

Marine invasive non-native species in Northern Ireland



Introduction

Invasive non-native species can have a negative impact on habitats and out compete native species. Introduced non-native species have a tendency to spread in environments where they are not native due to the absence of natural predators or grazers. In some cases they can drastically alter the habitat e.g. on the mainland coasts of Europe and also on the south coast of England, the Pacific oyster has replaced many of the native, rocky shore seaweeds, in some places forming dense aggregations of 700 individuals/m². Marine invasives can also have serious economic impacts by competing with or replacing our native biodiversity and also by fouling structures such as marina pontoons, boat hulls, fishing gear, aquaculture ropes and enclosures and slipways.

It is important to note that not all non-native species are invasive and several of the species reported from Northern Ireland have so far, not had a significant effect on our local species and habitats. In Northern Ireland the Pacific oyster has now been reported at several sites but only in low numbers. However, as sea temperatures increase as a consequence of climate change it will be important to monitor the spread of this species and others like it.

Early detection of marine invasives is crucial to try and contain or control their spread. The aim of this guide is to provide an identification resource that can be used by anyone exploring the marine environment e.g. fishermen, sailors, snorkelers, divers, walkers, etc. to report sightings of potential invasives. For guidelines on how to avoid spreading invasive non-native species through your own marine leisure activities visit the Check Clean Dry website: invasivespeciesireland.com/what-can-i-do/check-clean-dry

Further reading: Minchin, D.M and Nunn, J.D. (2013) Rapid assessment of marinas for invasive alien species in Northern Ireland. Northern Ireland Environment Agency Research and Development Series No. 13/06 available at: invasivespeciesireland.com/wp-content/uploads/2017/01/marina_report_final.pdf

Reporting

- Please submit invasive species records with an accompanying date and location to CEDaR Online Recording: www2.habitas.org.uk/records/home
- Include a photograph to assist with species verification
- An assigned verifier will review your record on submission. All confirmed records will be collated on CEDaR's database and will appear on the NBN Atlas Northern Ireland: northernireland.nbnatlas.org
- Alternatively you can submit records using the iRecord App. Contribute your species sightings with GPS acquired coordinates, descriptions and other information: irecord.org.uk/app

Funding: Department of Agriculture, Environment and Rural Affairs (DAERA)

Author: Christine Morrow

Photography: Bernard Picton, Christine Morrow, David Fenwick, John Bishop (Marine Biological Association) and Mick Otten

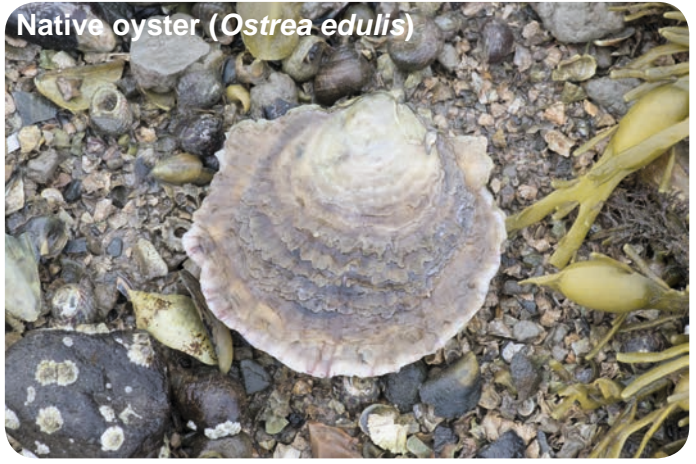
Data: Centre for Environmental Data and Recording (CEDaR)

Contributors: CEDaR, DAERA Marine and Fisheries Division, Christine Maggs (Joint Nature Conservancy Council), John Bishop (Marine Biological Association)

Contracting officer: Sally Stewart-Moore (CEDaR)

Citation: Morrow, C.C., 2020. Marine invasive species in Northern Ireland. CEDaR, National Museums Northern Ireland, Belfast, January 2020.

