

Biosecurity – Aquatic fieldwork hygiene

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Scope:

Under the *Biosecurity Act 2015* (the Act) biosecurity is a shared responsibility between government, industry, and communities. This procedure is a State Priority for NSW and should be read in conjunction with the Aquatic Biosecurity – Pests and Diseases policy. The procedure applies to NSW DPI and LLS in their role as authorised officers under the Act. The Aquatic Fieldwork Hygiene procedure also applies to everyone engaged by NSW DPI and LLS, contractors, permit holders and research collaborators that conduct aquatic fieldwork for NSW DPI. It also applies to anyone who operates under a permit or authority issued by NSW DPI with this procedure listed as a condition of that permit or authority, to work in NSW waterways.

For the purpose of this procedure, NSW waterways includes:

- the interface between NSW waterways and terrestrial environment, marine, estuarine, and freshwater environments, and wetlands, whether privately or publicly owned/managed
- aquaculture facilities, including ornamental facilities and private aquaria.

This procedure applies to all aspects of aquatic fieldwork undertaken by NSW DPI and LLS staff, and other parties as described above. It includes planning, implementation and return to base at the end of an aquatic fieldwork activity as well as predeparture checks and additional cleaning and decontamination measures or separate gear as needed prior to the next visit to NSW waterways. This document outlines procedures that have been developed for above mentioned individuals to implement this standard of aquatic hygiene that minimises the biosecurity risks associated with aquatic fieldwork activities. As new knowledge comes to light, these procedures will be reviewed accordingly.

Please note that a section 37 or other permit under the *Fisheries Management Act 1994* does not authorise activities in breach of the *Biosecurity Act 2015* and in some cases permits under both acts will be required. For information on biosecurity permits email aquatic.biosecurity@dpi.nsw.gov.au.

Management of the biosecurity risk

This procedure has been developed as a detailed guideline to ensure an appropriate level of aquatic fieldwork hygiene for all staff of NSW Department of Primary Industries (NSW DPI), and Local Land Services (LLS), as well as contractors, permit holders and research collaborators that conduct

aquatic fieldwork for NSW DPI and LLS. It also applies to anyone operating under a permit or other authority issued by NSW DPI that lists this procedure as a condition of that permit/authority.

Any person who conducts work within the NSW aquatic environment creates a risk of introducing and/or spreading aquatic pests and diseases between different aquatic locations in NSW and has a responsibility to manage that risk. Aquatic fieldwork can unknowingly spread aquatic pests or diseases from one area to another. Once an introduced aquatic pest or disease is established in an area, it is very difficult to eradicate.

Biosecurity legislation summary

Prohibited matter

Duty to notify suspicions immediately to an authorised officer, call 1800 675 888

A number of aquatic pests and diseases are listed as prohibited matter under Schedule 2 of the Act. This means that a person who owns or is in charge of aquatic animals or marine vegetation, or a person working with aquatic animals or marine vegetation in their professional capacity, has a duty to immediately notify an authorised officer if they suspect, or are aware of prohibited matter aquatic pests and diseases. Aquatic pests and diseases listed as prohibited matter are generally not already known to be present in NSW and often exotic to Australia as well and have the potential to have very high impacts on the industry, environment and/or community of NSW if they were allowed to establish in NSW waterways.

Notifiable matter

Duty to notify suspicions to an authorised officer as soon as possible and within one business day, call 1800 675 888 or email aquatic.biosecurity@dpi.nsw.gov.au

A number of other aquatic pests and diseases are notifiable under Schedule 1 of the Biosecurity Regulation 2017 (the Regulation). This means that a person who owns or is in charge of aquatic animals or marine vegetation, or a person working with aquatic animals or marine vegetation in their professional capacity, has a duty to notify an authorised officer within one working day if they suspect, or are aware of notifiable aquatic pests and diseases. This requirement does not apply where the pest has already been confirmed for that waterway and location, or in the case of a disease confirmed in that waterway in that year and season. If in any doubt, report.

Examples of who the 'duty to notify' prohibited and notifiable matter applies to include:

- people who own aquatic animals or marine vegetation, such as hobbyists in the case of ornamental fish, and
- people who own or are in charge of commercial facilities that house aquatic animals or marine vegetation, and
- recreational and commercial fishers who have caught fish that they know or suspect to be diseased, and
- veterinarians and other professionals consulted about aquatic animals or marine vegetation
- recreational divers and other people who know or suspect the presence of an aquatic pest or disease.
- anyone else who ought reasonably to know/suspect an aquatic pest or disease is present based on their involvement in the industry/area

Report your suspicions of prohibited matter (immediately) and notifiable matter (as soon as possible and within one business day) to an authorised officer via the 24-hour Emergency Animal Disease Hotline on 1800 675 888. Suspected notifiable matter may also be reported via the email aquatic.biosecurity@dpi.nsw.gov.au. If in doubt, take clear photographs of the suspected pest or disease and the GPS coordinates of your location and report it immediately.

Dealings with prohibited or notifiable matter – certain dealings prohibited

Under section 28 of the Act, it is an offence for people to deal with prohibited matter. In the context of aquatic pests and diseases, this means that it is an offence for people to do anything that is described in section 12 of the Act as dealing with which includes moving, selling or experimenting on, among other things, aquatic pest animals or marine vegetation declared as prohibited matter, and anything carrying prohibited matter aquatic diseases, unless the person could not have reasonably known that they were dealing with aquatic pests or diseases. Note that the Secretary (or delegate) can issue a prohibited matter permit that authorises specific dealings with prohibited matter, such as aquatic pests or diseases, subject to specific conditions. Certain dealings are also prohibited for notifiable matter under clause 18 of the Regulation.

