

# Health protocol for the movement of live marine crustaceans including crabs, lobsters and bugs

Aquaculture Protocol FAMPR004

Version 1

June 2011



This publication has been compiled by the Department of Agriculture, Fisheries and Forestry.

© State of Queensland, 2013.

The Queensland Government supports and encourages the dissemination and exchange of its information. The copyright in this publication is licensed under a Creative Commons Attribution 3.0 Australia (CC BY) licence.



Under this licence you are free, without having to seek our permission, to use this publication in accordance with the licence terms.

You must keep intact the copyright notice and attribute the State of Queensland as the source of the publication.

For more information on this licence, visit <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Signed: *[Handwritten Signature]*

Date 08/08/2011

# Contents

<b>Introduction</b>	<b>4</b>
<b>Diseases of concern for non-penaeid marine crustaceans</b>	<b>4</b>
<b>General requirements for the movement of marine crustaceans into Queensland</b>	<b>5</b>
<b>Specific approval conditions</b>	<b>5</b>
Health certification	5
Notification of intent to translocate	6
Post arrival mortality	6
<b>Hatchery quarantine</b>	<b>6</b>
<b>Farm grow-out</b>	<b>8</b>
<b>Summary of the special conditions for permitting the importation of marine crustaceans into Queensland</b>	<b>9</b>
<b>Relevant legislation</b>	<b>9</b>
<b>Contacts</b>	<b>10</b>
Submitting samples	10
<b>References</b>	<b>11</b>
<b>Appendix</b>	<b>12</b>
Other diseases of concern	12

Signed:  .....

Date 08/08/2011

## Introduction

In Queensland there are a small number of species of marine crabs and rock lobsters being cultured.

Mud crab (mangrove crab) *Scylla serrata*  
Blue swimmer crab (sand crab) *Portunus pelagicus*  
Three spot swimming crab *Portunus sanguinolentus*  
Moreton Bay Bug *Thenus australiensis*  
Painted rock lobster *Panulirus ornatus*

As well as an industry for the production of hard-shell crabs for the market, there was an intensive culture industry for soft-shelled crabs. Crabs for the hard-shell culture are hatchery produced whilst currently much of the stock for the soft-shell industry is small, non-regulated crabs sourced from the wild i.e. the three spot swimming crab and this latter activity would not currently be subject to the conditions of this protocol.

The movement of all aquatic animals is subject to the Management Arrangements for Translocation of Live Aquatic Organisms (transport between bioregions) for Aquaculture, Aquaculture Policy FAMOP015 and appropriate protocols for each species. There are exotic diseases of concern for the industry and these are listed below. For movement into Queensland all crustaceans must be health tested and certified free of the diseases listed below.

At this time there is no absolute means of identifying potential unknown diseases or strains of known diseases, hence the need for close attention to quarantine measures. It is important to note that despite the strict conditions for quarantine and testing there still remains an element of risk of disease in movement of live aquatic animals. The level of knowledge on diseases of crabs, lobsters and bugs is low compared to marine prawns and fishes. Newly emerging diseases may occur that will change the risks of movement of marine crustaceans and additional conditions or actions may be required by the Department of Agriculture, Fisheries and Forestry (DAFF) despite an approval to translocate under this aquaculture protocol.

It is important to note that under this protocol any activities requiring the provision of services by DAFF will be charged to the applicant at actual cost. Therefore, the applicant will need to assess what these costs will be before proceeding with the application.

Genetics is also an issue for consideration when decisions are being made to allow the translocation of live aquatic animals. Currently there is no specific written protocol for the assessment of the genetic risks associated with translocation, therefore these risk assessments will be made for each application for individual species based on available scientific knowledge.

## Diseases of concern for non-penaeid marine crustaceans

The major disease of concern on Queensland's Declared Disease List for marine crustaceans is:

- Crayfish plague (*Aphanomyces astaci*) – although the risk to marine crustaceans is unknown.