Pacific oyster (*Magallana gigas*)



- The Pacific oyster (top left) can grow to 18 cm in length.
- The Pacific oyster can be distinguished from the native oyster (top right) by the shape of the shell. The native oyster has a roundish outline whilst the Pacific oyster is elongate and oval.
- There are 6 to 7 distinct ribs on the lower shell and ridges on top shell match those of bottom shell.
- Shell is off-white to brownish, sometimes with purplish streaks.
- Previously called *Crassostrea gigas*.

Habitat: Found on the lower shore and shallow sublittoral to a maximum depth of 80 m.

Establishment: Now established in the wild from stocks cultivated in Strangford Lough, Carlingford Lough and Lough Foyle.

Slipper limpet (*Crepidula fornicata*)

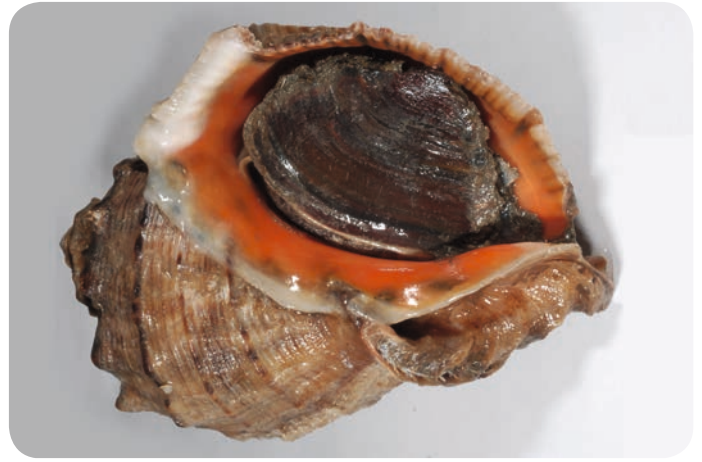


- The slipper limpet can grow to 5 cm in length.
- The shell is oval in shape with a small spire towards the back.
- The outside of the shell is smooth with pinkish red streaks.
- The underside of the shell is creamish-white with a characteristic 'shelf' (top right).
- Individuals are commonly found stacked on top of each other.
- Records should state whether it is just the shell or if it is alive and the animal is still inside.

Habitat: It lives on shells and stones in the shallow subtidal, often associated with mussel and oyster beds.

Establishment: First reported in NI in 2009 from Belfast Lough, the first record from Lough Foyle was in 2018.

Veined rapa whelk (*Rapana venosa*)



- The shell can be up to 17 cm long but is typically 14 cm.
- Knobbly, thick and rounded shell with a short spire.
- The shell is grey to reddish-brown on the outside with darker brown streaks and bright orange red on the inside.
- Aperture of shell is very large and there is a row of small teeth along one side and a short siphonal groove.

Habitat: Usually found in estuaries at depths between 4–20 m where it feeds on other molluscs including mussels, cockles and farmed oysters.

Establishment: First invasive population reported from the Black Sea in 1947. No confirmed records for UK or Ireland.

Left image: (CC-BY-SA-2.0) flickr photo by Katya <https://flic.kr/p/AYnbnD>. Right image: (CC-BY-2.0) flickr photo by Smithsonian Environmental Research Center <https://flic.kr/p/LZfaQm>

Orange-striped anemone (*Diadumene lineata*)



- This is a tiny sea anemone, up to 1 to 2 cm in diameter.
- The column (base) is olive green with diagnostic orange vertical stripes.
- The top left photo shows the tentacles extended. They are usually translucent white or greyish and contrast with the green column.
- In Northern Ireland this species is only known from Strangford Lough and Carlingford Lough.
- Previously called *Haliplanella lineata*.

Habitat: Found on shallow subtidal mixed sediment with shell and beneath boulders on the low shore. Elsewhere in the UK it has been found in sheltered bays and harbours and also in brackish waters.

Establishment: First reported in NI in 2010 from Strangford Lough.

Carpet sea squirt (*Didemnum vexillum*)



- A colonial sea squirt.
 - Forms thin peelable sheets 2 to 5 mm thick.
 - The colour is uniform cream to dull orange.
 - The internal water channels appear as dark veins.
 - A white patch surrounds the inhalant openings.
 - Forms large, leathery patches.
 - On overhanging substrata e.g. boats and buoys, it can form long, hanging formations up to 1 m in length. These can break away and attach elsewhere.
- Habitat:** Grows on artificial substrata e.g. boats, buoys, pontoons and also seaweeds, rocks and boulders. Usually found in sheltered areas from the low shore to 65 m.
- Establishment:** First reported from NI in 2015 from Strangford Lough.

