure they have been cleaned and disinfected before entering and leaving your farm. Other pathways that may spread pests and diseases include feed and wildlife.

5.Check your farm

Constant vigilance is vital for early detection of pests and diseases. Regularly monitor your stock for signs of unusual behaviour, colourations, pests or mortalities. Knowing what is normal will help you to recognise what isn't. Keep records (written, photographic) of all unusual observations.

6.Report anything unusual

Farmers are regularly in and around the aquatic environment and therefore are well placed to notice anything out of the ordinary. If your stock appears abnormal or experiences unusual sickness or mortalities you should ensure these are investigated promptly, either through referral to your aquatic health professional and/or by calling **MPI's pest and disease hotline 0800 80 99 66**. You should also ring the hotline if you see or suspect an unwanted or notifiable organism. Information about why you should ring the **0800 number** and what happens when you do can be found on the MPI website **www.mpi.govt.nz**.

7.Have a biosecurity management plan in place

A biosecurity management plan will help you to assess and prioritise the biosecurity risks relevant to your farming operation. Implementing good biosecurity practices will in turn help you prevent, reduce or manage those risks.

HOW PESTS AND DISEASES CAN BE INTRODUCED AND SPREAD

When thinking about farm biosecurity, you should identify farm inputs, throughputs and outputs – "the pathways". For example, the following pathways should be considered when producing a biosecurity management plan and when locating and designing a new farm:

Stock movements and containment

» Introduction of new stock or broodstock onto your farm
» Stock movements within your farm
» Stock movements off your farm
» Stock escapes.

Water

» Water that can be controlled - pumped or flowed onto, within and off your farm
» Uncontrolled water – farms that reside in water e.g. at sea, in lakes or canals
» Water that stock is transported in.

Equipment

» Nets, ropes, baskets, buoys, containers, clothing, footwear, etc
» Vessels – barges, supply boats
» Vehicles – transporting trucks, trailers, courier vans.

People

» Site staff
» Staff from other farms
» Visitors, contractors, couriers, suppliers.

Feed

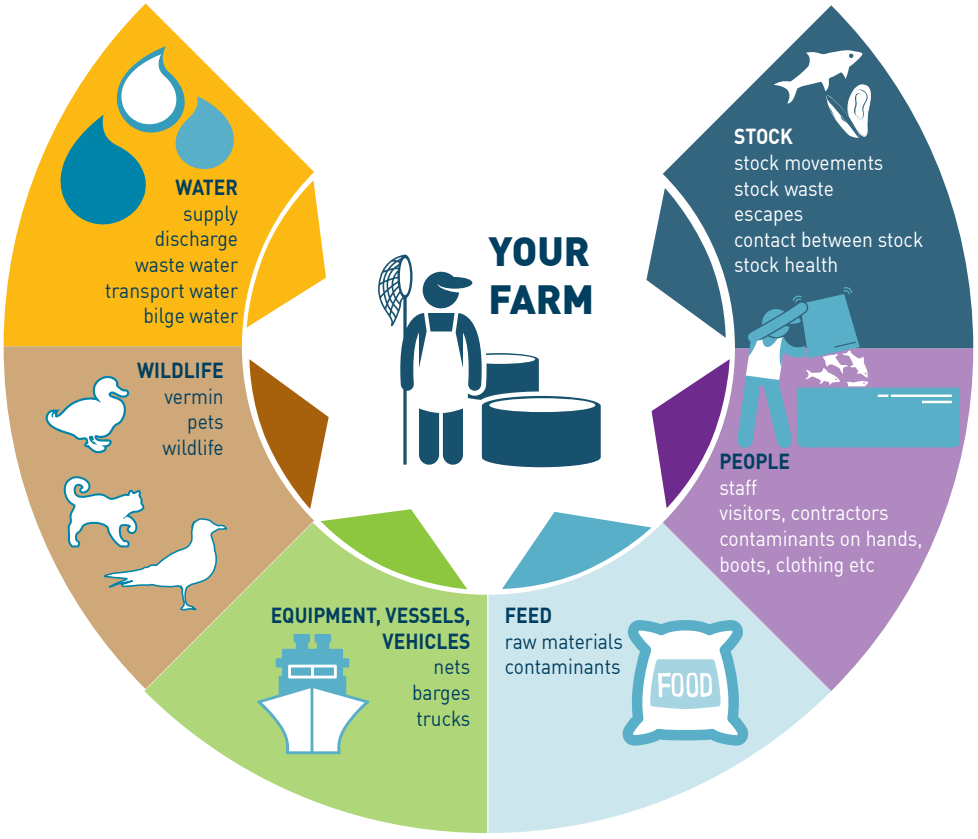
» Stock feed
» Raw materials.