Emergency aquatic pest and disease outbreaks:

In the case of an outbreak of an emergency aquatic pest or disease, the Secretary (or delegate) may issue an emergency order under section 44 of the Act. This would declare a biosecurity emergency and establish measures to respond to that biosecurity emergency.

Control orders can also be put in place under section 62 of the Act. These, along with General Biosecurity Directions and Individual Biosecurity Directions are other tools that can be used to prevent, eliminate, minimise, or manage a biosecurity risk or biosecurity impact.

General Biosecurity Duty:

In addition to legislation relating to specific aquatic pests and diseases, everyone also has a General Biosecurity Duty under Part 3 of the Biosecurity Act 2015 to be aware of their surroundings and take action to prevent the introduction and spread of pests, diseases, weeds, and contaminants.

Information

The collection, use and disclosure of information in accordance with this procedure, including any internal or external discussion or distribution of information, must be in compliance with the *Privacy and Personal Information Protection Act 1998* or be exempted by the operation of section 387 of the Act.

Section 387 (2) of the Act provides authority for the disclosure of information about a person, without the consent of the person: to a public sector agency, or to any other person, but only if the disclosure is reasonably necessary for the purpose of exercising a biosecurity risk function.

Work health and safety

The *Work Health and Safety Act 2011* places an obligation on the agency (NSW DPI and LLS) as an entity and workers as people conducting business or an undertaking, to provide a safe and healthy workplace. Safe Work Method Statements that support activities included in this procedure must be used in identifying, assessing, and controlling risks.

NSW DPI and LLS work together to create a safe and supportive work environment when undertaking any activities for this procedure. Other people to which this procedure applies are likewise bound by any work health and safety legislation as it applies to their respective organisation.

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Aquatic fieldwork hygiene procedure

1. Roles and responsibilities

1.1 NSW Department of Primary Industries and Local Land Services

NSW DPI and LLS will:

- ensure that the biosecurity risk of fieldwork activities is minimised through implementation of this procedure when undertaking research or compliance or other operational activities
- provide information to stakeholders that this procedure exists and is being implemented to provide assurance that NSW DPI and LLS activities do not contribute to biosecurity risk when moving gear and equipment between waterways.

1.2 Contractors, and people operating under a permit

Contractors and people operating under a permit with this procedure listed as a condition will:

- ensure that the biosecurity risk of fieldwork and other activities is minimised through implementation of this procedure when undertaking research or other activities outlined in their permit
- maintain records and provide information to NSW DPI when required, to demonstrate the measures undertaken so that their activities do not contribute to biosecurity risk in NSW waterways

Note: The provisions of the *Biosecurity Act 2015* apply to everyone, regardless of whether it is specifically mentioned in a person's work contract, or any permit issued by the department.

2. Fieldwork planning

Aquatic fieldwork planning is to include identification of the activities that may allow for the introduction and/or spread of a pest or disease and ensuring that the appropriate hygiene procedure measures are implemented. This is to minimise the risk of those activities introducing or spreading a pest or disease including an awareness of known pest and disease risks for each waterway and any specialised cleaning and decontamination or other risk mitigation measures relevant to these.

When visiting multiple waterways (fieldwork locations), plan fieldwork according to the level of biosecurity risk. That is, schedule unknown risk or lowest risk waterways first, followed by those of known risk. If possible, known risk waterways should be scheduled as a separate event, especially if extra biosecurity risk mitigation measures are required, for example when working with oyster equipment including vessels in waterways known for previous outbreaks of Pacific Oyster Mortality Syndrome (POMS) or QX disease, both of which have specific legislated requirements under the Clause 99 and Clause 98 respectively of the [Biosecurity Order \(Permitted Activities\) 2019](#), see www.legislation.nsw.gov.au

The aquatic fieldwork plan should include:

- a list of activities to enable identification of appropriate procedures for implementation of each activity to reduce its risk of spreading a pest or disease
- current status of aquatic pests and/or diseases in the fieldwork locations being visited (i.e., known, or unknown and where known, what pests or diseases are involved). See section 3 and Appendix 2 of this procedure and www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases for further information and for questions call the NSW DPI Aquatic Biosecurity team on 02 4916 3900
- practical considerations with regard to feasibility (availability of water, time, daylight)

- assessment of conditions at each site that may impact type of cleaning required (i.e., if raining and muddy, on-site cleaning would be required)
- a checklist of equipment required to enable appropriate cleaning and/or disinfecting of fieldwork equipment before leaving each fieldwork location (see section 3)
- scheduling fieldwork to ensure time is allowed at the end of work at each fieldwork location for hygiene requirements.

Additional planning requirements when working in a known risk estuary

- when fieldwork is being conducted in known risk waterways, such as an area where Pacific Oyster Mortality Syndrome (POMS) is known to occur (see section 3 and Appendix 2 for where to find further examples), fieldwork planning must ensure that either:
 - adequate supplies are available for cleaning and disinfection (which must be conducted when leaving known risk waterways), or
 - fieldwork occurs in isolation, thereby allowing all equipment to be thoroughly cleaned/disinfected and dried before re-using in another fieldwork location, or
 - separate dedicated sets of equipment are used in known risk waterways.