Orange cloak sea squirt (*Botrylloides violaceus*)



- A colonial sea squirt.
 - Forms flat sheets up to 3 mm thick.
 - The colony has an irregular outline.
 - Uniform colour which can be orange, yellow, red, brown or purple.
 - The colony consists of small individuals (zooids) arranged in twisting double rows (top left).
 - Large orange-red larvae are sometimes visible in the jelly-like matrix.
- Habitat:** Grows on artificial substrata e.g. boats, buoys, pontoons and also seaweeds, mussels and other sea squirts. Usually found in sheltered areas from the low shore to 10 m.
- Establishment:** First reported from NI in 2011 from Bangor Marina.

Leathery sea squirt (*Styela clava*)



- A solitary sea squirt.
- Grows to 12 cm in length.
- Leathery, warty body with a tough slender stalk (top right).
- Two, close together siphons on top of body.
- Siphons have conspicuous cream and purplish stripes on inside.
- The long, slender stalk is diagnostic, not likely to be confused with any other species.

Habitat: Found in the shallow subtidal down to 25m. Most records are from marinas and harbours but also occurs in sheltered bays.

Establishment: First reported from NI in 2009 from Larne Lough.

Compass sea squirt (*Asterocarpa humilis*)



- A clump forming solitary sea squirt.
- Can grow to 3 cm in length.
- Orange-red colour.
- Bulbous shape to body.
- 2 fluted siphons
- Conspicuous white markings on inside of siphons resemble the points of a compass. These compass-like markings are diagnostic.

Habitat: Usually found in harbours and marinas where it fouls ships' hulls, pontoons and buoys.

Establishment: First reported from NI in 2018 from Strangford Lough.

Glassy sea squirt (*Aplidium* cf. *glabrum*)



- This invasive colonial sea squirt is not the same as *Aplidium glabrum*, hence the use of cf. (= similar to).
- Should be recorded as *Aplidium* cf. *glabrum*.
- The glassy appearance is diagnostic.
- Forms thick cushions approximately 1 cm thick.
- Variable in size but patches are typically 4 to 8 cm across.
- Shiny grey colour.
- Individual zooids are visible as white spots through a semi-transparent matrix.

Habitat: Often on artificial substrata in marinas and harbours but also beneath boulders on the low shore in sheltered, silty areas.

Establishment: First found in the Netherlands in 1977, first reported from NI in 2015.

Orange-tipped sea squirt (*Corella eumyota*)



- Solitary sea squirt.
- Usually 2 to 4 cm in length.
- Smooth, semi-transparent body, off-white to pale orange in colour.
- 2 short siphons, one on the top of the body and one on the side.
- Conspicuous and diagnostic orange pigment around siphons (top right).
- C-shaped gut running along edge of body is visible.

Habitat: Often on artificial substrata in marinas and harbours but also beneath boulders and stones on the low shore in sheltered areas.

Establishment: First reported from NI in 2006 from Carrickfergus Marina.

Creeping sea squirt (*Perophora japonica*)



- Individual zooids are connected by a creeping, bright yellow stolon.
- Forms tight clusters of tiny, translucent yellow zooids.
- Each zooid is approximately 4 mm in length.
- Yellow star-shaped buds on the stolon are characteristic (top right).

Habitat: Found on artificial substrata in marinas and harbours but also beneath boulders and stones on the low shore in sheltered, silty areas.

Establishment: First reported from NI in 2015 from Strangford Lough and Carlingford Marina.



