HELP PROTECT QUEENSLAND'S MARINE ENVIRONMENT

Queensland
marine pest and disease guide

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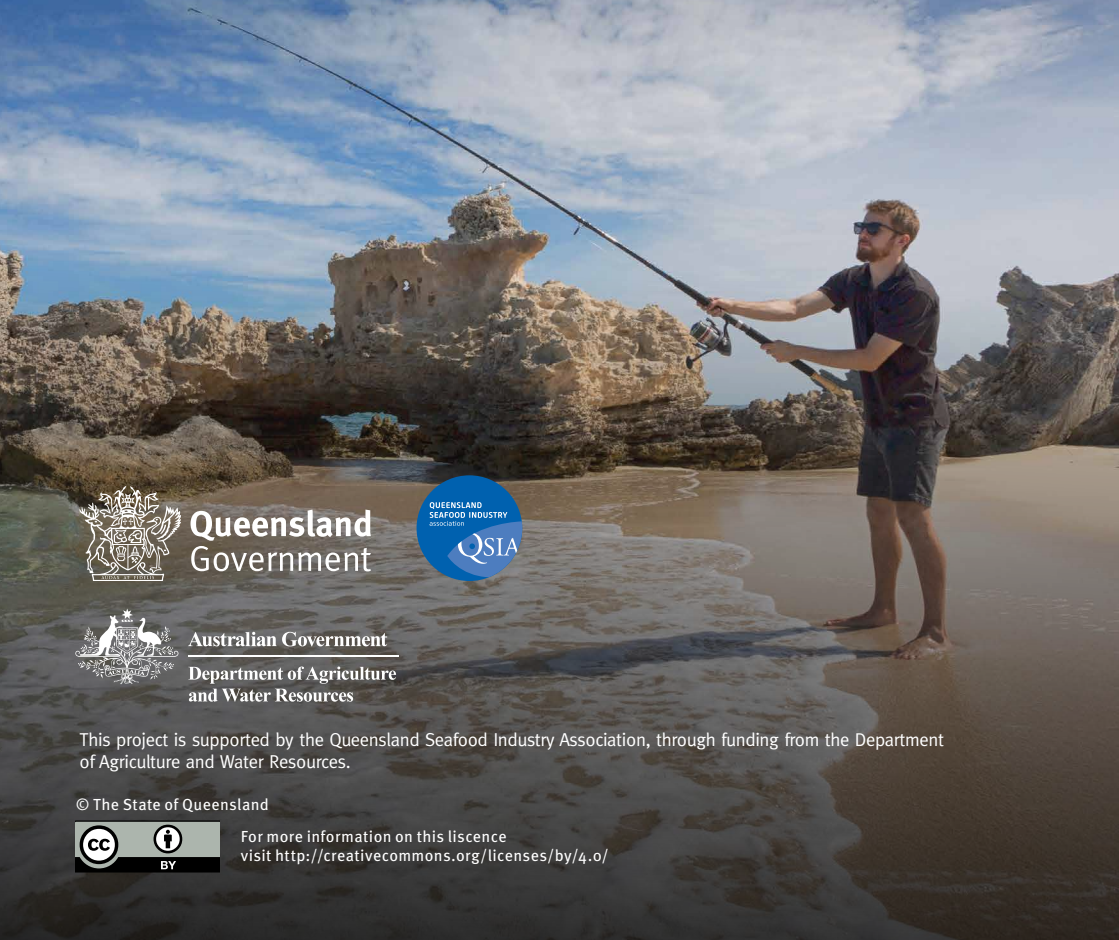
Queensland's seafood industry is vibrant and strong, injecting over $200 million dollars into the state's economy from primary production alone and directly employing more than 1500 people each year, as well as over 1200 people in associated industries such as onshore processors.

It is important that we protect this thriving industry, as well as our natural environment, from exotic marine pests and diseases, as outbreaks of either could leave devastating, long-lasting effects.

Commercial fishers are on the frontline of the industry and therefore best placed to monitor for exotic marine pests or diseases and report anything unusual.

This guide contains important information about how to identify the most significant marine pests and diseases, and how to report them.

All reports are encouraged and welcomed, as it is always better to be safe than sorry. If a suspected pest or disease is reported early it is more likely to be contained and eradicated, which means reporting could save your industry.