Other exotic diseases on Queensland's Declared Disease List which may be carried by marine crustaceans are:

- Taura syndrome
- White Spot Disease

Signed: 

Date 08/08/2011

- Yellowhead Disease.

Other diseases and disease agents of potential concern are listed in the appendix. Should the health testing identify any of the other diseases of concern, this may result in action being taken, which may include but not be limited to:

- banning the import
- approving the import conditional on effective treatment prior to the movement.

## General requirements for the movement of marine crustaceans into Queensland

1. A pre-consignment health check of each consignment of the crustaceans will be required. The Health Certificate or pathology report issued by the exporting State/Territory Authority, including the freedom from the infection identified above in the diseases of concern, will be sent to the Manager, Aquaculture, DAFF.
2. In the event that the exporting state, territory or region is unable to issue pre-consignment certification of the crustaceans (due the age and/or size of the crustaceans), then suitably qualified and experienced DAFF officers would need to inspect and sample (if indicated) the crustaceans on arrival at the biosecure facility.
3. A DAFF officer will need to inspect the site to confirm that required conditions have been met.
4. Each consignment of live crustaceans must be accompanied by documentation including:
  - a list of the individual box or carton identification numbers, and the scientific name and number of crustaceans corresponding to each container of the consignment;
  - the source location of the crustaceans;
  - the name and contact of the broodstock collector if relevant;
  - the importer's aquaculture approval number;
  - the name and address of the premises where the crustaceans will be held in quarantine on arrival in Queensland; and
  - a Health Certificate or report (as above) issued by the exporting state or territory fisheries or veterinary authorities declaring the crustaceans clinically healthy and free of gross lesions. The certificate or report should state that the crustaceans are free from any of the diseases listed on Queensland's Declared Disease List. If this documentation is unavailable due to the inability of the exporting state or territory to provide it then notification to DAFF is required to arrange inspection, including sampling if indicated, on arrival.

## Specific approval conditions

These are the development approval conditions for the movement of live aquatic animals into Queensland. For movement of live aquatic animals out of Queensland the producer should seek advice from the Veterinary/Fisheries Authority in the destination jurisdiction.

### Health certification

The species approved under this Authority must not be brought into Queensland for rearing without a health certificate or pathology report, issued by the exporting state or territory's fisheries or veterinary authority certifying the animal's health, which must include a statement that the specimens originate from:

1. a hatchery, farm, aquaculture premises or region which is recognised as free from infection by the diseases on the Queensland Declared Disease List based on the requirements listed in chapter 1.4 of the OIE Aquatic Animal Health Code , current edition (2009 or later) for recognition as free from infection; or

Signed:  .....

Date 08/08/2011

2. a hatchery, farm, aquaculture premises or region in which an appropriate targeted surveillance scheme over two years has been undertaken under the supervision of state or territory fisheries agencies or fisheries approved veterinary authorities and where the requirements for recognition as free from infection by diseases of concern for that species in chapter 1.4 of the OIE Aquatic Animal Health Code, current edition (2009 or later) have been met; or
3. a single batch of gametes, larvae, or early juvenile or adult of a species of crustaceans, isolated from open waters, which has been tested using suitable techniques to provide evidence that the batch is free from infection by diseases of concern on the Queensland Declared Disease List for that species.

## Notification of intent to translocate

The species approved under this authority must not be brought into Queensland for rearing unless an "Application to allow the Translocation of Live Aquatic Animals into and within Queensland" form (FDU1398) and a health certificate or pathology report has been completed and the Manager, Aquaculture, DAFF, has provided written acknowledgement and approval of the "Details of translocation form" and the pathology report.

The "Application to allow the Translocation of Live Aquatic Animals into and within Queensland form" and a signed copy of the health certificate or pathology report (as detailed above) must be given to the Manager, Aquaculture, DAFF, a minimum of three (3) working days prior to all shipments into Queensland. It is a requirement that the pathology report/health certificate is dated no more than 14 days before shipment date.