Red ripple bryozoan (*Watersipora subatra*)



© David Fenwick



© David Fenwick

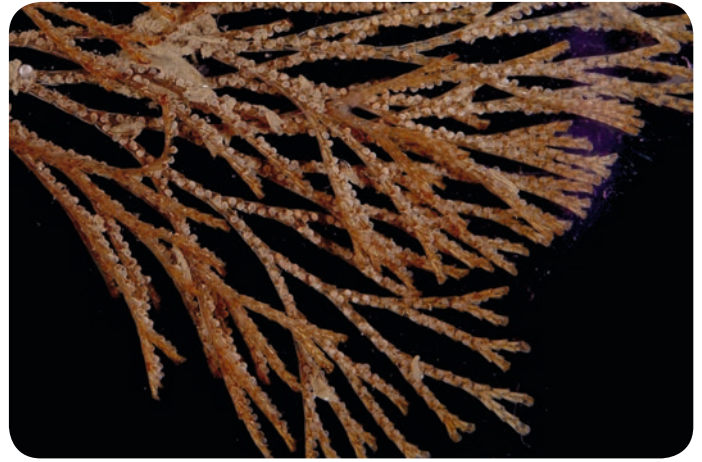
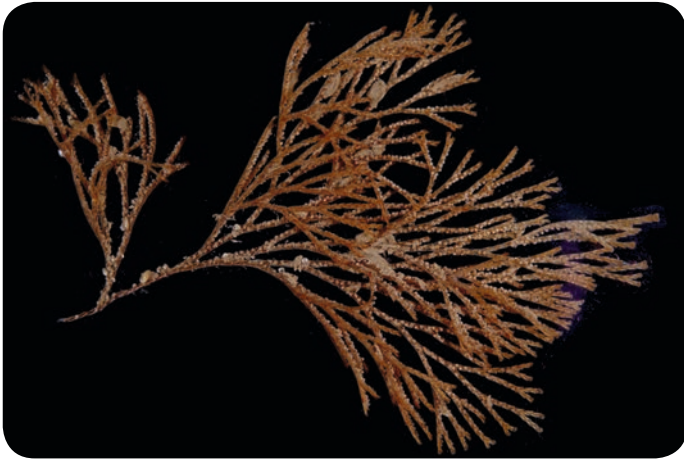
- This is a bryozoan (also known as sea mats), a colonial animal, made up of many individuals called zooids.
- Grows as a crustose colony on hard substrata.
- The shape of the colony varies with age and shelter.
- Young colonies form flat, roundish patches several centimetres across.
- As the colony grows the outer margins become curled or rippled.
- Older colonies can grow into rose-shaped formations.
- Usually bright orange-red in colour, sometimes the central part of the colony (the older part) is black.

Habitat: Found on artificial substrata in marinas and harbours but is also known to occur on rocks and shells in shallow water.

Establishment: First reported from NI in 2015 from Ardglass Marina.

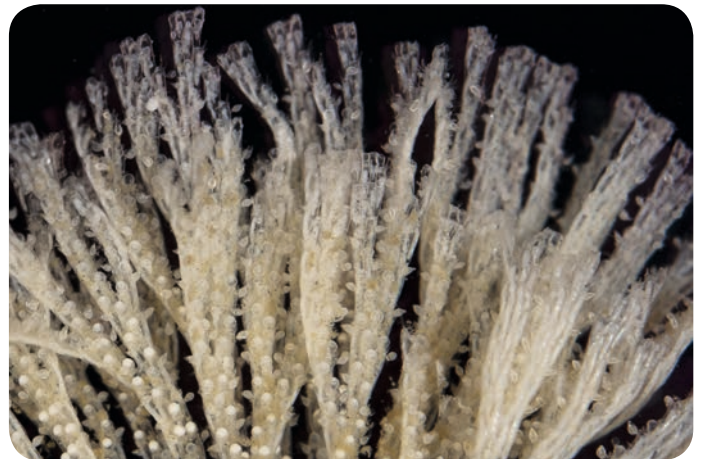


Brown bryozoan (*Bugula neritina*)



- This is a bryozoan (also known as sea mats), a colonial animal, made up of many individuals called zooids.
 - Grows as an erect, dichotomously branching colony.
 - Grows to approximately 8 cm in length.
 - Distinctive purplish-brown colour.
 - The branches have zooids arranged in double rows with zooids alternating side to side.
 - The embryos when present are paler brown.
 - Attaches to substratum by a holdfast.
- Habitat:** Found on kelp and artificial substrata in marinas and harbours.
- Establishment:** First reported from NI in 2013 from Carrickfergus Marina.