Wildlife

» Marine mammals, birds
» Vermin (rats, mice, stray or feral animals)
» Domestic animals.

Farm location and design are also important aspects to consider.

Main risk pathways for pests and diseases to spread on to, within and from a farm



PLAN AND BE PREPARED – FARM BIOSECURITY PLANS

Biosecurity practices should be practical and fit-for-purpose. The biosecurity practices you implement should be simple and as low cost as possible whilst achieving the desired outcomes. However, some changes may take time and require substantial long term costs. These will vary depending on the level of risk and methods to mitigate and manage the risk. Biosecurity plans are a form of insurance and need financial and intellectual investment, and commitment to implement. Good biosecurity practices can improve the performance of your farm.

The information in this handbook represents a starting point to strengthen your on-farm biosecurity. Developing and implementing a biosecurity management plan using the plan template and technical reference document is the next step. A biosecurity plan template is provided at the rear of this handbook. For a range of options to prevent and manage pest and disease introduction, exacerbation and spread please refer to the **technical reference document**. Some measures can be implemented on-site, whilst others may require co-operative implementation with neighbouring farms.

Implementing good biosecurity practices into day-to-day activities and operations is the best way to minimise biosecurity risk to your farm. There are many quick, simple and practical measures that can help protect your farm and your industry's future.

Good practices should not be overly complicated, costly, or difficult to follow and implement.

When developing a plan it is important to consider all aspects of your production system (farm purpose, type, location and design) and the species and life stages reared.

The following biosecurity objectives and recommended practices will assist you with your biosecurity management plans.

BIOSECURITY MANAGEMENT OBJECTIVES AND RECOMMENDED PRACTICES

Plan and record how you are going to achieve the intent of the following objectives where applicable to your farm operation.

STOCK HEALTH AND PATHWAY MANAGEMENT

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1. STOCK HEALTH MANAGEMENT*

Objective: Stock health should be maintained to optimum levels.

Recommended practices:

» Keep stock stress to a minimum.

» Maintain optimum water quality levels.

» Maintain appropriate stocking densities.

» Provide appropriate diets and nutrition.

» Avoid unnecessary or rough handling of stock.

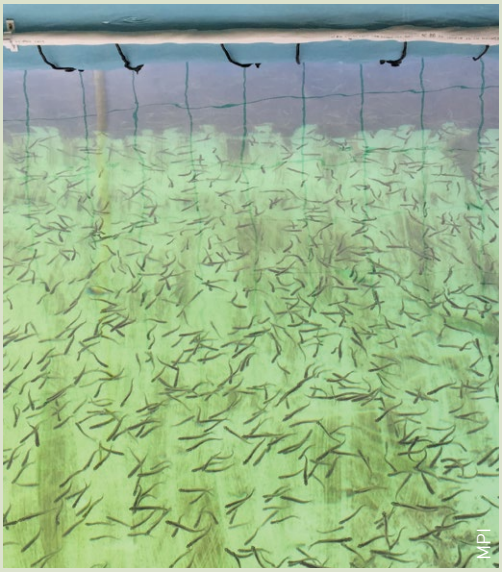
» Keep transfers within or between farms to a minimum.

» Monitor stock frequently.

» Remove dead or dying stock from remaining stock as soon as practicable:
  - A veterinarian or aquatic health professional should be contacted as soon as possible to conduct testing.
  - Store dead animals for testing in a biosecure manner.
  - Dispose of sick (moribund) or dead animals in a biosecure manner (i.e. that is not accessible to other stocks, wildlife, vermin, or pose a hazard to the environment or human health).
  - Increase inspection frequency during periods of higher risk, such as elevated water temperatures or known problems elsewhere.
  - Keep accurate records of all instances of pest occurrence, suspicion of disease and deaths and any treatments administered.