## Post arrival mortality

After arrival, any unusual clinical signs or mortalities in the stock must be reported immediately to the district officer of the nearest Queensland Boating and Fisheries Patrol office. If directed by a DAFF officer, the specimens must be forwarded to a veterinary laboratory as directed by the officer.

## Hatchery quarantine

A quarantine hatchery must separate any tank or area used for holding the imported broodstock or their sexual products or their progeny physically from areas/tanks used to hold local broodstock or their sexual products or progeny **OR** separate rearing runs of imported and local crustaceans by time. The separation must ensure biosecurity of imported crustaceans.

1. The structures and capacity to be a quarantine hatchery would require inspection and approval by a nominated DAFF officer before use. Further hatchery modifications may be required by DAFF. That officer will provide written advice to the Manager, Aquaculture, DAFF, that the hatchery meets these quarantine requirements.
2. Physical separation would have to be by complete enclosure, floor (drain) to ceiling by double plastic sheets a metre apart or other impervious washable surface to prevent aerosol spread of infectious organisms. All crustaceans must be kept in tanks. Biofilters are permitted, provided they are cleaned and disinfected by immersion in 100 mg/L active chlorine (or 100mg/L active iodine from an iodophor) for 60 minutes before reuse. Floors and drains must be impervious and have a washable surface.
3. The hatchery will ensure that no imported crustaceans leave the premises under any circumstances without the approval of the nominated DAFF officer. All dead imported crustaceans must be removed from tanks as soon as possible and placed in a plastic bag, ensuring the bag is clearly identified with the date, tank number and species of crustaceans. The dead crustaceans should preferably be stored in a freezer (domestic type at approximately  $-20^{\circ}\text{C}$ ), though storage in saturated brine solution or 80% ethanol is permitted.

Signed: 

Date 08/08/2011

4. Dead crustaceans, including the broodstock, are to be disposed of in an approved manner (refer to an authorised biological waste collection company or the AQUAVETPLAN Disposal Manual - <http://www.daff.gov.au/animal-plant-health/aquatic/aquavetplan/disposal>). Method of disposal to be stipulated in the application to translocate and accurate records kept of dates and numbers disposed for trace back purposes. No crustaceans, in particular the imported broodstock, are to be disposed of without the authorisation of the DAFF officer in charge of the translocation.
5. Hand and foot baths using iodophors or chlorine or alcohol at virucidal concentrations (at least 500 mg/L active iodine or chlorine) and replaced daily must be placed and used at any boundary between quarantine and non-quarantine areas.
6. All equipment e.g. probes, measuring cylinders, beakers, screens, clothing and footwear etc., used in the quarantine areas must be permanently identified as 'quarantine' and must not be used in non-quarantine areas unless cleaned in warm water with detergent, rinsed, disinfected by immersion in 100 mg/L active chlorine (or 100mg/L active iodine from an iodophor) for 60 minutes, rinsed and then sun-dried for 24 hours.
7. All water and waste (syphonings) from the hatchery must be held before discharge for disinfection with 200 mg/L active chlorine for 24 hours before aeration then discharge.
8. All hatchery work in quarantine areas is to be done by trained quarantine area-only staff i.e., staff who do not work in any non-quarantine area or by staff after they have completed all the necessary work to service non-quarantine areas in any one day.
9. After use all tanks, water pipes, airlines, drains, floors and walls of quarantine areas must be scrubbed clean with hot detergent water, rinsed, then chlorinated with 200 mg/L active chlorine solutions that is sprayed on and left for at least 60 minutes (or other agreed to disinfection method) and then allowed to dry.
10. All cleaning water must be held before discharge for disinfection with 200 mg/L active chlorine for 24 hours before aeration then discharge.
11. On arrival, the crustacean broodstock will be transferred to a quarantine tank and the imported water held and subject to disinfection (200 mg/L active chlorine) before discharged, and imported bags will be disinfected by immersion in 100 mg/L active chlorine (or 100mg/L active iodine from an iodophor) for 60 minutes prior to disposal.
12. Any unusual mortality of imported broodstock or their progeny must be reported immediately to DAFF. If requested samples must be provided to Tropical and Aquatic Animal Health Laboratory (TAAHL) or Biosecurity Sciences Laboratory (BSL) for examination. Measures will be taken by DAFF to limit the spread of any disease. Detection of an exotic viral infection will result in destruction of the affected crustaceans under DAFF supervision.
13. Tank numbered record sheets of broodstock and progeny are to be kept and are to be available for inspection by DAFF nominated officers during hatchery rearing and for 12 months thereafter.
14. All broodstock must be retained on the premises until authorisation to dispose of them has been received in writing from the nominated DAFF officer.
15. Before leaving the hatchery a random sample of 150 crustaceans from each nursery tank in the quarantine area must be submitted to TAAHL or BSL for histological examination (material submitted to TAAHL or BSL may be forwarded to a third party for more detailed virus analyses where considered appropriate). The detection of any exotic viral or other inclusions or any abnormal lesions will result in that tank of crustaceans being destroyed under DAFF direction. Following testing, written approval must be obtained from the laboratory before the stock is released into the ponds.

