Ministry for Primary Industries
Manatū Ahu Matua

CLEAN BOATS – LIVING SEAS

Protect our waters from harmful marine pests. **A boatie's guide to marine biosecurity.**

Growing and Protecting New Zealand

Two simple activities you can do to protect New Zealand waters:

- Keep your boat bottom clean – regularly clean your hull and keep your antifouling paint in good condition.

- Be alert for sea life that looks different when boating, fishing, diving and at the beach. If you spot something out of the ordinary – take a note of its location, collect a sample or photograph if possible, and immediately call **0800 80 99 66**.

WHAT'S MARINE BIOSECURITY

GOT TO DO WITH ME?

If you're reading this material, chances are you love the sea. It's likely you use it for recreation or your livelihood, or both.

New Zealand's unique coastal environment is increasingly under threat from introduced marine pests. When they establish out of their native locations, some foreign (known as exotic) marine organisms can cause irreversible damage in their new environment.

Eudistoma elongatum sea squirt on beach in Northland

Marine pests can overrun natural ecosystems, displace native species, harm the fishing, marine farming, transport and tourism industries and even, in extreme cases, affect human health. In short they can seriously damage the things you value. As a boat owner or operator, you have a vital role to play in protecting New Zealand's waters.

Styela clava sea squirt fouling mussel lines and making harvesting difficult on Waiheke Island

MARINE BIOSECURITY – EVERYONE PLAYS A PART

The Ministry for Primary Industries (MPI) and regional councils are responsible for marine biosecurity. Work programmes are underway to help prevent marine pests arriving in New Zealand in the first place, to detect and take action against any new arrivals, and to help manage any that do become established.

But protecting New Zealand is not just government's job. As a boatie you can help prevent the spread of those marine pests already in our waters. And the more people we have keeping watch for anything that may be a new exotic pest, the greater our chances of detecting it early and managing it.

It is a scientific fact that marine pests travel on boat hulls. A report by the National Institute of Water and Atmospheric Research (NIWA) estimates that of the known introduced marine species in New Zealand, some 70 percent had arrived in hull fouling.

The message is clear – keep your boat bottom clean. Pests are unlikely to hitch a ride on a clean hull.

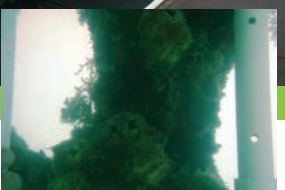
ARE YOU

A BIOSECURITY RISK?

It can be difficult for the untrained eye to tell from the surface if a boat is a biosecurity risk or not.

The safest rule of thumb is to ensure your boat hull never carries more than a slime layer and ideally this is regularly brushed or wiped off. Your boat should also have a regular out-of-water clean and a liberal coating of antifouling paint.

A waterline like this...



...can reveal this underwater (*Styela clava* sea squirt amongst hull fouling on yacht).

Very clean hull – minimal biosecurity risk.

Moderately fouled hull – needs a clean. Fouling organisms already present and fertile ground for marine pests to take hold.

Goes without saying.

Dirty boat as seen from above water – poses a biosecurity risk and requires cleaning.

Growth after approximately three years without a clean.

KEEP YOUR BOTTOM CLEAN!

Any vessel that remains moored in seawater (yachts, launches, fishing/aquaculture boats, ferries, barges) can collect marine pests in the growth that accumulates on the vessel bottom. These can then drop off and establish in new locations.

In order to be a biosecurity-safe mariner, it is ideal to give your hull regular in-water attention, removing slime before it builds up to more serious growths.

As well as making cleaning easier when you do dry dock, slip or haul out your boat, a clean boat (or one with a light slime coating) poses little biosecurity danger.

Light in-water cleaning should only be undertaken at your usual mooring, berth or marina. It pays to check with your local council or marina about rules and by-laws as some regions don't allow in-water cleaning because of the risk of releasing contaminants in paint.

A slime layer is easily removed with a water blast.