Bryozoan (*Bugulina fulva*)



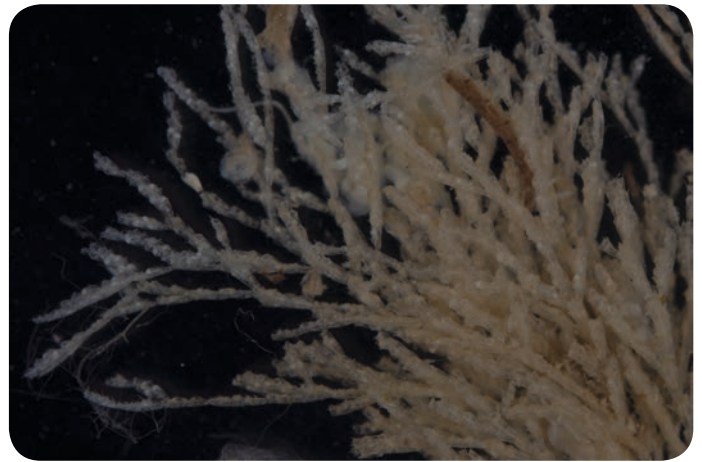
- This is a bryozoan (also known as sea mats), a colonial animal, made up of many individuals called zooids.
 - An erect bryozoan which forms dense, tufted colonies.
 - Colonies are up to 3 cm tall.
 - Pale yellowish-brown in colour.
 - Difficult to separate from *Bugulina simplex* without a microscope, if in doubt specimens can be recorded as *Bugulina fulva/simplex*.
 - The branches have zooids arranged in rows of 2 zooids wide increasing to 4 just below each branching point, whereas *Bugulina simplex* has 5–6 zooids below each branching point.
- Habitat:** On artificial substrata in harbours and marinas.
- Establishment:** First reported from NI in 2012 from Strangford Lough.

Bryozoan (*Bugulina simplex*)



- This is a bryozoan (also known as sea mats), a colonial animal, made up of many individuals called zooids.
 - This is an erect bryozoan which forms thick tufts.
 - Up to 3 cm tall.
 - Branches dichotomously.
 - Branch segments are narrow at the base, becoming broader at the top.
 - Difficult to separate from *Bugulina fulva* without a microscope, if in doubt specimens can be recorded as *Bugulina fulva/simplex*.
 - The branches have zooids arranged in multiple rows with 5 or 6 across just below each branching point, *Bugulina fulva* has 2–4.
- Habitat:** Found on artificial substrata in marinas and harbours.
- Establishment:** First reported in 2011 from Bangor Marina.

Bryozoan (*Tricellaria inopinata*)



- This is a bryozoan (also known as sea mats), a colonial animal, made up of many individuals called zooids.
 - An erect bryozoan.
 - Forms bushy irregular tufts.
 - Cream to buff in colour.
 - Branches thin, composed of alternating zooids and branching alternately.
- Habitat:** Found on artificial substrata in marinas and harbours.
- Establishment:** First reported in 2011 from Bangor Marina and Portrush Harbour.

Chinese mitten crab (*Eriocheir sinensis*)



- A large crab, the shell is typically 8 cm across.
- The most characteristic feature are the hairy claws, hence the name 'mitten crab'.
- Variable in colour from greenish brown to orange-brown.
- When extended the legs are twice the length of the body.
- **Habitat:** Juveniles start life in the marine environment and estuaries then move upstream into brackish and freshwater habitats where they burrow into muddy riverbanks. There is a risk of damage to riverbanks associated with burrowing activity.
- **Establishment:** As yet there are no records from Northern Ireland, but occurs in many sites across England, Wales and now, Scotland.

Asian shore crab (*Hemigrapsus sanguineus*)



- The shell can be up to 4.2 cm across.
- The edge of the shell between the eyes is smooth in contrast to our native shore crab (*Carcinus maenas*), which has 3 rounded lobes between the eyes.
- There are 3 serrated teeth either side of the eyes (top left), whereas in our native shore crab there are 5.
- The body is mottled greenish-brown.
- The legs are striped.
- The front claws have reddish spots on the upper surface.
- **Habitat:** Found on the low shore and shallow subtidal on natural and artificial substrata in sheltered areas.
- **Establishment:** First reported from the south east coast of England in 2015.