Signed:  .....

Date 08/08/2011

## Farm grow-out

1. Ponds holding the progeny of imported crustaceans should be kept separate from:
  - local east coast crustaceans
  - other batches of imported crustaceans.

It is recommended that the imported crustacean ponds be clearly identified as to the origin of the stock.

2. Provision must be made to be able to treat water from ponds containing progeny of imported crustaceans in the event of a disease outbreak – see development approval condition.
  - The control over the release of water from all ponds, tanks and drainage systems within the approved area must be maintained at all times.
3. Specific precautions must also be taken to prevent escape of imported crustaceans from grow-out ponds – see development approval conditions.
  - A perimeter barrier/fence, which is impervious, must be maintained, for all size classes of the species that are approved under this Authority which are capable of overland escape.
  - All reasonable and practicable measures to ensure that all waters (ponds, tanks, aquaria etc.) and associated plumbing, pumps etc on the approved area must be implemented and secured in such a way as to prevent the escape of any specimens (eggs, juveniles or adults) into Queensland waters.
  - Where waters are introduced for the aquaculture of the approved species, the developer must implement all reasonable measures to ensure all waters are sufficiently screened to prevent the movement of any juvenile or adult wild fauna (excepting zooplankton) into the approved area.
4. Measures to prevent predator access, such as netting or some form of screening, should be available or readily accessible for deployment in the event of a serious disease outbreak.
5. Equipment used in ponds with imported crustaceans should not be used in other ponds unless cleaned, disinfected (100 mg/L active chlorine for a least 60 minutes) then sun dried for 24 hours.
6. Any unusual mortality or stunting in imported crustaceans or the progeny of imported crustaceans must be reported immediately to DAFF and appropriate samples of these crustaceans must be provided to TAAHL or BSL for examination. Any detection of an exotic or suspected exotic disease will result in destruction of the entire pond of crustaceans and a disinfection of pond water prior to any discharge.

One percent mortality per day in the ponds should be regarded as unusual in this situation.

Another method of assessing unusual mortality is if there is any mortality in conjunction with **ANY TWO** of the following criteria:

- coming to the edge of the pond;
- demonstrating unusual swimming patterns;
- reduced feeding and failure to thrive; and
- changes in the physical appearance such as unusual colouration of prawn, erosion of tails fouling of gills or any other physical abnormality.