Queensland Government

QUEENSLAND SEAFOOD INDUSTRY association QSIA

Australian Government
Department of Agriculture and Water Resources

This project is supported by the Queensland Seafood Industry Association, through funding from the Department of Agriculture and Water Resources.

If you see a suspected marine pest or a sick or diseased marine animal follow these steps

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TAKE A PHOTO
of the suspected animal

COLLECT A SAMPLE
if you can and refrigerate it

REPORT IT
by calling Biosecurity Queensland **13 25 23**

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Fish disease

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A juvenile Murray cod infected with megalocytivirus - photo: Jeff Go

Infection with megalocytivirus (ISKNV, RSIV and like viruses)

IDENTIFICATION

- affected fish are lethargic and don't feed well
- respiratory distress (rapid movement of opercula)
- changes in body colour (e.g. darkening or lightening of body colour)
- pop eye (exophthalmos) and abdominal distension (due to fluid or enlargement of organs)

HOST SPECIES

Barramundi, snapper, sea mullet, threadfins, estuary cod, kingfish/cobia, Murray cod, red emperor, coral trout, coral reef fishes.

IMPACT

Mortality rates of infected fish is between 5 and 100 per cent.

SPREAD

These diseases can be spread via ornamental fish being used for bait or berley or ornamental fish being released into waterways.

LOCATION

Megalocytiviruses has not been recorded in Australian waters, however they have been detected in imported aquarium fish in retail pet stores in some states.

A channel catfish from the USA with signs of enteric septicaemia Photo: L.A Hanson

Enteric septicaemia of catfish

IDENTIFICATION

- lethargic and listless with occasional chaotic swimming
- swelling on top of the head progressing into ulceration (hole in the head)
- swollen abdomen due to fluid accumulation (ascites)
- bleeding ulcers at the base of fins, around the mouth, on the operculum
- red swollen anus with trailing faeces
- pop eye (exophthalmos)

HOST SPECIES

Barramundi, catfish (all).

IMPACT

This disease causes high mortalities (often exceeding 50 per cent) in cultured juvenile catfish in the USA.

SPREAD

This disease can be spread via ornamental fish being used for bait or berley or ornamental fish being released into waterways.

LOCATION

Enteric septicaemia of catfish has been reported in ornamental fish held in quarantine and some ornamental fish farms in Queensland, Tasmania and the Northern Territory. *Edwardsiella ictacluri,* the bacterial causative agent for Enteric septicaemia of catfish, was also detected at a prevalence of 40 per cent in apparently healthy freshwater catfish *Tandanus tropicanus* sampled at one site in the Tully River in northern Queensland.

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Haemorrhagic lesions in the fillet of a rainbow trout from Europe with viral haemorrhagic septicaemia.
Photo: T Håstein

Viral haemorrhagic septicaemia (VHS)

IDENTIFICATION

- affected fish are lethargic and don't feed well
- uncoordinated swimming
- swollen abdomen due to fluid accumulation (ascites)
- pinpoint haemorrhages (bleeding) under the eyes and throughout the fillet
- pale gills, pop eye (exophthalmos)

HOST SPECIES

Bream, eels (all), flatfish (all), hairtail, sea mullet, snapper, stout whiting.

IMPACT

This virus can cause significant mortalities (10–80 per cent) when water temperatures are below 18°C, especially in younger fish.

SPREAD

This disease can be spread via ornamental fish being used for bait or berley or ornamental fish being released into waterways.

LOCATION

VHS is exotic to Australia and has not been recorded in any state.

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A silver perch from NSW exhibiting a typical EUS lesion. Photo: R. Callinan NSW DPI

Epizootic ulcerative syndrome (EUS)

IDENTIFICATION

- red spots or burn-like marks with pale edges
- deep ulcerative lesions along the flanks
- erratic swimming and increased respiration

HOST SPECIES

Australian bass, barcoo grunter, barramundi, bream, bony bream, catfish, eels (all), estuary cods (all), flathead, golden perch, jungle perch, Macquarie perch, Murray cod, rainbow fish, sleepy cod, silver perch, mangrove jack, sea mullet, tilapia, whiting.

IMPACT

This disease often appears after acid water runoff following heavy rains, with the unsightly lesions reducing product marketability.