Brush-clawed shore crab (*Hemigrapsus takanoi*)

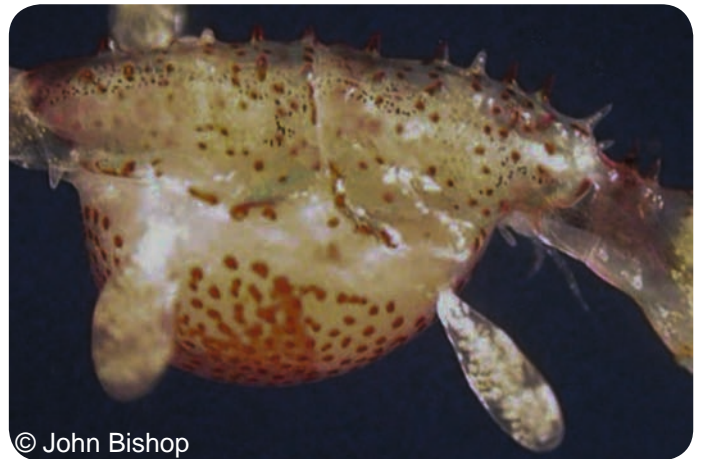


- The shell can be up to 2.5 cm across.
- The edge of the shell between the eyes is smooth in contrast to our native shore crab (*Carcinus maenas*), which has 3 rounded lobes between the eyes.
- There are 3 serrated teeth either side of the eyes, whereas in our native shore crab there are 5.
- The body is mottled brown.
- Males have a diagnostic patch of brown bristles on their claws.
- The legs have small dark spots.

Habitat: Found on the low shore and shallow subtidal on natural and artificial substrata in sheltered areas.

Establishment: First reported from the south east coast of England in 2015.

Japanese skeleton shrimp (*Caprella mutica*)



© John Bishop



- Skeleton shrimps (caprellids) all have slender, thread-like bodies and 2 pairs of antennae on the head.
- This is a relatively large species, males are up to 3.5 cm long whilst females only grow to 1.5 cm.
- Distinctive bright orange-red colour.
- In males the first two body segments are hairy and the first pair of antennae are more than half the body length.
- The antennae have distinctive yellow and red bands.
- A red-spotted brood pouch on the belly of females is diagnostic (top right).

Habitat: Attached to seaweeds and sessile animals, especially in marinas and harbours.

Establishment: First record from NI was in 2006 from Bangor Marina.

Beaked barnacle (*Austrominius modestus*)

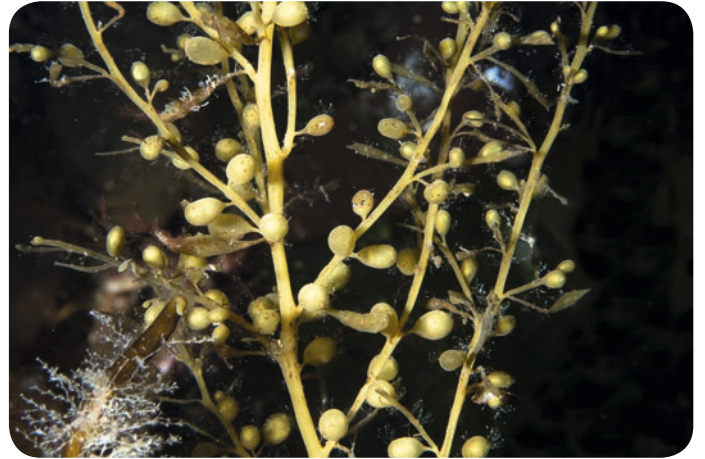


- Formerly known as *Elminius modestus*.
- Barnacles are crustaceans; although they live attached to rocks they are relatives of crabs and lobsters.
- This is a small barnacle 5 to 10 mm across.
- The 4 shell plates are diagnostic for this species (our native barnacles all have 6 plates).
- It has a diamond-shaped aperture.
- This species is fast growing and can tolerate a range of salinities and temperatures.
- Competes with our native acorn barnacle (*Semibalanus balanoides*).