» Monitor and keep records of all aspects of stock health management (e.g. water quality parameters, stocking densities, handling events, growth and feed conversion ratios).


Graeme Silver


MPI

Ian Hadland, NZ Fish and Game Council

* the health of stock must also take into account animal welfare.

2. STOCK MOVEMENTS AND CONTAINMENT

Objective: Minimise the pest and disease risk associated with stock movements onto, within and off your farm.

Recommended practices:

» Only stock of known health status should be introduced onto your farm. Health status should be equal or better than stock already present.

» Only move stock off your farm to locations of equal or lesser health status than the current location.

» If stock of unknown health status is to be introduced (e.g. wild broodstock, seed stock), this stock should be isolated in separate production units or dedicated quarantine facilities (e.g. land-based farms)

» Where it is considered by your biosecurity adviser that unacceptable risk exists, broodstock should be indefinitely quarantined with the aim of producing progeny that would replace that broodstock (e.g. high-health or specific pathogen-free progeny), or euthanise broodstock and dispose in a biosecure manner

» Within-farm stock movements to areas of equal or higher health status should occur following a documented consideration of pest and disease risks

» Precautions should be undertaken to prevent the within farm spread of pests, disease until such situations are resolved

» Monitor and treat (as required) new stock

» Keep accurate records of all stock movements onto, within or off your farm

» Prevent stock escapes.

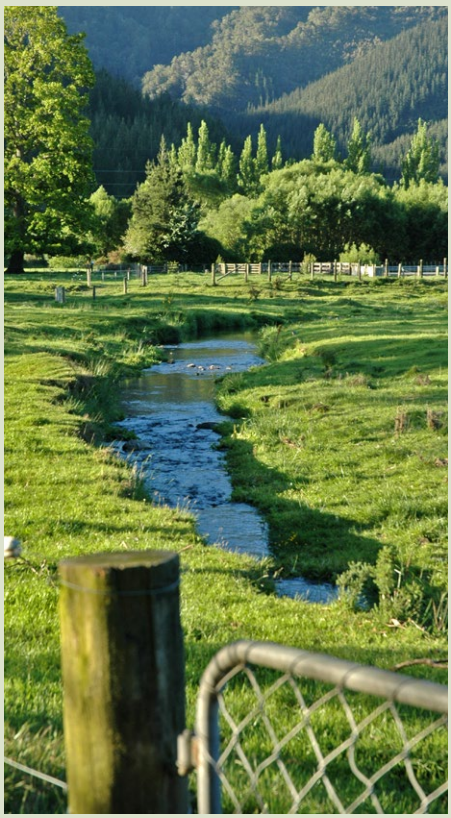
3. WATER

3.1. Water sources (land-based farms)

Objective: Minimise the risks of pests and disease entry and spread associated with incoming water.

Recommended practices:

- The water supply should be assessed for biosecurity risk and appropriate action(s) taken
- Locate water intake and outflow pipes to avoid cross-contamination
- Treat intake water to an acceptable level so as to minimise the risk of pests and diseases entering your farm (screening, filtration, ultra-violet light, ozone)
- Regularly monitor and maintain infrastructure that treats incoming water
- Water flow within land-based farms should minimise the potential for spread of pests and diseases to different production units
- Install screens on intake pipes to prevent entry of undesirable organisms (e.g. wildlife)
- Monitor and keep records of all water treatments, including maintenance of screens
- Have contingency plans in the event of water treatment failures and in the event of a pest or disease outbreak
- Maintain good water quality at all times
- Design pipework, raceways, ponds, tanks etc, so they can be easily cleaned without discharge of untreated effluent into the environment.



3.2. Waste water management (land-based farms)

Objective: Minimise the pest and disease risks associated with discharging water from your farm.