SPREAD

This disease is endemic in the wild in Queensland, so movement controls are unlikely, however interstate movements of live EUS affected fish may not be permitted (please check before moving EUS affected fish into other states or territories).

LOCATION

EUS is endemic in many freshwater catchments and estuaries in Australia and has been officially reported from New South Wales, Northern Territory, Queensland, Victoria, South Australia and Western Australia.

Crustacean diseases

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A black tiger prawn showing signs of white spot disease. Photo: Ben Diggles.

White spot disease

IDENTIFICATION

- prawns with white spot disease may have a loose shell with numerous white spots (0.5–2.0 mm in diameter) on the inside surface of the shell and a pink to red discolouration

HOST SPECIES

Crustaceans and marine worms.

IMPACT

When found in high intensity production areas, such as prawn farms, white spot disease results in rapid high-mortality of prawns.

SPREAD

White spot disease is highly contagious and can be spread via infected animals and water. To help stop white spot disease from spreading, prawns, yabbies and marine worms caught in the white spot disease restricted area, which runs from Caloundra to the NSW border and west to Ipswich, must not be removed from the area unless cooked first. It is also important to ensure raw imported prawns are not used as bait or berley.

LOCATION

White spot syndrome virus has been found in crustaceans in the Moreton Bay region of South East Queensland.

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A white shrimp with black lesions that are signs of chronic Taura syndrome infection. Photo: Don Lightner

Taura syndrome (TS)

IDENTIFICATION

- unusual swimming near the water surface and near the edge of water bodies
- reddish tinge to tail or appendages
- soft carapace
- multiple black (melanised) lesions on the carapace in chronic phase

HOST SPECIES

All prawns, mud crabs.

IMPACT

Taura syndrome virus causes high mortality in prawns, especially during moulting.

SPREAD

To stop Taura syndrome from entering our waterways make sure you do not use raw imported prawns as bait or berley.

LOCATION

Taura syndrome virus is exotic to Australia and has not been recorded in any state.

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Black tiger prawns from Thailand, the three on the left show signs of yellowhead disease. Photo: Don Lightner

Yellowhead disease (caused by YHV1)

IDENTIFICATION

- yellowish head and lighter coloured body with reddish tinge to appendages
- yellow soft swollen digestive gland (which makes the head appear yellow)
- white, yellow or brown gills
- unusual swimming near the water surface

HOST SPECIES

Prawns (all), freshwater shrimp.

IMPACT

Yellowhead disease causes high mortality in prawns, especially in high density environments such as prawn farms.

SPREAD

To stop yellowhead disease from entering our waterways make sure you do not use raw imported prawns as bait or berley.

LOCATION

Yellowhead virus genotype 1 (YHV1) that causes yellowhead disease is the most virulent genotype and has never been recorded in Australia. However other related genotypes do occur in Australia, including gill associated virus (YHV2, YHV6, YHV7), but these strains are much less virulent than the YHV1 strain.

Two white shrimp, both with shrunken, pale hepatopancreas (removed from head) typical of AHPND.
Photo: Don Lightner

Acute hepatopancreatic necrosis disease (AHPND)

IDENTIFICATION

- pale/white shrunken hepatopancreas
- soft shells
- black (melanised) spots or streaks in the hepatopancreas
- empty gut
- moribund prawns sink to the bottom

HOST SPECIES

Prawns (all), bait worms (polychaetes).

IMPACT

AHPND causes high mortalities in prawns, especially in high density environments such as prawn farms.

SPREAD

To stop AHPND from entering our waterways make sure you do not use raw imported prawns as bait or berley.

LOCATION

While the bacteria responsible for AHPND (*Vibrio parahaemolyticus*) is known to occur in Australia, specific strains of *V. parahaemolyticus* containing the genes that produce toxins (VpAHPND) have not been recorded.

Mollusc diseases

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Chinese scallops infected with AVNV have retracted mantles and a weakened shell closing reflex.
Photo: www.farm-2-market.com

Acute viral necrosis of scallops (AVNV)

IDENTIFICATION

- gaping and mantle retraction in adult scallops over two years of age
- weak shell closing reflex, mucous accumulation in the mantle cavity
- enlarged digestive gland, gill erosion and adductor muscle ulceration

HOST SPECIES

Scallops, clams/arc shells.