Do not clean your hull in the water if it has more than a slime layer on it.

HAULING OUT

FOR A GOOD CLEAN

The only way to ensure a good thorough clean is to slip or haul out your boat. You should always haul out your vessel for cleaning if it is carrying any more than a slime layer. Regularly cleaning out of the water and replacing your antifouling paint should be a fact of life for boat ownership. And that's not just for biosecurity. As most boaties know, keeping the hull clean improves performance, reduces running costs and prolongs the life of your vessel.

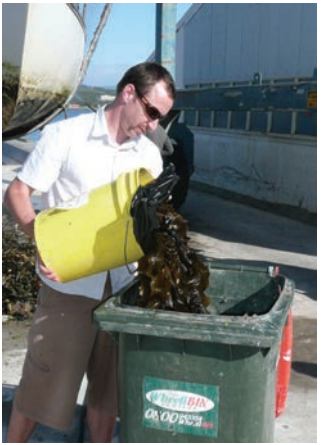
The following are guidelines for cleaning your hull if you are doing it yourself. When out-of-water cleaning, where possible, arrange to haul your boat out at a facility where waste hull-wash water is contained and treated before going back into the sea or is discharged to a municipal sewerage system. Once again, your local city or regional council or marina will be able to guide you on the best facilities for your needs.

GUIDELINES

FOR OUT-OF-WATER CLEANING

Remove all visible fouling, including mussels, barnacles, seaweed etc.

Dispose of all debris to a rubbish bin that will go to a land-based refuse dump. Some pests are very tough and can survive being out of water for a long time, and some are even encouraged to reproduce after being out of the water for some time. So don't dump debris where it might end up back in the ocean.



GUIDELINES

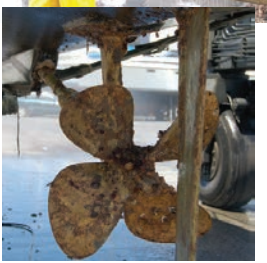
FOR CLEANING (CONTINUED)

Hose and brush down surface to remove all fouling. Waterblast where required.

Pay particular attention to what are known as “niche areas” on your boat – areas that stick out or contain water where marine organisms could attach or hide.

These include:

- keel and stabilisers;
- intakes and outlets;
- propellers and shafts;
- rudders and casings;
- through-hull fittings;
- earth plates, transducers and areas where antifoul has not been applied such as where the hull has rested during the last painting;
- anchors and anchor wells.



ANTIFOULING PAINT

The best way to avoid fouling build-up is to have your hull coated with an appropriate antifouling paint.

Your antifoul should be replaced at the interval recommended by the manufacturer or retailer, if the paint has been scraped or damaged, or if it is no longer effective.

The antifouling paint used should be suitable for the material of the hull, the type of boat and how the vessel is used. Factors to be considered in this are the speed of travel, time kept at mooring or berth and the water conditions around your boat. Be sure to strictly follow the manufacturer's and or retailer's instructions.

If you're unsure about what antifouling paint to use, get advice from your local marine chandlery or marina slipyard.

TRAVELLING

– OUT OF YOUR REGION OR INTERNATIONALLY

If you are moving to a new area, ideally clean your hull before you set off. Preferably slip or haul out for a thorough out-of-water clean and antifoul before a voyage such as a holiday, working in another region or a relocation trip. Antifouling should help you avoid picking up any nasties while you are away.

If you are returning to New Zealand after boating internationally, it is very important to make sure you're not bringing back hitchhiking marine pests.

If possible, you should check and clean any debris from your hull before you leave your last offshore port or location. If you are unable to carry out a full haul-out and antifoul application at this stage, you should arrange to haul out your vessel as soon as possible after arrival back in New Zealand.

Maintenance after returning from a voyage must be in a boat maintenance facility that has containment systems and treatment of all waste and cleaning run-off. The MPI inspector clearing your vessel on return will be able to advise you on a suitable facility and may direct you there if they consider you pose a biosecurity risk.