Recommended practices:

» Treat discharge water to an acceptable level to minimise the risk of any pests or diseases establishing in the surrounding environment (e.g. screening, filtration, UV, ozone)

» Screens should be installed on discharge pipes to avoid stock escapes and reduce the risk of pests and diseases leaving your farm

» Treat or dispose of all water used in the transport of stock in a biosecure manner (i.e. that does not pose a hazard to the environment or neighbouring farms).

3.3. Water sources (open system farms)

Objective: Minimise the pest and disease risks that may enter your farm from the water your farm is located in.

It is difficult to minimise the risk of pests and diseases entering or leaving your farm when the water source is not able to be controlled (e.g. at sea, in lakes and canals). Therefore, greater emphasis should be placed on those pathways that can be managed (e.g. stock movements, people, equipment), working with neighbouring farms (e.g. area based management) and the ongoing monitoring and surveillance.

Recommended practice:

» Open system farms should consider zoning or compartments to separate populations (epidemiological separation) and disease risk between farms (e.g. fallowing, year class separation).

4. EQUIPMENT, VEHICLES AND VESSELS

Objective: Minimise the risk of equipment, vehicles and vessels introducing and spreading pests and diseases onto, within and off your farm.

Recommended practices:

» Assess all equipment, vehicles and vessels entering the farm for biosecurity risk and ensure that risk is managed by taking appropriate action(s)

» Standard operating procedures and dedicated infrastructure should be in place for cleaning and disinfection of equipment, vehicles and vessels

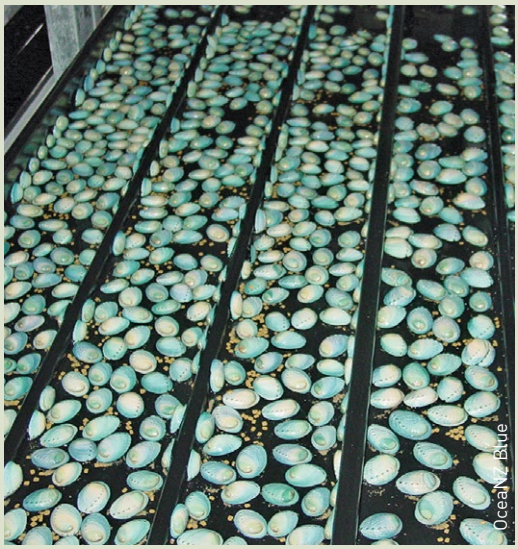
» Farms should have dedicated and well-designed delivery and loading areas

» Dispose of any biofouling in a biosecure manner

» Where possible, avoid sharing equipment, vehicles and vessels between farms or designated locations within a farm. Where equipment, vehicles or vessels travel between farms, appropriate cleaning and disinfection should be carried out and documented

» Keep records of all instances of cleaning and disinfection of structures, equipment, vehicles and vessels

» Do not encourage non-operational vessels to visit marine farms.



5. PEOPLE MANAGEMENT

5.1. Staff and visitors

Objective: Minimise the risk of staff and visitors transferring pests and diseases onto, within and off your farm.

Recommended practices:

» Assess all staff and visitor access to farms for biosecurity risk and ensure that risk is managed by taking appropriate action(s). Refusal of entry should be considered for high risk visitors

» Manage farm access (e.g. access controls and signage)

» All visitors should be briefed regarding on-farm biosecurity

» Preventive measures for pest and disease entry and spread should apply to all farm staff and visitors (e.g. dedicated changing areas, ante rooms, separate production areas, footbaths and hand washing facilities)

» Restrict staff and visitor access to sensitive areas (e.g. broodstock, hatcheries, and quarantine areas)

» Ensure any decontamination areas (e.g. changing areas, ante rooms, footbaths and hand washing facilities) are away from production areas

» Keep records of all visitors to your farm

» Keep records of education and staff training.

5.2. Property (farm design, access and signage)

Objective: Minimise the biosecurity risks associated with visitors or unwanted persons accessing unauthorised areas of your farm.