Note: any item can be a potential carrier for biosecurity matter contaminated with aquatic pests or diseases. Items not needed during the field work operations should remain at the worksite, at accommodation or within the motor vehicle's enclosed compartment.

3. Areas of known infestations of aquatic pests and diseases

Areas with a known history of infestations of with aquatic pests and/or diseases are referred to in this procedure as known risk waterways (see Appendix 2 for examples). Some are further categorised in legislation, for example the QX disease biosecurity zone described in Part 3, Division 2 of the Biosecurity Regulation 2017 where the zone includes all estuaries in NSW and these are split into high, medium, or low risk areas for QX disease. Control Orders published on the NSW DPI website can also be used to add further classifications, such as an estuary/area that is under investigation until further determination can be made. For the purposes of this procedure, low risk areas for QX disease are treated as unknown risk estuaries for that disease, except for those that are subject to Control Orders, General Biosecurity Directions or other measures whilst undergoing investigation or pending formal changes in Regulation on their categorisation.

- It is the responsibility of all NSW DPI and LLS staff and other persons/entities operating under this procedure to ensure that they have an adequate understanding of known risk pest and disease waterways and how to mitigate aquatic pest and disease risks associated with these, as well as how to reduce the risk of spread of aquatic pests and diseases in general. See Appendix 2 for examples and www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases for further information and check with the NSW DPI Aquatic Biosecurity team, including for emerging pest and disease threats, on 02 4916 3900.
- during an emergency or other significant response, emergency orders, control orders, or other legislative tools or procedures may be put in place that will offer a higher level of hygiene requirements. Current control orders can be found at: www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015
- Known risk areas require additional disinfection measures following cleaning (see section 5)
- Some pests and diseases also have specific cleaning and decontamination and disinfection requirements written into legislation (e.g. POMS and QX disease, both of which have specific cleaning requirements for oyster equipment used in waterways with known risk written into the [Biosecurity Order \(Permitted Activities\) 2019](#). For further information see in force statutory instruments at www.legislation.nsw.gov.au

- specific procedures may already be developed for particular activities (for example Decontamination processes for commercial Abalone divers: Standard operating procedure) which outlines hygiene measures which can be used for researchers and others to meet their responsibilities in reducing the risk of spread of disease when undertaking similar activities or working within the same habitat types. Search for “SOP Abalone divers” at www.dpi.nsw.gov.au

4. General guidelines for pre and post departure inspections

Pre-departure inspection:

- thoroughly check all aquatic fieldwork equipment for visible debris
- remove any visible debris, bag and dispose in general waste away from any waterway. The equipment should then be cleaned – (see section 5 and Appendix 1).
- where possible all fieldwork equipment should be dry before reuse.
- In addition, all equipment that has been or is to be used in areas with specific cleaning/decontamination/disinfection requirements (see section 5) is to meet the specific cleaning/decontamination requirements prior to use.

End of fieldwork inspection:

- this is done at the conclusion of field operations at each fieldwork location
- inspect all equipment thoroughly and remove any visible debris
- empty any excess water from fieldwork equipment (such as bilge of a vessel or engine bay of a vehicle) away from the boat-ramp when leaving a fieldwork location (may contain algae, mud, or debris)
- any collected debris should be placed in a sealed bag and disposed of into general waste away from the waterway.
- Any suspected aquatic pests or diseases found in the debris should be reported as per section 6 and the samples secured and stored in accordance with section 7 of this procedure.

5. Cleaning and disinfection

General cleaning

- cleaning should be undertaken when leaving each fieldwork location (with the exception of extenuating circumstances, such as rapid changes to weather). Workers should conduct cleaning according to the following steps:
 - following removal and appropriate disposal of debris as part of the end of fieldwork inspection (as per section 4 of this procedure), thoroughly clean equipment with a freshwater hose on site removing visible traces of mud,
 - where washing with a freshwater hose is not possible, use bottled clean/fresh water (water brought on the fieldwork trip especially for that purpose) to clean equipment as thoroughly as possible, addressing visibly dirty areas/high risk areas of equipment, and
 - where cleaning on site is not possible, all efforts should be made to remove bulk of debris/other material before moving to another suitable cleaning area (such as a commercial car wash).
- See below for a list of cleaning and disinfection supplies for fieldwork and see Appendix 1 for a checklist of areas to pay particular attention to for each type of equipment.
- Ensure that any specific cleaning and disinfection requirements are followed where given in legislation or standard operating procedures (see section 3 and note overleaf).

Disinfection

- disinfection is to be undertaken when leaving each fieldwork location that is a known risk waterway:
 - after cleaning, disinfect with an appropriate solution according to equipment type.
 - Ensure that the disinfection method also meets any specific requirements given in legislation or standard operating procedures for that waterway for activity (see section 3, Appendix 2 and note overleaf)

Examples of cleaning and disinfection resources and equipment

- car/truck wash facilities – self-service with high pressure & cleaning cycles or drive-through – when planning your trip map out those available near/between your sampling locations
- access to freshwater, where run-off containing potential pest and disease substances and cleaning detergents and disinfectants will not enter waterway
- cleaning equipment (e.g., hose with trigger nozzle, spray bottles, buckets, brushes, sponge) hose with trigger nozzle, spray bottles, buckets, brushes, sponge)
- Brushes for cleaning PPE and other equipment (e.g., broom or smaller brushes to suit equipment type)
- large containers or bottles of clean (e.g., potable) freshwater
- plastic foot baths and a suitable solution for footbaths
- plastic tubs to contain equipment for transport
- rubbish bags & ties – heavy duty
- PPE including gloves, safety glasses
- floor mat – for personal protection when inspecting under vehicles
- undercarriage mirror
- measuring container for cleaning & disinfecting solutions
- cleaning and disinfecting solutions/products (see below).

