



## Invasive Non-Native Species Watchlist




### 1. Introduction


This document identifies the main invasive non-native species (INNS) of relevance to the inshore waters and estuaries of the area between the River Tyne in England and Fast Castle Head in Scotland.

Species are given in three lists:

- **The Red-List** identifies INNS which are currently thought to be present in our area and which have the potential to impact on native species and/or important marine habitats
- **The Amber-List** identifies INNS which are currently thought to be present in our area but which are considered to pose a lower risk to native species and/or important habitats
- **The Black-List** identifies species are not currently thought to be present but which may colonise in the coming years

### 2. Red-List Species

Species	Distribution	
Pacific oyster <i>Magallana gigas</i>	Farmed at several locations around UK coasts and estuaries. Escapees have established populations in several locations. Recorded on Firth of Forth in 2013. <i>M. gigas</i> is farmed commercially on Fenham Flats in Northumberland, although there is no evidence of spread into the wider marine environment from this operation	 <p>Photo: Paul Brazier – CCW Crown Copyright</p>
Chinese mitten crab <i>Eriocheir sinensis</i>	Common in the River Thames and River Medway with isolated records elsewhere. Recorded from the River Tyne in 2017.	 <p>Photo: GBNNS Crown Copyright</p>
Darwin's barnacle <i>Austrominius modestus</i>	Distributed around most English and Welsh coasts. Recorded at a number of locations on the Berwickshire and Northumberland coast	 <p>Photo: Paul Brazier – CCW Crown copyright</p>

Species	Distribution	
Japanese skeleton shrimp <i>Caprella mutica</i>	Recorded from southern and south west England, the west coast of Scotland and the Western Isles. Possibly recorded on the north shore of Holy Island in 2012 but unconfirmed.	 <p>Photo: © Hans Hillewaert CC BY-SA 4.0</p>

## Pacific oyster *Magallana gigas*

### **Description and impact**

Variable and irregular in appearance. Off-white to yellow or bluish grey in colour, often with deep purple patches. Grows up to 30 cm in length with a teardrop shape and rough shell. The right valve is deeply cupped with six or seven bold ribs; the left valve is flat or slightly convex. Once established the Pacific oyster may out-compete and displace native species. It also has the potential to smother or exclude other marine life (including reef-building species) and alter habitat type. *M.gigas* is seen to outcompete both the native oyster (*O.edulis*) and the blue mussel (*M.edulis*), and has been found to reduce suitable habitat for cockles.

### **Habitat**

Lives permanently attached to any hard substrate in intertidal and shallow subtidal zones of estuaries and coastal waters. In muddy or sandy areas Pacific oysters will settle on small rocks, shells or other oysters and can create reefs by cementing their shells to each other, forming dense layers.

### **How is it spread?**

Feral populations escaped from aquaculture

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1013>

## Chinese mitten crab *Eriocheir sinensis*

### **Description and impact**

A large crab with a maximum carapace (body) length of 56 mm. The carapace is quite square in outline, narrowing towards the front and has four teeth on each side. Olive green in colour with paler legs, which are twice the length of the body. The most obvious distinguishing feature of the Chinese mitten crab is the dense mat of hair on the claws. The leading edges of the legs are also very hairy. Can impact marine and freshwater ecosystems. A voracious predator that will consume a range of invertebrate species and the eggs of fish leading to competition with native species and impacting invertebrate and fish populations. Will burrow into river banks, increasing erosion and river turbidity, and causing bank collapse. Burrowing will also lead to the siltation of gravel beds, including those used for fish spawning.

### **Habitat**

Early stages are found in lower estuarine areas with saline conditions. Adults are usually found in fresh or brackish waters in rivers. Muddy banks are required to provide habitat to burrow into for protection. Although aquatic vegetation in shallow, open waters such as marshes can provide an alternative refuge to burrowing. Adult females are often found in saltwater, particularly deep, open waters in bays.

### **How is it spread?**

The main vector for the introduction into UK is via ships' ballast water

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1379>

## Darwin's barnacle *Austrominius modestus*

### **Description and impact**

A small sessile barnacle, 5 -10 mm in diameter, characterised by having four shell plates. Low, conical body shape with a diamond shaped opening. Young specimens are white and smooth; adults are grayish brown and usually eroded. Can dominate hard surfaces and outcompete native species; this species has largely displaced native barnacles in estuaries in southwest GB although impacts are less significant on exposed rocky shores. In favourable conditions it can be a nuisance as a fouling organism.

### **Habitat**

Can inhabit almost the entire intertidal zone but is most common from mid-shore to shallow subtidal areas of estuarine and sheltered marine habitats. It attaches to a variety of substrates including rocks, stones, hard-shelled animals and artificial structures including ships, and tolerates a wide range of temperature and salinity.