IMPACT

High mortality can occur (over 90 per cent within a week) when water temperatures are 18–20°C or above.

SPREAD

To stop disease like AVNV from entering our waterways do not use imported molluscs for bait or berley.

LOCATION

The strain of OsHV-1 virus responsible for AVNV has never been reported in Australia, and is considered exotic.

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Blacklip abalone infected with *Perkinsus olseni*, showing a pale nodule in the foot. Photo: Ben Diggles.

Perkinsus olseni

IDENTIFICATION

- in bivalves: gaping and weakened shell closure with pale nodules evident in internal organs
- in abalone: multiple pustules or creamy brown/yellow abscesses on the foot or mantle

HOST SPECIES

Pacific oysters, milky oysters, Sydney rock oysters, scallops, silver lipped pearl oysters, clams, black lipped pearl oysters, cockles, abalone, giant clams, razor shells.

IMPACT

High mortality can occur when temperatures exceed 20°C.

SPREAD

To stop the spread of *Perkinsus olseni*, do not move molluscs of unknown disease status from areas where *Perkinsus olseni* infections are known to occur, and do not use imported molluscs for bait or berley.

LOCATION

Perkinsus olseni has been reported in Queensland, New South Wales, Victoria, South Australia and Western Australia and found in a wide variety of wild and cultured molluscs including abalone, clams and pearl oysters.

Marine pests

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Asian green mussel

IDENTIFICATION

- juvenile shell bright green; older shells dark green to brown
- smooth exterior with concentric growth lines
- sexually mature at 3 cm long
- shells up to 16 cm

HABITAT

- hard substrates (vessels, artificial structures, wharves, aquaculture equipment, intake pipes, buoys)
- low tide mark to 10 m depth, lower estuarine to marine
- tropical to warm temperate

IMPACT

- fast growing and outcompetes native species, forming dense colonies
- fouls hard surfaces including vessel hulls, wharves, buoys, pontoons
- can clog seawater cooling pipes and intake systems

LOCATION

Asian green mussel has been detected in Queensland several times, most recently near Weipa in North Queensland, but no populations are known to exist in the environment and it is considered exotic to Australia.

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Asian bag mussel

IDENTIFICATION

- smooth, thin, fragile shell, which is olive green to brown in colour
- exterior shell pattern to dark zigzag markings and radiating ridges
- interior shell pattern to wavy purple to red zig zag lines and high lustre
- small mussel up to 30 mm in length

HABITAT

Asian bag mussels cluster together in soft substrates (usually sandflats/mudflats) in intertidal to subtidal habitats, but have also been known to foul hard substrates (such as ship hulls).

IMPACT

- burrows into sediments and produces protective cocoon that joins with cocoons of neighbouring mussels to form dense mat – mats of mussels can dramatically alter physical, chemical and biological characteristics of natural seafloor habitat
- can dominate seabed communities and exclude native species
- can reduce productivity of aquaculture and of commercial and recreational fisheries

LOCATION

Has been introduced to parts of New Zealand and Australia, but populations are not known to exist in Queensland.

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Black striped false mussel

IDENTIFICATION

- dark brown/black to white
- shell valves unequal in size, one side marginally overlaps the other
- shell is smooth, small and easily crushed
- forms dense clusters
- shell sometimes zig zagged or striped
- shell up to 25 mm long

HABITAT

- subtropical to tropical
- estuarine to marine
- up to a few metres deep
- hard vertical surfaces (e.g. hulls and pylons)

IMPACT

- fast growing and can displace native species
- mass fouling of wharf pylons, marinas, vessel water intake systems and marine aquaculture farms
- threatens industries such as fishing and aquaculture

LOCATION

Not found in Australia. Native to the tropical central Atlantic Ocean (Caribbean Sea) and has become established in Fiji, Indonesia, Singapore, Malaysia, Taiwan, India, China and West Africa.