Examples of cleaning and disinfection solutions:

Note: This is not an exhaustive or prescriptive list. If other products are identified as practical for use, and achieve appropriate cleaning and disinfection, they can also be used:

- Detergent:
 - CT18: non-hazardous, non-dangerous goods. Is acceptable for use on unpainted surfaces, however, is known to be harsh on boat gelcoat polish/paintwork/aluminium.
- Disinfectant:
 - Virkon-S: this should be pre-mixed (according to manufacturer's instructions) and taken in the field in a suitable spray pack. After cleaning (removal of all mud, debris), spray down equipment with the Virkon-S mix and leave to dry.
 - Chlorine, iodine or other disinfectant prepared and used in accordance with relevant Australian Pesticides and Veterinary Medicines Authority (APVMA) permit for the pathogen or other use concerned (e.g., PER86206 for disinfection of Abalone Harvesting Equipment against Abalone Viral Ganglioneuritis). After cleaning (removal of all mud, debris), spray down vehicle with the solution and leave to dry.

Note: some known risk waterways and pests and diseases or activities have specific cleaning and disinfection requirements written into legislation placed on the NSW legislation website (www.legislation.nsw.gov.au) such the Biosecurity Order (Permitted Activities) 2019 which contains

the cleaning and decontamination requirements of oyster equipment, including vessels, used in known risk POMS estuaries and high and medium risk QX estuaries.

Other cleaning and disinfectant requirements for specific areas or activities can also be added to the NSW DPI website as needed in either Emergency Orders or Control Orders (see www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015).

Further cleaning and disinfection information may be written into Standard Operating Procedures (SOPs) saved on the NSW DPI website. For example the Decontamination processes for commercial Abalone divers: Standard operating procedure which can be adapted for people working in abalone habitats in order to meet their General Biosecurity Duty to reduce the risks associated with the spread of aquatic pests and diseases.

In waterways with more than one known pest or disease it is important to ensure that the specific cleaning and disinfection requirements for each of these pests or diseases are met.

Other general measures prior to moving to a new waterway or location:

- all parts of fieldwork equipment should be allowed to air or sun dry if possible, between fieldwork locations (particularly when sites are in a new catchment)
- cleaning and disinfection should be completed on site in a manner that ensures any soap/chemical residue does not enter the waterway. Where cleaning on site is not possible, all efforts should be made to remove bulk of debris/other material before moving to another suitable cleaning area
- where water is not available for cleaning (and workers are directed to continue field work in other locations) workers must check for and remove visible debris and all equipment must be dried before moving to a new fieldwork location
- after completing river crossings vehicles must be parked (preferably on a level area) with handbrake on and one or more wheels chocked on both sides. The vehicle and any trailers must be checked in areas described in Appendix 1 and any aquatic weeds and pests removed. An exception is when multiple river crossings are completed on a single tributary, however inspections must be completed before workers cross a new tributary.

6. Reporting suspected aquatic biosecurity threats

Any NSW DPI or LLS worker who observes suspected prohibited matter and notifiable matter aquatic pests or diseases while undertaking aquatic fieldwork is required to report these to NSW DPI Aquatic Biosecurity on:

- 1800 675 888 (24-hour Emergency Animal Disease Hotline) immediately for suspected prohibited matter and as soon as possible within one business day for notifiable matter. Also report suspicions of emerging pest and disease threats via this number.

Suspicions of notifiable matter can also be reported during business hours via:

- the email aquatic.biosecurity@dpi.nsw.gov.au
- the online reporting form found at www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/reporting
- the switchboard at Port Stephens Fisheries Institute on 02 4916 3900

NSW Aquaculture permit holders also have a duty to report mortalities and morbidities under the conditions of their aquaculture permit.

Note: never assume that a suspected prohibited or notifiable matter aquatic pest or disease has already been reported to NSW DPI Aquatic Biosecurity for attention/action and escalation as required – if in doubt phone 1800 675 888 immediately

Disease suspicions can only be confirmed via laboratory testing and should be reconfirmed each year for each waterway.

Both carp and Eastern gambusia are now considered to be widespread throughout NSW and are not legally required to be notified to NSW DPI Aquatic Biosecurity, unless specifically indicated in your permit. This does not negate any reporting requirements to NSW DPI Fisheries or Animal Welfare reporting requirements. Care still needs to be taken not to further move these species.

7. Destruction, disposal, and investigation of suspected aquatic diseases/pests

Any bulky debris that may include or harbour a suspected aquatic pest or disease must be disposed of appropriately.