Recommended practices:

» Farm location and design should take into account access, stock biosecurity, and the health and welfare of the species farmed

» The farm should have a clearly established biosecurity zone (e.g. secure perimeter fencing or otherwise well-defined boundary)

» Close and lock farm entrances to prevent unauthorised entry. Lock entrances during all non-visitor hours

» Assess farm inputs (e.g. water, stock, staff, equipment, feed) for potential biosecurity risks and take appropriate action(s) to address identified risk(s).

5.3. Staff training and education

Objective: Ensure all staff and visitors are appropriately trained to understand their biosecurity responsibilities.

Recommended practices:

» The farm should have a nominated staff member responsible for oversight of on-site biosecurity

» All staff should understand the farm biosecurity plan and their responsibilities for its implementation

» Training should be provided to staff on the aspects of the biosecurity plan (including identified pest and disease risks)

» Staff responsible for managing stock are aware of the importance of preventive measures, early detection, and reporting of unusual, sick or dead animals through the farms health professional and/or by calling **MPI's pest and disease hotline (0800 80 99 66)**.

» Staff know how to respond and what to do in the event of a suspected pest or disease outbreak.

6. FEEDS AND FEEDING

Objective: Minimise the risk of feed exacerbating or transferring pests and diseases onto, within and off your farm.

Recommended practices:

» All feeds entering the farm should be assessed for biosecurity risk and appropriate action(s) taken to address identified risk(s)

» Source feeds from reputable suppliers to ensure they provide assurances of quality and content

» Ensure any feed containing aquatic organisms is adequately treated to ensure safe product

» Store feeds in designated areas (e.g. clean and dry) to avoid contamination and reduced feed quality

» Regularly inspect feed to check for the presence of mould, vermin, and other undesirable organisms.

Both photos MPI

7. WILDLIFE, SCAVENGERS AND VERMIN

Objective: Minimise the risk of wildlife, scavengers, vermin, and pets transferring pests and disease onto, within or from the farm.

Recommended practices:

» Control or exclude predators, wildlife, vermin and other organisms (e.g. aquatic life) from land-based systems

» Control, exclude or prevent aggregations of predators, wildlife, vermin and other organisms (e.g. aquatic life) from open water systems

» Regularly inspect farms for biosecurity breaches or signs of potential breaches and remedy as required

» Keep records of any presence of wildlife and vermin, or biosecurity breaches and any preventive or corrective actions taken.

GENERAL MANAGEMENT & QUALITY ASSURANCE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Plant & Food Research

8. RECORD KEEPING

Objective: Record all information necessary to trace and determine the origin of pest or disease in the event of an outbreak.

Recommended practices:

» Maintain records to trace stock, and their associated health status, onto, within or from the farm

» Maintain records for all aspects of the biosecurity plan (e.g. staff training, inspection and maintenance of farm infrastructure and equipment, visitor logs)

» Other records* that should be maintained include, but are not limited to:

- all stock transfer on to, within, and off your farm
- stock health
- purchases and sales
- monitoring and surveillance activities
- testing and declarations
- stocking densities
- stock performance
- feed schedules
- environmental parameters e.g. water and air temperature, water quality, pH, rainfall, dissolved oxygen levels
- stock disease and mortalities
- treatments and vaccinations administered
- cleaning and disinfection procedures
- breaches in containment
- security breaches (intruders and thefts).

*All recordkeeping must comply with any relevant legislation.

9. MONITORING/SURVEILLANCE

Objective: Minimise the biosecurity risk to a farm by implementing appropriate monitoring and surveillance practices.

Recommended practices:

- Regularly inspect and monitor all of your stock and record abnormalities and mortalities (including early signs of stress, behavioural changes or presence of pests)
- Investigate suspected health problems in your stock
- Observe and record abnormalities and mortalities in wild stocks around your farm
- Maintain access to qualified veterinarian or aquatic health professional who can provide advice and examine stock at short notice
- Undertake disease status checks and testing at least twice a year or as determined by a risk assessment conducted by your veterinarian or aquatic health professional
- Monitor and record mortalities over time to identify trends to determine normal and abnormal farm mortality rates
- Set up standard operating procedures for your staff to notify the responsible manager and/or authorities in the event of abnormalities and mortalities
- If you or your staff see anything unusual please call **MPI's pest and disease hotline: 0800 80 99 66**.