ADDITIONAL BIOSECURITY INFORMATION

Most of you know salt water is hard on vessels and gear. Washing your boat, fishing gear and dive gear with fresh water after every use will prolong its life and reduce the risk of spreading marine pests.

Trailer Boats

Trailer boats can also relocate marine pests when moved from location to location. Before moving your boat and trailer:

- Rinse down boats, trailers and all gear thoroughly with fresh water.
- Remove any debris such as weeds, crabs, barnacles – and check the anchor well, as weeds and other organisms are often brought up on the anchor and chain.
- Drain or thoroughly rinse areas where seawater might pool.
- Where possible, allow to air dry for several days before using in the new location.

Trailer boats can also transport marine pests.

Recreational fishers

- Remove any marine debris such as weed from your gear when leaving one location.
- Rinse all gear thoroughly with fresh water between locations, and if possible, thoroughly air-dry.
- Don't transfer live bait between locations.
- Don't dump offal from cleaning your catch or old bait back into the ocean – put it in a rubbish bin.

Divers

- Rinse and soak gear in fresh water, preferably rinse with a wetsuit cleaning product.
- Remove all debris such as seaweeds.
- Allow gear to air-dry for a few days where possible.
- Please don't relocate live organisms between locations – while you may feel this is replenishing an area, you may accidentally be spreading pests or diseases that could have negative impacts on the new location.

ADDITIONAL BIOSECURITY INFORMATION FOR FISHING AND AQUACULTURE INDUSTRIES

Handling marine equipment – e.g. ropes, buoys and lobster pots

Where possible, avoid moving equipment between regions – i.e. keep it local.

If this is not possible, the equipment will need to be cleaned and sterilised by one of the methods below:

- **Remove** the item/s from the water and thoroughly air-dry. The item/s should be left out of the water for a month. Care is needed to ensure ropes and equipment are not laid out in a manner that prevents the surfaces from drying out.
- **Soak** the item/s as below:
  a. Soak in freshwater for 72 hours. If soaking ropes, freshwater should be replaced after 12 hours to ensure the water does not remain brackish.
  b. Soak the item in a 2 percent bleach/freshwater solution for a 30 minute period. (2 percent solution = 200 mls of bleach or detergent into 10 litres of freshwater).
  c. Soak the item in a 2 percent Decon 90 detergent/freshwater solution for a 30 minute period.
  d. Soak the item in a 4 percent acetic acid/freshwater solution for a 10 minute period. Rinsing afterwards is optional. (4 percent solution = 400 mls of acetic acid into 10 litres of freshwater).

If your industry has a Code of Practice, please refer to its section on biosecurity.

Those involved with aquaculture should consider how they can minimise their biosecurity risks when moving stock, e.g. spat collection, capture of broodstock and transfer of stock between locations.

Disease

New Zealand is lucky in that its geographic isolation means it is relatively free from disease. Commercial fishers and the aquaculture industry are encouraged to keep an eye out for anything that may be an exotic disease, such as mass illness or deaths. While MPI has stringent measures at the border to minimise the risk of exotic diseases entering New Zealand, sectors are encouraged to develop an emergency response plan in case of disease outbreak.

BE OUR BIOSECURITY EYES

As someone who spends time around the sea, you are well placed to notice something out of the ordinary.

Exotic marine organisms can establish and spread very quickly so it's important suspicious finds can be assessed and identified quickly. The sooner control is attempted, the more successful it is likely to be.

If you believe you've found something unusual, please:

- carefully note its location;
- grab a sample if you can – for anything other than seaweed, place sample in a plastic bag and freeze, and for weed samples, liberally sprinkle with salt, leave overnight, then drain off liquid and place in plastic bag;
- Contact MPI immediately tollfree on: **0800 80 99 66**.

MPI has identified eight marine pests (some of which are already in New Zealand) that can cause serious problems once established. These particular pests are featured on the following cards. Please contact MPI urgently if you believe you have seen one of these pests.