Any additional specimens considered suspect should be reported to NSW DPI Aquatic Biosecurity on 1800 675 888 and humanely euthanised and held for potential identification or laboratory analysis unless advised that they can be appropriately destroyed and disposed of:

- aquatic pest destruction and disposal methods:
 - in the case of marine vegetation or aquatic pests (e.g., *Caulerpa taxifolia*) it is recommended that suspected pests or introduced vegetation is carefully placed in a plastic bag and disposed of away from the waterway to landfill
 - in the case of freshwater weeds (e.g., *Salvinia*, *Cabomba*, Alligator weed), it is recommended that the vegetation is carefully placed in a plastic bag and later disposed of by drying out the material and either incinerating or burying
 - in the case of fish it is recommended that suspected pest or diseased fish are humanely euthanised (according to NSW DPI guidance on acceptable methods) see the current [Guide to Acceptable Procedures and Practices for Aquaculture and Fisheries Research](http://www.dpi.nsw.gov.au/fishing/aquaculture/publications/general/a-guide-to-acceptable-procedures-and-practices-for-aquaculture-and-fisheries-research) found at www.dpi.nsw.gov.au/fishing/aquaculture/publications/general/a-guide-to-acceptable-procedures-and-practices-for-aquaculture-and-fisheries-research and general information for the public at www.dpi.nsw.gov.au/animals-and-livestock/animal-welfare/animal-care-and-welfare/other/companion-animal-files/humane-harvesting-of-fish-and-crustaceans and that they are disposed of away from the waterway to landfill. It is also lawful, though not recommended, to return notifiable pest fish species other than Mozambique Tilapia (see note below) to the water immediately at the point of capture. Live possession of all notifiable matter pest fish is illegal, unless otherwise authorised by a permit under the *Biosecurity Act 2015*.

Note: it is illegal to return any Mozambique Tilapia (*Oreochromis mossambicus*), otherwise known as Mozambique mouthbrooder, to the water, either dead or alive, unless otherwise specifically provided for in a permit under the *Biosecurity Act 2015*.

This species must be humanely dispatched and disposed of away from the waterway. Special care should also be taken to check for any eggs or young that may be present in, or that have spilled from, the mouth during capture, to ensure that these are destroyed and disposed of appropriately as well. For suspicions of Tilapia anywhere other than Cudgen Lake, where they are already established, call 1800 675 888 immediately. Take clear photographs and retain dead fish on ice or frozen till advised whether it will be required for testing to confirm the identification.

- investigation and collection:
 - in the event of a suspected detection of a range extension or a new incursion of an aquatic pest or disease or weed consideration should be given to:
 - taking a photograph of the specimen, and
 - collection of suitable samples for identification purposes, and
 - cessation of activities until investigation/identification is made if the activity is likely to increase risk of spread of the suspect pest/disease.

- aquatic fieldwork workers should contact NSW DPI Aquatic Biosecurity by phoning the 24-hour biosecurity hotline 1800 675 888 to make the report and for advice on appropriate sample collection and preservation methods. NSW DPI Aquatic Biosecurity will coordinate with workers for the collection and identification of any suspected aquatic pest or disease – please contact NSW DPI Aquatic Biosecurity for detailed procedures
- in the event that contact cannot be made with Aquatic Biosecurity, samples should be retained, in a sealed container, on ice where possible but not frozen, for identification or disease investigation until contact with NSW DPI Aquatic Biosecurity can be made
- for freshwater aquatic weeds call the NSW DPI Invasive Plants and Animals Hotline on 1800 680 244 or contact your local Council Weeds Officer.

Note: for suspicions of disease chill fish, but never freeze. Call 1800 675 888 immediately for prohibited matter or as soon as possible for notifiable matter. Keep fish samples sealed and on ice and await advice on whether laboratory examination will be required.

8. Definitions and acronyms

Aquatic pest: as per ‘pest’ definition in *Biosecurity Act 2015*, yet for the purpose of this procedure referring to animals included in the definition of fish under the *Fisheries Management Act 1994*, and to marine vegetation

Biosecurity matter: as per definition in Section 10 of the *Biosecurity Act 2015*

Caulerpa taxifolia: a bright green marine alga that is a listed notifiable aquatic pest species in NSW

Disease agent: as per definition in *Biosecurity Act 2015*

DPI: NSW Department of Primary Industries

EHNv: Epizootic haematopoietic necrosis virus

Fieldwork equipment: any item, vehicle, vessel, or PPE that is used during aquatic field operations

Fieldwork location: any NSW waterway where aquatic fieldwork is conducted. A waterway is considered a new fieldwork location if the worker has been required to travel by vehicle to get there or the waterway is disconnected from the previous fieldwork location

Known risk waterway: a waterway in NSW that has a known infestation of an aquatic pest (such as tilapia in Cudgen lake) or has had a known disease outbreak (such as QX disease or Pacific Oyster Mortality Syndrome)

LLS: Local Land Services

Notifiable Matter: as per definition in *Biosecurity Act 2015*

NSW waterways: includes any lake, coastal and marine waters, creek, river, stream, estuary, aquaculture lease area, aquaculture facility, private dam, aquaria, municipal water supplies. Also includes the interface between the waterways and land, riverbank, rocky shores etc

Oyster equipment: as per definition in the Biosecurity Regulation 2017 – note this encompasses a wide variety of equipment, including vessels

POMS: Pacific Oyster Mortality Syndrome, a viral disease that impacts Pacific Oysters that is known to occur in some estuaries of NSW

PPE: personal protective equipment

Prohibited Matter: as per definition in *Biosecurity Act 2015*

QX disease: refers to the disease caused by the protozoan *Marteilia sydneyi* that impacts the native Sydney rock oyster and is known to occur in several NSW estuaries.