All photos MPI

10. WASTE (OTHER THAN WATER)

Objective: Minimise the pest and disease risks associated with removal and disposal of farm waste.

Recommended practices:

» All waste should be assessed for biosecurity risk to the farm and environment and appropriate action(s) taken to address identified risks

» Containment, handling and disposal of waste should be conducted in a biosecure manner

» Designate waste holding areas that are biosecure (i.e. away from production or feed storage areas)

» Contain, handle and dispose of waste in a biosecure manner

» Disposal of waste should be to an approved waste site or waste management company and must comply with local and central government requirements.

11. AUDITING

Objective: To ensure your farm biosecurity plan continues to address biosecurity risks effectively and efficiently.

Recommended practices:

» Have audits conducted of on-farm biosecurity plans and their implementation at regular prescribed intervals

» Farms should have a veterinary health plan (VHP), which includes a biosecurity plan that sets out biosecurity protocols, preventive measures, treatments and contingencies. The VHP should be updated as required

» Your farm biosecurity plan should include a schedule for routine review and identify any triggers for extraordinary review.

12. CONTINGENCY PLANS

Objective: To ensure contingency plans are developed and understood to minimise the impact of emergency incidents that relate directly or indirectly to farm biosecurity.

Recommended practices:

» The farm biosecurity plan should include contingencies for direct (e.g. outbreak) and indirect incidences (e.g. storms, earthquakes) that may influence on-farm biosecurity

» All farm staff should be aware of the contingency plans and understand what to do in the event of an incident

Incidences that require biosecurity considerations include but are not limited to:

» Natural disasters (eg storm damage, flooding, fire, earthquake, tsunami)

» Chemical/oil spill

» Water supply (e.g. availability)

» Pest incursion

» Water quality

» Contaminated effluent water

» Mass mortalities

» Emergency culling

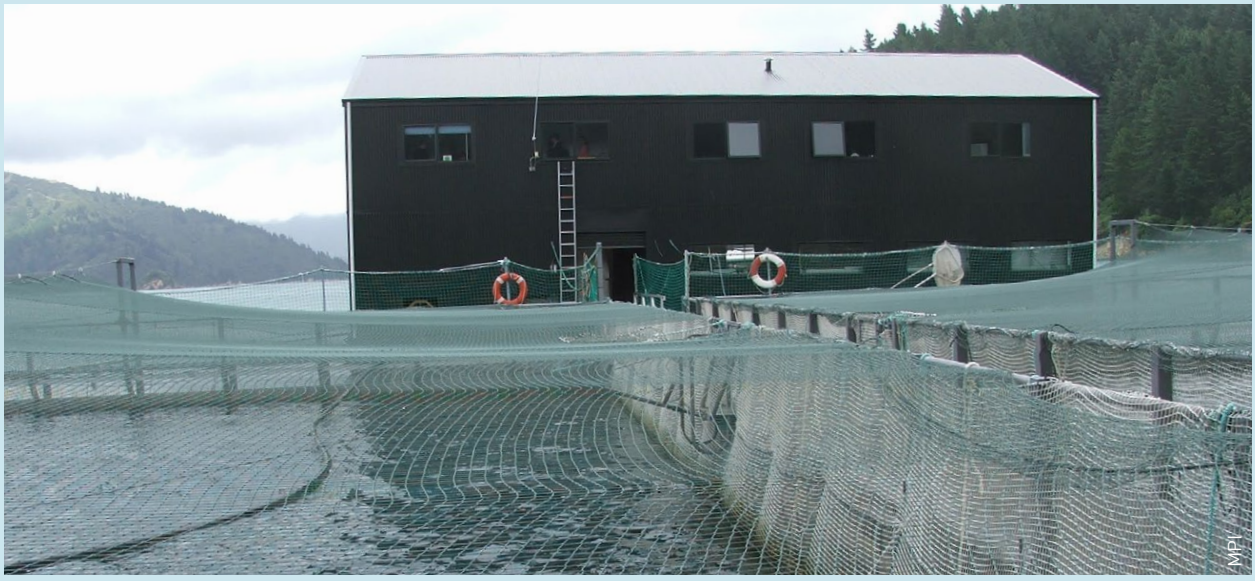
» Emergency cleaning and disinfection

» Mass escape

» Harmful algal bloom

» Jellyfish swarm

» Licensed use of veterinary medicines, therapeutic agents.