Habitat: Occurs in a wide range of intertidal habitats on rocks and shells and fouling other organisms. Top right photo shows it fouling mussels.

Establishment: First reported in Britain in 1946.

Japanese wireweed (*Sargassum muticum*)



- Large brown seaweed, grows to over 2 m in length.
- Yellowish-brown to dark brown in colour
- Small spherical air bladders on stalks and flattened oval blades are diagnostic (top right).
- Regular, alternate branching.
- Tough and cartilaginous.
- Very fast growing, can out compete native seaweeds.

Habitat: Intertidal rock pools and on rock in the shallow subtidal. Occurs in estuarine conditions as well as on the open coast.

Establishment: First reported in NI in 1995 from Strangford Lough. It is now widespread on all coasts.

Oyster thief (*Colpomenia peregrina*)



- A brown seaweed, usually 3 to 7 cm across.
- Olive-brown in colour.
- Thin-walled hollow sphere (top left), older specimens become furrowed (top right).
- Tears easily.
- Dry, papery texture.
- Named the *Oyster thief* as specimens attached to oyster shells can float away with the oyster attached.
- Could be confused with the Punctured ball weed (*Leathesia difformis*) however this species is a gelatinous ball, not thin walled and papery.

Habitat: Usually grows on other seaweeds as well as shells. Found in intertidal rock pools and the shallow subtidal.

Establishment: First introduced to Europe in 1906.

Wakame (*Undaria pinnatifida*)



- A large, dark brown seaweed, 1 to 3 m in length.
- Broad, flat frond, divided into finger-like projections.
- Flat, broad midrib is diagnostic.
- In older plants the flattened stipe has a wavy-curved margin similar to the native Furbellows (*Saccorhiza polyschides*).
- Flattened stipe with corrugated edge is also diagnostic.
- Claw-like holdfast.

Habitat: On artificial substrata in marinas and harbours.

Establishment: First reported in NI in 2015 from Carrickfergus Marina.

Devil's tongue weed (*Grateloupia turuturu*)



- A dark red seaweed, can grow to 1 m in length.
- Lance shaped blade with wavy margin up to 20 cm across.
- Smaller, blades can proliferate from main blade.
- Short stipe (top right).
- Small, disc-like holdfast is diagnostic (top right).
- Smooth, slippery texture.

Habitat: Lives on shells and stones in the shallow subtidal but is occasionally found on the low shore rock pools and on artificial substrata in marinas and harbours. Can tolerate low salinity.

Establishment: First reported in NI in 2017 from Carrickfergus Marina.

Harpoon weed (*Asparagopsis armata*)



© John Bishop



- Pinkish-red seaweed up to 30 cm long.
- Erect, fluffy branches.
- Branches alternate and spiralled.
- Soft texture.
- Some branches with conspicuous barbed harpoon-like structures (top right), these are diagnostic.

Habitat: Found on low shore and shallow subtidal, in sheltered or moderately exposed areas.

Establishment: First reported from NI in 2012 from Rathlin Island as drift.

Siphoned Japanese weed (*Dasysiphonia japonica*)



© David Fenwick

- Dark red seaweed up to 60 cm long.
- Untidy, bushy appearance (top left).
- Disc-like holdfast.
- One or more main stems, each stem divides irregularly.
- Could be confused with other finely branched red seaweeds. Specimens should be spread out against a white background and photographed for identification to be confirmed.

Habitat: Found on sand covered rock on the low shore.

Establishment: First reported in NI in 2011 from Strangford Lough.



Bonnemaison's hook weed (*Bonnemaisonia hamifera*)



© David Fenwick



© David Fenwick

- Bright to dark red seaweed up to 20 cm long.
- Red feathery, densely branched fronds.
- Soft delicate texture.
- Hook-like branches (top right) are diagnostic.
- Uses 'hooks' to attach to other seaweeds.

Habitat: Found in low shore rock pools and the shallow subtidal attached to other seaweeds.

Establishment: First reported from the south coast of Britain in 1893.