Unknown risk waterway: a waterway in NSW that is not yet known to have an aquatic disease or pest present

9. Documentation

- Policy – Aquatic Biosecurity – pests and diseases
- Policy – Biosecurity collection, use and disclosure of information
- Policy - Biosecurity - Surveillance for pests and diseases of animals
- Policy - Records Management (IND-I-177)
- Policy - Information Security (IND-I-197)
- Policy - Classified Information (IND-I-196)
- Policy -Government Information (Public Access) (IND-I-178)
- Procedure - Biosecurity collection, use and disclosure of information
- Procedure – Pacific Oyster Mortality Syndrome incursion response
- Procedure – POMS oyster collection, storage and transport of samples
- Procedure – POMS oyster surveillance visits
- 'A guide to acceptable procedures and practices for aquaculture and fisheries research, 4th Edition October 2015'
- Weeds of National Significance - Cabomba control manual
- Weeds of National Significance – Alligator weed control manual
- Weeds of National Significance – Salvinia control manual
- Factsheet 1119 – Come Clean Go Clean – a step by step guide to vehicle wash down
- Factsheet 1152 – Vehicle biosecurity kit – plant industries
- Grains Farm Biosecurity Program Factsheet – Is your field research a biosecurity risk?
- Primefact 714 - Standard Operating Procedure: Decontamination for commercial abalone divers
- Australia's National List of Reportable Diseases of Aquatic Animals
- Primefact 1290 – Make 'clean' part of your routine
- Water safety management system (Fisheries Compliance Operations)

10. Records

Fieldwork records retained by NSW DPI and LLS workers or other people/entities covered by this procedure may be required by NSW DPI Aquatic Biosecurity in the event of a pest or disease incursion.

11. Revision History

Version	Date issued	Notes	By
1.0	01/07/2017	Substantially revised procedure in response to the <i>Biosecurity Act 2015</i>	Animal Biosecurity and Welfare

2.0

25/05/2022

Scheduled review of procedure

Aquatic Biosecurity
Policy & Programs
team

12. Contact

NSW DPI Aquatic Biosecurity Policy and Programs team –

- General Enquiries via the PSFI switchboard 02 4916 3900, or
- To report a suspect aquatic pest or disease 1800 675 888

Appendix 1 – Fieldwork equipment cleaning checklist

- ‘Vehicles’ includes cars, four-wheel drives, tractors, trucks, quad bikes, motorbikes:
 - prior to inspection, vehicles must be parked (preferably on a level area) with handbrake on and one or more wheels chocked on both sides
 - specific areas of vehicles that should be checked, cleaned, rinsed, disinfected, and dried include:
 - tyres
 - wheel guards (mudflaps) and arches
 - engine bays
 - underside (using undercarriage mirror)
 - chassis/body/tray
 - radiator grill
 - external fixtures (such as footsteps in 4WD)
 - carpets (if applicable)
 - hydraulics (if applicable/tractors)
 - steering wheel, gear shift and door handles.
- ‘Vessels and Trailers’ includes all watercraft, powered or non-powered, transportable or moored, and any trailer (including both watercraft and non-watercraft trailers):
 - specific areas of vessels and trailers that should be checked, cleaned, rinsed, disinfected, and dried include:
 - live-well
 - sump and bung area
 - deck
 - anchor, anchor rope and chain, and anchor well
 - engine
 - hull
 - carpets (if applicable)
 - bilge / buoyancy chambers (if applicable)
 - wheels (wheel guards, mudflaps)
 - all surfaces of trailers including underside
 - oars.
 - at the completion of sampling, lift all loose items from the deck of the boat and liberally rinse deck, live well and all equipment with clean water.
 - moored/berthed vessels: Vessels moored/berthed at a location can also act as a vector for the translocation of marine pests by carrying fouling on the hull. Regular slipping (or removal to trailer) and maintenance (e.g., cleaning, and anti-fouling) is required (e.g., at least annually). Operators of moored/berthed vessels should also ensure that marine or estuarine water is not transferred from one NSW waterway to another; marine or estuarine water carried on-board must be exchanged or dumped in offshore waters (not within an estuary)

before entering a new NSW waterway. Operators should also ensure that anchor and mooring lines are free from debris before they are deployed.