Signed: 

Date 08/08/2011



# Summary of the special conditions for permitting the importation of marine crustaceans into Queensland

Because the health certificate or pathology report from the exporting region or jurisdiction may be based on limited monitoring and surveillance testing of the wild and farmed crustaceans (other than penaeids) in that jurisdiction, the importing aquaculture development approval holder will need to apply for a permit to import non-indigenous fisheries resources. The permit, if approved, would incorporate the special conditions outlined below.

1. To provide suitable quarantine hatchery facilities at the property that could hold the non-indigenous broodstock during spawning and the progeny should be reared in a quarantine area separate from any local crustaceans in the hatchery. A nominated DAFF officer would need to inspect the property to ensure that there is effective physical isolation. Discharge water would have to be held, disinfected and rendered inactive prior to release.
2. Health testing of the post-larvae or early juvenile progeny of imported crustaceans by DAFF veterinary laboratories to determine health status before transfer from hatchery to the grow-out ponds.
3. The imported crustaceans should be reared in strict isolation in the grow-out ponds on the farm and should not be mixed with any crustaceans derived from local broodstock. Additionally batches of imported progeny from different sites and cohorts should also be reared in isolation from others.
4. DAFF officers would have the right to inspect the property at any time during normal business hours, seven days a week.
5. If at any time there were unusual mortalities (hatchery or farm), DAFF officers would need to inspect and quickly take steps to prevent any chance of spread of disease to wild crustaceans. Under section 96 of the *Fisheries Act 1994* there is power to require immediate destruction and appropriate disposal (with disinfection) of the broodstock, larvae, post-larvae or juveniles affected.
6. This protocol is designed for the production of marine crustaceans for human consumption. If the crustaceans are being cultured for the purpose of a future breeding program, it is highly recommended that the stock is held separately from the local crustaceans and there is an additional test of the health status before they go into the program.
7. Post larvae or early juveniles of non-indigenous broodstock may only be sold to aquaculture facilities that have current approval under this protocol to culture non-indigenous crustaceans by having met the quarantine requirements for holding non-indigenous crustaceans on the farm.

These conditions will apply for each consignment of imported prawns. A new permit will be required for each consignment.

## Relevant legislation

Refer to the Queensland legislation website for the most current version [www.legislation.qld.gov.au](http://www.legislation.qld.gov.au)

### Condition of approval

*Fisheries Act 1994*

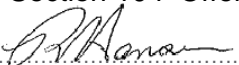
Section 79A 'Contravening a condition of an authority'

### Disease

*Fisheries Act 1994*

Part 5, Section 100 'Notice to be given about diseased fisheries resources or habitat'

Part 5, Section 104 'Offence to communicate disease to live fisheries resources or fish habitat'

Signed: 

Date 08/08/2011

Part 5, Section 105 'Offence to sell diseased fisheries resources and products'  
Part 5, Section 106 'Offence to leave diseased fisheries resources and products in a place'  
Part 5, Section 107 'Offence to bring diseased fisheries resources and products into Queensland'

## Contacts

### Submitting samples

Contact the Duty Pathologist before sending samples.

Submit **routine aquatic animal samples** for testing to:

Biosecurity Sciences Laboratory  
Health and Food Sciences Precinct  
Specimen receipt (Loading Dock 12)  
39 Kessels Road, Coopers Plains Qld 4108  
Phone: 07 3276 6062 (Aquatic Pathologist – submission enquiries)  
Fax: 07 3216 6620

In **northern Queensland**, for complex cases or where input is required to prepare samples, contact the Aquatic Veterinary Officer in Townsville **before** sending samples:

Tropical and Aquatic Animal Health Laboratory  
Department of Agriculture, Fisheries and Forestry  
18 Darter Street, Oonoonba Qld 4810  
Phone: 07 4760 1592 or 07 4760 1510 (Aquatic Veterinary Officer – submission enquiries)  
Fax: 07 4778 4307

If you need further assistance, please contact the Customer Service Centre on 13 25 23.

Signed:  .....