IMPORTANT INFORMATION

Additional documents

» Technical Reference Document: ***Options to Strengthen On-Farm Biosecurity Management for Commercial and Non-Commercial Aquaculture***

» Biosecurity Plan Template (also included at the end of this handbook)

» ***New Zealand Marine Pest Identification Guide***.

Further information

To support this handbook and the development and implementation of biosecurity management plans farmers are encouraged to refer to the **technical reference document** and a biosecurity plan template (following pages).

This and other aquaculture biosecurity information is available on the MPI and Aquaculture NZ websites: **www.mpi.govt.nz** and **www.aquaculture.org.nz** and refer to your veterinarian or aquatic health professional.

Legislation

The following provides an example of the laws that may relate to commercial and non-commercial aquaculture. The laws that apply to your farming operations will depend upon the species farmed, your operation, and use of species being farmed.

» Fisheries Act 1996

» Freshwater Fish Farming Regulations 1983

» Biosecurity Act 1993

» Animal Products Act 1999

» Animal Welfare Act 1999

» Conservation Act 1987

» Resource Management Act 1991

If you have any questions about aquaculture related laws please contact MPI on **fishfarm@mpi.govt.nz**

Border management

Information on vessels arriving to New Zealand: **http://www.mpi.govt.nz/importing/border-clearance/vessels/**

Import Heath Standards – requirements for importing animals and animal products into New Zealand: **http://www.mpi.govt.nz/law-and-policy/requirements/import-health-standards/**

BIOSECURITY PLAN TEMPLATE

Fish & Game New Zealand

BIOSECURITY PLAN TEMPLATE

This biosecurity plan template is provided to help you develop and implement good biosecurity practice on your farm. Delete sections that are not applicable.

Using a plan and good biosecurity practices in your daily farming activities and operations will help reduce the biosecurity risk to your farm, your business, your sector, and the environment. When developing your plan remember to consider all aspects of your production system and neighbouring systems. Delete sections that are not applicable for your situation.

The development and implementation of your biosecurity plan should be undertaken in conjunction with farm management and staff. Keep the plan simple but fit for purpose. Consider the cost of implementing versus the cost of not. Some changes may be carried out immediately while others will take time, incur financial cost and alter how your farm and staff operate, for example, keeping new records, changing infrastructure, introducing new procedures, or using new equipment. This will depend on the level of risk and the mitigation option chosen.

We encourage you to refer to the technical reference document (insert link) for more details and options to prevent and manage pest and diseases on your farm.

Guidelines	**Example management policy**	**How** (e.g. responsibility, reference materials, SOPs. This can be adapted as appropriate)
Stock health management		
Stock health should be maintained to optimum levels.	A veterinary health management plan is developed and implemented	Develop a fish/shellfish health management plan with your veterinarian and/or aquatic health/ biosecurity professional.
Stock movements and containment		
Only stock of known health status should be introduced onto the farm. Health status should be equal or better than stock already present.	Stock will only be accepted from a facility/farm/site with biosecurity and health management plans, where pest and disease surveillance is carried out (or following batch certification) and where no unexplained mortalities have occurred in the last 6 months.	
If stock of unknown health status is to be introduced (e.g. wild broodstock, seed stock), these stock should be isolated in separate production units or dedicated quarantine facilities while their health status is evaluated (e.g. diagnostic testing).	Uncertified or unknown status stock will be held in a specialised quarantine facility, with full separation of water, personnel, equipment, feed, etc. until the status of the stock can be ascertained by e.g. inspection and diagnostic testing.	
Where it is considered by your biosecurity advisers that an unacceptable risk still exists, broodstock should be indefinitely quarantined with the aim of producing progeny that would replace that broodstock (e.g. high-health or specific pathogen free progeny).	Where stock status cannot be determined to be acceptable, stock will be held permanently in quarantine, with progeny actively tested out of the quarantine.	
Within-farm stock movements to areas of equal or higher health status should only occur following a documented consideration of pest and disease risks.	Stock will not be moved within farms from areas of higher risk to areas of lower risk, except where absolutely essential and only after a written risk assessment and mitigation process has been carried out and management is satisfied the risks can be successfully mitigated.	