- ‘Aquatic fieldwork sampling equipment’ includes nets (e.g., seine, gill and fyke nets, dip or scoop nets, grapple hooks), fish and invertebrate traps, storage bins, buckets:
 - specific areas/parts that should be checked, cleaned, disinfected (in known risk locations) and dried include:
 - ropes
 - inside and outside of storage containers
 - nets, particularly around the knots (prone to capture aquatic debris)
 - cleaning of nets/ropes may include either hosing or soaking with freshwater (after working in marine environment), or by soaking in salt water (after working in a freshwater environment).
 - disinfectants should be applied, and the equipment should then be thoroughly rinsed. Note: residues on equipment may impact subsequent sampling, especially of live animals.
- ‘Electrofishing equipment’ includes backpack and boat electrofishing gear types:
 - in addition to those areas described under ‘vessels’, the specific areas of electrofishing equipment to be checked, cleaned, disinfected (in known risk locations) and dried include:
 - anodes and cathodes
 - foot switches
 - dip-nets
 - live wells
 - measuring boards.
 - disinfection of electrofishing equipment may be done using 1% pool chlorine solution
 - where possible, allow the boat and equipment to dry before re-packing for transport.
- ‘PPE and other personal gear’ include boots, waders, gloves, wet weather jackets and pants, backpacks, clothing, hard hat, high visibility vest, sunglasses:
 - before going into the field, PPE, clothing, and footwear should be checked to ensure it is generally clean and dry and that there are no visible fragments of biological material or soil
 - specific areas that should be checked, cleaned, disinfected, and dried include:
 - soles and outer parts of all boots, waders, and shoes
 - cleaning of PPE and other personal gear could be done using freshwater and a brush to ensure that biological debris and soil is thoroughly removed
 - if disinfection cannot be done PPE and personal gear must be thoroughly dried before using in a new fieldwork location
 - all PPE or personal gear made from neoprene or felt that cannot be disinfected must be completely dried for at least 24 hours when leaving each fieldwork location that is a known risk waterway.
- ‘Water sampling equipment’ includes water quality meters, probes, collection containers, buckets, and poles:
 - all water sampling equipment should be checked, cleaned, disinfected (in known risk locations) and dried

- if disinfection cannot be done, water sampling equipment must be thoroughly rinsed with freshwater and dried (with the exception of probes that must be kept moist) before using in a new area.
- ‘Electronic equipment’ includes notebooks, tablets, laptops, mobile phones, GPS etc. All electronic equipment should be checked, cleaned, disinfected (in known risk locations) and dried. If disinfection cannot be done, electronic equipment must be thoroughly wiped down and dried before using in a new area.

Note: add any additional specific cleaning requirements for known pests and diseases associated with the activity or waterway that you are working in (e.g., known waterways for POMS and QX disease). Some measures, such as those given in the Decontamination processes for commercial Abalone divers: Standard operating procedure could also be adapted for use on equipment used in abalone habitats. While this SOP relates to commercial Abalone divers, everyone has a responsibility to discharge their general biosecurity duty to reduce the risks posed by aquatic pests and diseases and should consider and suitably manage the biosecurity risks posed by any equipment used in similar ways in these environments.

Appendix 2 – Example of aquatic pest and disease risk mitigation resources for fieldwork planning*

*Note: the following is meant as an example, not as an exhaustive list and further aquatic pests and diseases apply. For further examples see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases and for freshwater weeds see www.dpi.nsw.gov.au/biosecurity/weeds

Pest or disease and impacts	Waterways, including their tributaries (and level of known risk)	Comments/resources/asures to assist in mitigating risk
<i>Marine and estuarine pests and diseases</i>		
Pacific Oyster Mortality Syndrome (POMS) – impacts on Pacific Oyster aquaculture industry	For known risk areas see Clause 50 of the Biosecurity Regulation 2017 at www.legislation.nsw.gov.au , other instruments at www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015 and map and further information at www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/aquaculture/poms	All oyster related equipment, including vessels, used in oyster related activities in high-risk areas for POMS, as well as any equipment to be kept in the water for extended periods at these areas to follow cleaning/disinfection requirements for oyster equipment relating to POMS in Clause 99 of the Biosecurity Order (Permitted Activities) 2019 see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/aquaculture/aquaculture/poms/omp and www.legislation.nsw.gov.au
QX Disease – impacts on Sydney rock oyster aquaculture industry and on NSW community and native species/environment	Includes high risk areas, medium risk areas and low risk areas as well as areas under investigation. See Clause 49 of the Biosecurity Regulation 2017 at www.legislation.nsw.gov.au , other instruments at www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015 and map and further information at www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/aquaculture/qx-oyster-disease	All oyster related equipment, including vessels, used in oyster related activities in high risk, medium risk and locations under investigation for QX, as well as any equipment to be kept in the water for extended periods at these areas to follow cleaning and drying requirements for oyster equipment relating to QX disease in Clause 98 of the Biosecurity Order (Permitted Activities) 2019 , see www.legislation.nsw.gov.au and www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/aquaculture/qx-oyster-disease
Abalone viral ganglioneuritis (AVG) – impacts on Abalone Industry and on NSW community and native species/environment	Not known to be present in NSW at time of update (April 2022) – is present in other jurisdictions, including Victoria and Tasmania. For further information see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pest-diseases/animal-health/wildfish-shellfish/avg	Never use any part of an abalone for bait or burley in NSW waters, it is illegal and heavy fines apply. Equipment for use within abalone habitats should follow the Decontamination processes for commercial Abalone divers: Standard operating procedure found at www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pest-diseases/animal-health/wildfish-shellfish/avg Seek advice from NSW DPI Aquatic Biosecurity team prior to bringing any equipment into NSW that has been used in