### **How is it spread?**

Larvae are planktonic for up to a month and during this time may be transported by water currents or in ships' ballast water. Further dispersal of settled individuals may occur through attachment to other organisms or artificial substrata including ships' hulls. This is a fast-growing species that is quick to reach maturity, which combined with its high reproductive output gives it a competitive advantage over slower growing, less fecund native species.

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1301>

## Japanese skeleton shrimp *Caprella mutica*

### **Description and impact**

A large skeleton shrimp up to 49 mm in length; males are larger than females. There are fine hairs on the first two body segments, large spines on third to seventh body segments in males and orange spots on the females' brood pouch. An aggressive species, the Japanese skeleton shrimp may outcompete native skeleton shrimps for food and space, even at low densities. On the west coast of Scotland, their abundance can reach 300,000 individuals m<sup>-2</sup>. Research suggests the potential for significant impacts on benthic communities.

### **Habitat**

Tends to be found in areas of human activity on natural and artificial substrata including hydroids, macro-algae, mooring ropes and buoys, but has yet to be found in natural habitats.




### **How is it spread?**

The species has limited dispersal ability and introductions are associated with human activity (such as attachment to hull fouling, transport of ballast water, nets or buoys) or with floating algae.

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=647>

### 3. Amber list species

Species	Distribution	
Green sea fingers <i>Codium fragile</i>	Distributed around the UK coast. Local records from Beadnell, Bamburgh, Whitley Bay and Petticowick.	 <p>Photo: Niall Moore</p>
Orange-tipped sea squirt <i>Corella eumyota</i>	Recorded from Oban (Scotland) around south coast of England and to Lowestoft by 2009 and spreading rapidly. Recorded at Cresswell and at Holy Island.	 <p>Photo: Berwickshire and Northumberland Marine Nature Partnership</p>
Oyster Thief <i>Colpomenia peregrina</i>	Occurs around most British coasts, with larger populations on western coasts and limited records from the east coast of England. Existing records from Northumberland, including Cullercoats and Lindisfarne.	 <p>Photo: Berwickshire and Northumberland Marine Nature Partnership</p>

#### Green sea fingers *Codium fragile*

##### **Description and impact**

A spongy green seaweed with numerous Y-shaped, branching, cylindrical fronds; may reach 70 cm high but in Britain usually to 25 cm. The fronds have a felt-like texture and a disc-shaped holdfast formed from many fine filaments. May cause a nuisance to humans when it accumulates and rots on beaches, producing a foul smell. Where it occurs in high densities, green sea fingers can be a fouling nuisance to shellfish beds, smothering mussels and scallops, clogging scallop dredges and interfering with harvesting. Currently it is not thought to be causing problems at its localities in Berwickshire and Northumberland.

##### **Habitat**

Occurs on rock and coralline algae in pools and on open rock from the mid to lower shore, and in shallow subtidal waters. On sandy or muddy bottoms, it attaches to bivalve shells, rocks or artificial structures. It mainly inhabits protected bays and estuaries but also occurs on semi-exposed shores.

##### **How is it spread?**

Spreads by vegetative buds, fragments of the thallus and entire dislodged thalli, all of which are dispersed by surface currents. Also releases weakly swimming 'swarmer' cells toward the end of the growing season. These propagules exhibit varying retention rates in the water column, enabling both short and long-distance dispersal. Transport also occurs through fouling of ships' hulls, fishing nets and aquaculture products and equipment.

##### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=866>

## Orange-tipped sea squirt *Corella eumyota*

### **Description and impact**

A non-colonial sea squirt up to eight cm length. Lays flat, with exhalant siphon slightly to the right. Siphons often have orange tinge. Tunic is translucent, smooth. Gut forms smooth curve around hind end. Individually small but may form dense clumps by settlement of larvae onto older individuals. Clumps could clog pipes or render submerged gear (e.g. in aquaculture) cumbersome. Potential competitor for food and space with cultured bivalves.

### **Habitat**

Mainly marinas and harbours, but capable of colonising natural habitats, e.g. shores in Plymouth Sound and the Yealm Estuary, Devon. Also occurs sub-tidally in native range, and likely to do so here.

### **How is it spread?**

Natural dispersal apparently very limited; sessile as adult, non-feeding swimming larvae brooded and released when ready to settle. Occasional rafting of adults on weed etc. possible. Spread along coast in Europe probably substantially assisted by leisure craft (hull fouling), with populations in a high proportion of marinas within current introduced range

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=902>

## Oyster Thief *Colpomenia peregrina*

### **Description and impact**

Algae. Young are brown and balloon-like, becoming yellow-brown, contorted and collapsed with age. The frond is papery and delicate; it is filled with seawater when young and hollow and empty when older. Thalli are hollow, becoming air-filled and buoyant; this enables them to spread by floating on surface currents. Gametes released by the plant are dispersed in the water column before settling. Negligible effects on the environment. Potential nuisance for aquaculture but no economic impacts recorded in recent times