Call MPI tollfree on: **0800 80 99 66**

ASTERIAS AMURENSIS NORTHERN PACIFIC SEASTAR

Identifying features

- Five rays or arms, with pointed upturned tips.
- Yellow, orange or red, with purple markings on top – uniformly yellow on bottom.
- Generally 12-24 cm across, but can grow to 40-50cm.

The threat

The Northern Pacific seastar is a voracious feeder, eating wild and farmed shellfish and a wide variety of other marine animals. It could have a serious impact on our aquaculture industry and our marine environment generally.

Think you've seen this starfish? Call MPI free on 0800 80 99 66

Where is the Northern Pacific seastar found?

- Below the tideline on mud, sand and pebbles.
- To depths of 200 metres, but generally above 20 metres.
- Prefers sheltered areas.
- Forms large groups around food sources, e.g. mussel lines, wharf pilings, shellfish beds.

What looks similar to it?

Several New Zealand native seastars (starfish), BUT natives do not have the distinctive upturned tips of the Northern Pacific seastar, and differ in colour.

Sclerasterias mollis
Cross fish
Brick-red to orange, with yellow bands and NO turn-up on tips.

Allostichaster insignis
Three-and-three star
Usually has six arms and NO turn-up on tips.

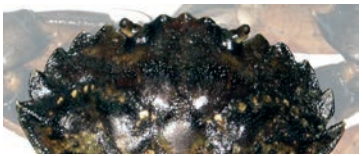
Astropecten polyacanthus
Comb star
Rows of spines around edges of arms, brownish red to fawn and NO turn-up on tips.

If you think you have seen the Northern Pacific seastar:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

CARCINUS MAENAS EUROPEAN SHORE CRAB

MARINE PEST GUIDE



Identifying features

- Body shell about 8 cm wide.
- Usually greenish coloured with occasional red/orange tint.
- No swimming legs or paddles.
- Close up, there are three blunt spines between the eyes.
- Five sharp spines behind each eye on edge of body shell.
- Generally not aggressive when handled.

The threat

The European shore crab has a broad diet and can survive in a range of environments, making it a significant threat to coastal seabed communities.

Think you've seen this crab? Call MPI free on 0800 80 99 66

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Where is the European shore crab found?

- Sheltered rocky shores.
- In crevices, spaces under boulders, or buried in sand between rocks.

What looks similar to it?

Three different New Zealand native crabs look similar, but are all distinguishable from the European shore crab by colour or physical characteristics.

Ovalipes catharus
Common swimming crab
Has rear swimming/paddle legs and is pale pinkish-brown.

Hemigrapsus sexdentatus
Common or Purple rock crab
Purple grey in colour and no spines between the eyes.

Leptograpsus variegates
Large shore crab
Purple brown colour and no spines between the eyes.

If you think you have seen this crab:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

ERIOCHEIR SINENSIS CHINESE MITTEN CRAB

MARINE PEST GUIDE

Identifying features

- White-tipped hairy front claws.
- A deep notch between the eyes.
- Four spines behind each eye on the edge of the shell.
- Rounded smooth brown shell.
- Legs generally twice as long as the shell.
- No swimming legs (paddles).

The threat

The Chinese mitten crab is a highly invasive species that can cause major ecological and economic damage. This crab burrows into sand banks and streambed walls causing significant erosion of estuary shores.

Think you've seen this crab? Call MPI free on 0800 80 99 66

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Where is the Chinese mitten crab found?

- Tidal creeks, rivers and estuaries.
- Burrows into sand, mud or clay banks.
- Young crabs occur in freshwater, migrating to salt water when adult.

What looks similar to it?

Three New Zealand native crabs live in similar habitats, BUT these native species are all smaller and have distinct physical differences from the Chinese mitten crab.

Helice crassa
Tunneling mud crab
Claws not white-tipped and no spines on front of shell.