Date 08/08/2011

## References

AQUAVETPLAN Crayfish Plague Disease Strategy Manual, Version 1 (2005)

[http://www.daff.gov.au/\\_\\_data/assets/pdf\\_file/0003/156126/crayfishplague29Jun05.pdf](http://www.daff.gov.au/__data/assets/pdf_file/0003/156126/crayfishplague29Jun05.pdf)

Office International Des Epizooties (OIE), Paris. Aquatic Animal Health Code (2009)

[http://www.oie.int/eng/normes/fcode/en\\_sommaire.htm](http://www.oie.int/eng/normes/fcode/en_sommaire.htm)

[http://www.oie.int/eng/normes/fcode/en\\_chapitre\\_1.9.1.htm](http://www.oie.int/eng/normes/fcode/en_chapitre_1.9.1.htm) - crayfish plague

Anderson IG and Prior HC (1992) Baculovirus infections in the mud crab, *Scylla serrata*, and a freshwater crayfish, *Cherax quadricarinatus*, from Australia. *Journal of Invertebrate Pathology* 60:265-273.

Johnson PT and Lightner DV (1988) Rod-shaped nuclear viruses of crustaceans: Gut-infecting species. *Diseases of Aquatic Organisms* 5:123-141.

Kvingedal R, Owens L and Jerry DR (2006) A new parasite that infects eggs of the mud crab, *Scylla serrata*, in Australia. *Journal of Invertebrate Pathology* 3:54-59

Lavilla-Pitogo CR and de la Peña LD (2004) Diseases of Farmed Mud Crabs *Scylla* spp.: Diagnosis, Prevention, and Control. SEAFDEC Aquaculture Department, Iloilo, Philippines 89p

Li C and Shields JD (2007) Primary culture of hemocytes from the Caribbean spiny lobster, *Panulirus argus*, and their susceptibility to *Panulirus argus* Virus 1 (PaV1). *Journal of Invertebrate Pathology* 94:48-55

Mari J and Bonami J-R (1986) Les infections virales du crabe, *Carcinus mediterraneus* Czerniauski, 1884. In "Pathology in Marine Aquaculture" edited by Vivarés CP, Bonami J-R and Jaspers E, pp. 283-293. European Aquaculture Society, Special Publication No. 9, Belgium.

Signed:  .....

Date 08/08/2011

# Appendix

## Other diseases of concern

Other diseases and disease agents of potential concern in non-penaeid marine crustaceans:

### CRAB

#### Bacterial

- Luminescent vibriosis
- Chitinolytic bacteria

#### Fungal

- *Lagenidium*
- *Sirolopidium*
- *Halocrusticida*
- *Haliphthoros*

#### Viral

- Baculovirosis (*Scylla baculovirus* (SBV), Tau, Baculo-A and Baculo-PP)
- Viral inclusions in the digestive gland mud crabs of unknown cause

#### Protozoal

- Bitter Crab Disease - *Hematodinium perezii*
- Grey Crab Disease - *Paramoeba pernicioso*

#### Parasitic

- Rhizocephalan barnacle

### LOBSTER

#### Bacterial

- Limp Lobster Disease - *Vibrio* spp
- Milky haemolymph disease of spiny lobsters (*Panulirus* sp.)
- Luminous vibriosis of rock lobster – *Vibrio harveyi*
- Gaffkemia - *Aerococcus viridans*
- Vibriosis
- Shell disease – various bacteria implicated including *Photobacterium* sp.

#### Fungal

- *Haliphthoros* sp.
- *Fusarium solani*

#### Viral

- *Panulirus argus* virus type 1

#### Protozoal

- Bumper car disease - *Anophryoides haemophila*
- White tail – microsporidia
- *Hematodinium* spp

#### Parasitic

- Worms in ovary - *Thulakiotrema genitale*
- Cestode larvae – Metacestodes
- Bopyrid isopods

#### Other

- Shell blister disease

Signed:  .....

Date 08/08/2011