### **Habitat**

Found on rock, other seaweeds or shells, including commercially grown oysters, from early summer to late autumn. The oyster thief is usually epiphytic, growing on a variety of seaweeds in mid to lower shore rock pools and in the shallow subtidal region. It thrives in sheltered areas. Found on rock, other seaweeds or shells, including commercially grown oysters, from early summer to late autumn. The oyster thief is usually epiphytic, growing on a variety of seaweeds in mid to lower shore rock pools and in the shallow subtidal region. It thrives in sheltered areas








### **How is it spread?**

The oyster thief was introduced to France from the USA with imports of oysters at the end of the nineteenth century. Natural spread from France to Britain has since occurred; it may also have been unintentionally introduced with commercial oyster imports. Thalli are hollow, becoming air-filled and buoyant; this enables them to spread by floating on surface currents. Gametes released by the plant are dispersed in the water column before settling.

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=877>

#### 4. Black-list species

Species	
Slipper limpet <i>Crepidula fornicata</i>	 <p>Photo: Paul Brazier – CCW Crown Copyright</p>
Wakame <i>Undaria pinnatifida</i>	 <p>Photo: Kathryn Birch - CCW Crown Copyright</p>
Carpet sea squirt <i>Didemnum vexillum</i>	 <p>Photo: CCW Crown Copyright</p>
Harpoon weed <i>Asparagopsis armata</i>	 <p>Photo: Kathryn Birch – CCW Crown Copyright</p>
Wireweed <i>Sargassum muticum</i>	 <p>Photo: GBNNS Crown Copyright</p>
Orange-striped anemone <i>Haliplanella lineata</i>	 <p>Photo: <a href="#">keisotyo</a>, CC BY-SA 4.0</p>
Leathery sea squirt <i>Styela clava</i>	 <p>Photo: Chris Wood, Marine Conservation Society</p>

## Species

American Lobster *Homarus americanus*



Photo: [Derek Keats, CC BY 2.0](#)

## Slipper limpet *Crepidula fornicata*

### **Description and impact**

Shell is oval and up to 5 cm in length. The large shell opening has a shelf, extending half its length. Shell is smooth and white, cream, yellow or pinkish in colour with streaks or blotches of red or brown. Commonly found in curved chains or stacks made up of several individuals. Can smother seabed species and alter seabed habitat structure dramatically. Competes for food and space with other filter-feeding species including mussels and oysters. Likely to consume the planktonic larvae of some species. Known to foul a variety of hard-shelled commercially important and farmed species and man-made structures and equipment.

### **Habitat**

Adults live on the seabed on a variety of surfaces in a wide range of environmental conditions. Highest densities found in wave protected muddy areas. Often attaches to the shells of dead and living hard-shelled invertebrates including scallops, crabs, whelks and mussels. Larvae are pelagic and are found in the water column.

### **How is it spread?**

Adult: Will attach to a number of commercial species transported for aquaculture, including oysters (variety of species), mussels and scallops. This is the primary reason for European spread. Able to attach to and travel with a variety of mobile host species, including the common whelk, scallops, species of crab and turtles. Transport attached to ships hulls, temporary harbour installations rafts and fishing gears (pots and buoys). Attach to and travel with floating litter and debris.

Larvae: Transported long distances in water column with currents and transport in ballast water.

### **Further information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1028>

## Wakame *Undaria pinnatifida*

### **Description and impact**

A large brown seaweed, the stipe has very wavy edges or 'ruffles' at the base, giving it a corrugated appearance. The blade is broad and flattened with a distinct midrib. The margins of the blade are wavy and ribbon-like at the base. Individuals can reach an overall length of one to three metres. Wakame is an annual species with two separate life stages. May compete for space with native species, including native kelp species. May be a nuisance alga, forming rafts where it reaches high levels of abundance and fouling jetties, vessels, moorings and buoys.

### **Habitat:**

Found on hard surfaces, including man-made structures from the low tide mark down as far as 15 metres in clear water. May also attach to bottom dwelling creatures, empty shells, loose cobbles and other seaweed species.

### **How is it spread?**

Ship's hull. Aquaculture operations.

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=3643>

### ***Carpet sea squirt *Didemnum vexillum****

#### ***Description and impact***

Pale orange, cream or off-white colonies forming extensive, thin (2-5 mm) sheets; can form long pendulous outgrowths. Firm, leathery texture and veined or marbled appearance. Numerous small pores in surface close when colony disturbed to produce tiny whitish spots; larger water exits occur at intervals. Colonies can overgrow other sessile fauna and occupy substantial proportion of available space. On offshore banks (Eastern USA), very extensive coverage of seabed, potentially smothering species living in gravel and affecting fisheries and shellfish industries. Decrease in brittlestars and sea urchins noted in one area (Netherlands).