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Brown mussel

IDENTIFICATION

- dark brown in colour
- smooth with concentric growth lines
- shell is thin at the edges and thickens towards narrow end
- straight and proportionally long hinge line
- shell is up to 12 cm long

HABITAT

- hard and soft substrates (dead shells, rocks, piers, stones, buoys)
- intertidal and subtidal
- prefers areas rich in organic matter and plankton, carrying low loads of suspended sediments

IMPACT

- fast growing; outcompetes native species, forming dense colonies
- fouls hard surfaces including vessel hulls, wharves, buoys, pontoons
- can clog seawater cooling pipes and intake systems

LOCATION

Not found in Australia. The brown mussel is an invasive mussel, native to tropical and subtropical waters of Africa and introduced to the northwestern Indian Ocean, Gulf of Mexico, Caribbean Sea and southwestern Atlantic Ocean.

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Harris mud crab

IDENTIFICATION

- adult shell width 10–20 mm
- greenish brown to olive green with white-tipped claws
- claws of unequal size
- shell has four blunt spines on each side

HABITAT

- prefers sandy and muddy substrates with a sheltered structure (decaying vegetation, oyster reefs, shells and rocks)
- lives in subtidal estuaries in areas with low salinity
- tolerates a wide range of temperatures and salinities

IMPACT

- alters food webs and displaces native crabs, crayfish and bottom-dwelling fish
- can form dense groups and clog water intake pipes and power plant cooling systems
- carrier of prawn and crab diseases

LOCATION

Not found in Australia. Harris mud crab is native to the Atlantic coast of the Americas from New Brunswick to northeast Brazil. It is a highly successful invader, having established in twenty countries.

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Chinese mitten crab

IDENTIFICATION

- hairy 'mittens' on claws unlike any Australian crab
- four spines on either side of eyes
- four sharp spines in between eyes
- shell is smooth and up to 8 cm wide

HABITAT

- burrows into mud on river banks, estuaries and coastal areas
- lives mainly in freshwater, but adults move into estuarine waters to mate
- lives in temperate and tropical waters

IMPACT

- damages fishing gear and impacts aquaculture activities
- blocks cooling systems of power plants and damages agricultural crops and infrastructure (irrigation channels)
- alters food webs and competes with native crabs and crayfish

LOCATION

Not found in Australia. The Chinese mitten crab is an invasive crab, native to Asia (China to the Korean Peninsula). It has successfully invaded temperate regions in central and northern Europe and North America.

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Japanese seaweed (Wakame)

IDENTIFICATION

- smooth thin, golden-brown blades
- conspicuous midrib along length of blade
- spore-bearing ruffle near base of mature plant
- claw-like attachment holdfast
- mature plants present only from early winter to mid-summer
- microscopic alternate life stage
- up to 1 m long (rarely to 3 m)

HABITAT

- temperate coastal waters
- lower intertidal to 20 m depth
- attaches to rocks, reef and stones, and fouls vessels, artificial structures and aquaculture equipment

IMPACT

Grows rapidly on any available space and can form dense beds on sheltered reefs.

LOCATION

Wakame has been found in Tasmania and in Victoria. It is not known to exist in Queensland.

Decontamination and biosecurity

Biosecurity is about preventing the introduction and spread of exotic pests and diseases.

Unfortunately, biosecurity breaches do occur and new pests and diseases can emerge or be introduced via various pathways. If an exotic pest or disease is found in a new area there are several options available to manage the situation and try to minimise the damage to industries and the environment.

The first step is to try to eradicate the pest or disease and return the area to a pest or disease free zone. Commercial businesses and the community may be adversely affected by eradication efforts in the short-term, however, the long-term benefits of returning to business-as-usual are much greater than the short-term impacts involved with eradication.

Containment is also an extremely important process because pests and diseases can spread a long way very quickly by human assistance, much faster than they spread by natural processes.

It is also important to ensure clothes and equipment are thoroughly cleaned as diseases can spread on contaminated clothing, boats, vehicles and equipment.

Strict controls on the movement of pests as well as infected animals and contaminated equipment are required to prevent rapid movement of these pests and diseases to new areas.

It is vital that fishers abide by these controls as they are in place to protect both the natural environment and our primary industries.

For more information on biosecurity and how to create a biosecurity plan, visit the Queensland Seafood Industry Association **qsia.com.au/biosecurity.**

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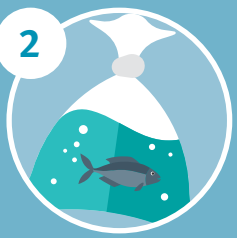

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