Hemigrapsus crenulatus
Hairy-handed crab
Claws not white-tipped and no spines on front of shell.

Macrophthalmus hirtipes
Stalk-eyed mud crab
Claws not white-tipped and no spines on front of shell.

If you think you have seen this crab:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

CAULERPA TAXIFOLIA – A MARINE AQUARIUM WEED

MARINE PEST GUIDE

Identifying features

- Bright green seaweed with horizontal runners up to nine metres long. Many upright fronds sprout from these runners.
- Fronds are flattened with a smooth and distinct midrib.

The threat

Caulerpa taxifolia is a fast-spreading weed that can cause major ecological and economic damage.

The most likely way of it arriving in New Zealand is through importation for aquarium use.

If *Caulerpa taxifolia* is released into New Zealand marine environments there is a high risk of it establishing, as aquarium strains in particular are highly successful in a wide range of environmental conditions.

Think you've seen this weed? Call MPI free on 0800 80 99 66

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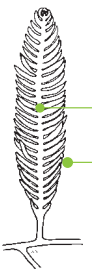
Where is *Caulerpa taxifolia* found?

- *Caulerpa taxifolia* grows well on a range of surfaces including rock, sand and mud.
- Tolerates a wide variety of water temperatures.
- Infestations can occur if aquariums are emptied into the sea, drains or other waterways.

What looks similar to it?

Caulerpa taxifolia



Caulerpa articulata

NOT *Caulerpa taxifolia*

If you think you have seen this weed:

- DO NOT attempt to pick it or remove it – tiny fragments can re-grow into new plants.
- Contact MPI immediately on **0800 80 99 66**.

POTOMOCORBULA AMNURENSIS ASIAN CLAM

MARINE PEST GUIDE

Identifying features

- Has a very visible overbite – i.e. the two shell halves are different in size and shape.
- Dirty white, yellow or tan in colour.
- 2-3 cm across.

The threat

Asian clams can live in fresh and salt water. Because they consume large amounts of phyto and zooplankton, they can substantially change any marine community.

Think you've seen this clam? Call MPI free on 0800 80 99 66

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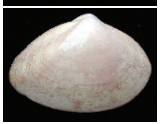
Where is the Asian clam found?

- Occurs in estuaries and brackish waters.
- Gathers in mud, sand, peat and clay surfaces.
- Grows subtidally, buried in large clumps with some of the shell exposed above the sediment.

What looks similar to it?

Many New Zealand native bivalves look similar, BUT the only native species with different-sized shells does not live in the same habitat (see above).

Corbula zelandica
Basket shell
Has overbite, but found on sandy shores and harbours – not estuaries.



Maorimactra ordinaria
Surf clam
No overbite and found on open coasts.

Mactra tristis
Surf clam
Found in estuaries and river mouths BUT no overbite and bigger than the Asian clam.

If you think you have seen this clam:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

SABELLA SPALLANZANII MEDITERRANEAN FANWORM

MARINE PEST GUIDE

Identifying features

- A single spiral fan.
- Fan is white, banded brown/orange.
- The tube is tough and flexible and orange-coloured, although often muddy in appearance.
- Up to 40 cm tall.
- Fans stick out from 1–6.5 cm when feeding.

The threat

The Mediterranean fanworm can form dense groups that could compete with native species for food and space. Recent studies indicate some impact on the establishment of new generations of some species, and on nutrient flow. Dense beds could become a nuisance to recreational and commercial fishers through the clogging of dredges and fouling of fishing gear.

If you've seen this fanworm outside of Lyttelton or Auckland, call MPI free on 0800 80 99 66.

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Where is the Mediterranean fanworm found?

- Typically in estuaries or sheltered sites.
- At a depth of between one and 30 metres.
- Anchored to a hard surface.

What looks similar to it?

Many New Zealand native fanworms look similar. BUT the Mediterranean fanworm is larger than all native fanworms, and has other distinctive features.