		the vicinity of abalone habitat outside of NSW
White spot disease of crustaceans, caused by White spot syndrome virus (WSSV) – impacts on prawn aquaculture, on other industries and environment and community of NSW	Not known to be present in NSW at time of update (April 2022) – detected in south east Queensland prawn farms and in the wild in Morton Bay	Never use prawns meant for human consumption as burley or bait and dispose of rubbish securely away from our waterways. Abide by the current Biosecurity (White Spot Disease of Crustaceans) Control order found at www.dpi.nsw.gov.au/about-us/legislation/list/biosecurity-act-2015 Seek advice from NSW DPI Aquatic Biosecurity team prior to bringing any equipment into NSW that has been used in prawn habitat outside of NSW
Tilapias – impacts on community, industries and native species and environment – Mozambique Mouthbrooder (<i>Oreochromis mossambicus</i>) named in world’s top 100 most invasive pest species. Superior breeding strategies, such as protection of eggs and young within the mouth	Confirmed high risk areas – Cudgen Lake in northern NSW – NSW’s only known population of Mozambique Mouthbrooder (<i>Oreochromis mossambicus</i>) Adapted to a wide range of habitats, both freshwater and estuarine, are within 3km of the Murray Darling Basin within Queensland, with recent reports that they may have actually reached these waters near Toowoomba, QLD	Permit under the <i>Biosecurity Act 2015</i> required for research in Cudgen Lake as likely to disturb Mozambique Mouthbrooder (<i>Oreochromis mossambicus</i>). For any suspected Tilapia encountered outside of Cudgen Lake take clear photographs and ring the 24-hour Biosecurity Hotline 1800 675 888 immediately. It is illegal to return Tilapia to the water, dead or alive.
Caulerpa (<i>Caulerpa taxifolia</i>) – only a small fragment is required to establish at new locations. Populations may fluctuate but extremely difficult to eradicate once introduced to new waterways. Impacts are not as severe as once thought.	For current and historic reports of this species see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/marine-pests/seaweed/caulerpa-taxifolia	A permit under the <i>Biosecurity Act 2015</i> may be required for research to be undertaken in areas where the risk of disturbing <i>Caulerpa taxifolia</i> is likely. Be on the lookout for this species, both for reconfirmation of previous areas and estuaries and for new areas and estuaries. Take clear photographs and email these to aquatic.biosecurity@dpi.nsw.gov.au
Freshwater pests and diseases		

<p>Redfin Perch (and Epizootic Haematopoietic Necrosis Virus, EHNV) – impacts on community and native species through competition and predation, can carry EHNV a disease that can impact threatened Macquarie Perch. Adapted to breed at a stunted size.</p>	<p>For Redfin perch known location map and further information see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/freshwaterpests/finfish-species/redfin-perch</p> <p>Areas of Upper Murrumbidgee and Lake Hume are known to have EHNV, as are areas in Victoria and South Australia, for further information see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/recreational-waterway-users/wildfish-shellfish/ehnv</p>	<p>Permit under the <i>Biosecurity Act 2015</i> required for possession of live Redfin perch, including for research purposes. Report sightings of this fish at new locations (if in doubt report it). Do not bring any equipment used in known EHNV waters into NSW</p>
<p>Tilapias – highly invasive – see section above on marine and estuarine pests and diseases for further information</p>	<p>Be on the lookout for both fish and nests as these species can establish in a wide range of habitats. Established population in Cudgen Lake, in northern NSW. Within 3km of Murray Darling Basin in Queensland, with recent reports that may have reached the basin near Toowoomba.</p>	<p>For any suspected Tilapia encountered outside of Cudgen Lake take clear photographs and call the 24-hour Biosecurity Hotline 1800 675 888 immediately. It is illegal to return Tilapia to the water, dead or alive.</p>
<p>Pearl Cichlids – impacts on native species through competition and predation</p>	<p>Several reported sightings within northern NSW (brackish and freshwater), both of the adults and of their nests</p>	<p>For any suspected sightings take clear photographs and call the 24-hour Biosecurity Hotline 1800 675 888.</p>
<p>Jack Dempsey cichlids – impacts on native fish through competition and predation</p>	<p>Green Pool, Angourie, northern NSW. Freshwater species, see www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/freshwater-pests/finfish-species/jack-dempsey</p>	<p>Popular aquarium fish, report all suspected sightings in the wild outside of current known location, and contact NSW DPI Aquatic Biosecurity team prior to undertaking works in Green Pool.</p>
<p>Oriental Weatherloach</p>	<p>Hawkesbury River, Murray River, Murrumbidgee River and Port Hacking catchments and in the tributaries of Lake Eucumbene. See www.dpi.nsw.gov.au/fishing/aquatic-biosecurity/pests-diseases/freshwater-pests/finfish-species/oriental-weatherloach</p>	<p>Take a clear photograph if possible and report all sightings to aquatic.biosecurity@dpi.nsw.gov.au</p>

<p>Didymo (also known as rock snot, a diatom) –</p>	<p>Be on the lookout for this pest, which is a significant pest in New Zealand and not yet known to be present in Australia</p>	<p>Do not use any equipment, including PPE and boots, that have been used in freshwater in New Zealand/elsewhere outside Australia in NSW waterways without first seeking advice from NSW DPI Aquatic Biosecurity (the smallest amount of this single cell diatom can pose a significant threat)</p>
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Please also be aware that other departments and local councils may have further provisions to protect against aquatic pests and diseases. For example, when planning to work in, on or adjacent to the Bellinger River please first contact the Department of Environment on info@environment.nsw.gov.au to ensure that your proposed activities do not contravene measures in place to protect the critically endangered Bellinger River snapping turtle from Bellinger River virus. It is your responsibility to ensure that you do what is reasonable to appropriately prevent, eliminate, or mitigate the pest and disease risks of all work that you do.