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Precautions should be undertaken to prevent the within farm spread of pests, or disease until such situations are resolved.	Outbreaks of pest and/or disease on the farm will result in an immediate movement standstill onto, within or off the farm.	
Prevent stock escapes.	Holding units on the farm will be appropriately designed and maintained to minimise the potential for escapes.	
Water		
The water supply should be assessed for biosecurity risk and appropriate action(s) taken.	Intake water will be screened to prevent entry of feral animals and will be filtered and sterilised for supply to sensitive life stages.	
Locate water intake and outflow pipes for land-based farms to avoid cross-contamination.	Effluent pipes will be located so that discharge water does not directly enter intake pipes.	
Regularly monitor and maintain infrastructure that treats incoming water.	A maintenance programme will be established and followed for water treatment equipment.	
Water flow within the farm should minimise the potential for spread of pests and diseases to different production units.		
Open system farms should consider epidemiological separation of populations (e.g. fallowing, year class separation).		
Equipment, vehicles and vessels		
Assess all equipment, vehicles and vessels entering the farm for biosecurity risk and appropriate action(s) taken.		
Standard operating procedures and dedicated infrastructure should be in place for cleaning and disinfection of equipment, vehicles and vessels.		
The farms should have dedicated delivery and loading areas.		
People management		
Assess all staff and visitor access to farms for biosecurity risk and appropriate action(s) taken.		
Manage farm access (e.g. access controls and signage).		
All visitors should be briefed regarding on-farm biosecurity.		
Preventive measures for pest and disease entry and spread should apply to all farm staff and visitors (e.g. dedicated changing areas, ante rooms, separate production areas, footbaths and hand washing facilities).		

Guidelines	Example management policy	How (e.g. responsibility, reference materials, SOPs. This can be adapted as appropriate)
Restrict staff and visitor access to sensitive areas (e.g. broodstock, hatcheries, quarantine areas).		
Property management		
The farm should have a clearly established biosecurity zone (e.g. secure perimeter fencing or otherwise well-defined boundary).		
Close and lock farm entrances to prevent unauthorised entry. Lock entrances during all non-visitor hours.		
Staff training and education		
The farm should have a nominated staff member responsible for oversight of on-site biosecurity.		
All staff should understand the farm biosecurity plan and their responsibilities for its implementation.		
Training should be provided to staff on the aspects of the biosecurity plan (including identified pest and disease risks) relevant to their position description.		
Feed and feeding		
Assess all feeds entering the farm for biosecurity risk and appropriate action(s) taken.		
Wildlife, scavengers and vermin		
Control or exclude predators, wildlife, vermin and other organisms (e.g. aquatic life) from land-based systems.		
Control, exclude or prevent aggregations of predators, wildlife, vermin and other organisms (e.g. aquatic life) from open water systems.		
Record keeping		
Maintain records to trace stock, and their associated health status, onto, within or from the farm.		
Maintain records for all aspects of the biosecurity plan (e.g. staff training, inspection and maintenance of farm infrastructure and equipment, visitor logs).		
Waste management		
All waste should be assessed for biosecurity risk to the farm and environment and appropriate action(s) taken.		

Guidelines	**Example management policy**	**How** (e.g. responsibility, reference materials, SOPs. This can be adapted as appropriate)
Containment, handling and disposal of waste should be conducted in a biosecure manner.		
Auditing		
Conduct audits of on-farm biosecurity plans and their implementation at regular prescribed intervals.		
Contingency plans		
The farm biosecurity plan should include contingencies for direct (e.g. outbreak) and indirect incidences (e.g. storms, earthquakes) that may influence on-farm biosecurity.		
All farm staff should be aware of the contingency plans and understand what to do in the event of an incident.		