A worm with two spiral fans is NOT Mediterranean fanworm

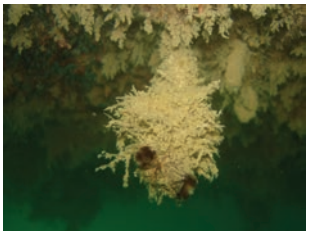
A worm with two semi-circular fans is NOT Mediterranean fanworm

A worm with a hard tube is NOT Mediterranean fanworm

If you think you have seen this fanworm outside Lyttelton, Auckland or Northland:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

STYELA CLAVA SEA SQUIRT



Styela clava in mussel farm scrap sack. *Styela* circled.

Identifying features

- A tubular club-shaped body tapering to a stalk.
- Tough leathery skin.
- Coloured brownish white, yellow-brown or reddish-brown
- Frequently appears “fuzzy” with a covering of other fouling debris.
- Two short siphons or openings visible on end of individuals when underwater.
- Grows up to 16cm long.

The threat

Styela clava threatens New Zealand’s aquaculture industry, with its ability to blanket mussel lines and compete for food. It also poses a potential threat to native marine ecosystems.

If you think you’ve seen this sea squirt outside of the Hauraki Gulf, Lyttleton, Northland, Nelson or Porirua Harbour call MPI on 0800 80 99 66.

Styela clava.

Pyura pachydermatina.

Where is *Styela clava* found?

- *Styela clava* likes to settle on hard surfaces, particularly man-made structures – e.g. boat hulls, wharves, aquaculture structures, mussel lines.
- Surfaces without antifouling paint.
- Sometimes on rocks, seaweed and shellfish.
- Likes sheltered areas away from wave action.

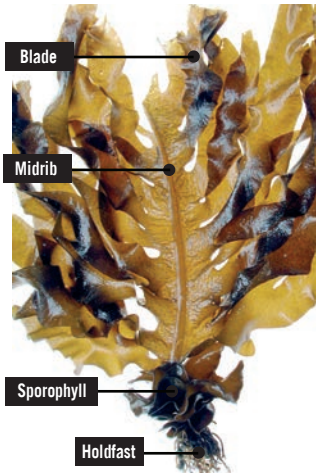
What looks similar to it?

The native sea tulip *Pyura pachydermatina* is a similar stalked organism, BUT its stalk is much longer and it is often a white/purple-red in colour.

If you think you have seen *Styela clava* sea squirt outside of Hauraki Gulf, Lyttleton, Picton, Nelson or Porirua Harbour:

- Note the location carefully.
- If possible, collect a sample and freeze in a plastic bag.
- Contact MPI immediately on **0800 80 99 66**.

UNDARIA PINNATIFIDA JAPANESE KELP



Identifying features

- Brownish/green-yellow seaweed.
- Distinctive spiral sporophyll near the base of the plant where the leaf (blade) joins the holdfast or roots/base.
- One to two metres long blades with obvious midrib.

The threat

Undaria is a fast-growing seaweed that can smother native species. It poses a particular threat to the unique marine environment in Fiordland. It is, however, widespread in ports and harbours along New Zealand's east coast.

Help us protect Fiordland

If you think you have seen undaria in the Fiordland Marine Area (and only in Fiordland) please immediately phone Ministry for Primary Industries on: **0800 80 99 66**

Think you've seen this kelp? Call MPI free on 0800 80 99 66

Where is it found?

- Intertidal to subtidal zones to a depth of around 15 metres.
- On any hard surface, including reefs, ropes, wharf piles, vessel hulls, moorings and other artificial structures.
- Forms dense forests in sheltered reef areas.

What looks similar to it?

The New Zealand kelp *Ecklonia radiata* BUT Ecklonia has no midrib or sporophyll.

Ecklonia

- No midrib
- No sporophyll

Undaria

- Midrib
- Sporophyll

If you believe you have seen undaria in the waters of Fiordland, please phone Ministry for Primary Industries on: **0800 80 99 66**