#### ***Habitat:***

Recorded in GB only from marinas and adjacent shallow artificial structures usually at depths from 30 to 65m at salinities > 26 ppt and temperatures of -2°C to 24°C. In other areas of introduction, also occurs on natural cobble or gravel seabed to 80m depth, in tide pools on shore, in seagrass beds and on bivalve aquaculture installations.

#### ***How is it spread?***

Association with marinas suggests transfer on hulls of leisure craft. Movements of aquaculture stock has role in some introductions. Ballast water is also a likely pathway of introduction.

#### ***Further Information***

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1209>

### ***Harpoon weed *Asparagopsis armata****

#### ***Description and impact***

The life cycle of harpoon weed has two morphologically different phases; the sexual (gametophyte) plant is rosy, yellowish pink or whitish pink, erect and spreading, with many feathery branches; up to 30 cm tall with some branches developing as conspicuous harpoon-like barbed structures up to 10 mm long. The asexual plant is rosy pink, filamentous, and forms fine woolly balls 10 - 20 mm in diameter. Harpoon weed is reported to dominate algal assemblages in some locations. Can cause a minor nuisance by sticking to the clothing of people swimming and snorkelling using its barbs. Economic losses to fisheries have been reported due to harpoon weed clogging up fishing nets when it occurs in bloom-like outbreaks.

#### ***Habitat***

The gametophyte occurs in shallow subtidal waters or deep pools on the lower shore, attached to a variety of substrates including rock, and sometimes attaches to other seaweeds by its barbed branchlets. The asexual stage is typically found subtidally; it is epiphytic or sometimes free-living. It is also known to grow in abundance amongst eelgrass beds, for example in the Scilly Isles.

#### ***How is it spread?***

The gametophyte stage attaches itself by its hooks to other material including fragments of other seaweeds and is dispersed through drifting or rafting on surface currents. The asexual phase spreads easily as floating balls. The two stages are thought to be spreading independently by vegetative means.

#### ***Further Information***

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=373>



## **Wireweed *Sargassum muticum***

### **Description and impact**

Highly distinctive large olive-brown seaweed (often over 1m long). The tough, wiry stem has regularly alternating branches with small, flattened oval blades and spherical gas bladders. Lateral branches hang like washing from a line when held out of the water. Wireweed competes with native seaweeds and seagrasses through rapid-growth, shading and abrasion. It is a nuisance in harbours and shallow waters where it is a hazard to boating (entanglement of propellers). It can dominate in rockpools altering the habitat.

### **Habitat**

Wireweed is most successful in areas sheltered from wave action but occurs widely on the coast across a range of exposure. It grows intertidally and subtidally, particularly in rockpools and in shallow water, on hard surfaces in shallow coastal waters and in estuaries.

### **How is it spread?**

Floating fragments of wireweed are transported long distances by ocean currents or by boats and on shellfish. Wireweed reproduces sexually and via floating fragments.

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=3141>

## **Orange-striped anemone *Haliplanella lineata***

### **Description and impact**

Small, delicate anemone, smooth column up to 20mm in diameter and generally olive green or brown with contrasting vertical stripes (orange, less commonly yellow or white). Up to 100 slender tentacles, these and their supporting platform are greyish. Fouls hard substrata in harbours and brackish inshore waters. Associates with mussel and oyster shells, stones and piers. Often found intertidally. May foul hulls of boats as associate of attached bivalve shells. Not thought to have any particular environmental or economic impacts

### **Habitat**

Sheltered estuarine areas, intertidally on hard surfaces including stones, shallowly buried rocks, shells, seaweeds and on artificial structures as part of the fouling community, often in association with mussels or oysters. This species shows extreme physiological tolerances enabling it to colonize areas unsuitable for many fouling species. It can survive for at least two weeks in salinities from 0.5 to 35 ppt, although growth and fission are reduced below 24ppt, and salinities below 7 ppt are ultimately lethal. It can also withstand temperatures from 0 C to 27.5 C and long periods of intertidal exposure.

### **How is it spread?**

Attachment to ship hulls and accidental inclusion in commercial shipments of shellfish and seaweed

### **Further Information**

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1664>

## ***Leathery sea squirt Styela clava***

### ***Description and impact***

A brown, non-colonial (unitary or 'solitary') sea squirt up to 20 cm tall, attached by a small flat holdfast at the base of a narrow stalk, and with two siphons close together at the free end. The surface is tough and leathery, with folds and swellings. The siphons show dark brown stripes when open. A large organism that can achieve high densities and cause fouling to ships. Not noted as a problem to aquaculture in GB, but a severe nuisance to long-line mussel farming in Prince Edward Island (eastern Canada) until replaced by other invasive ascidians. Outer tunic provides extensive settlement surface for other sessile species. It is a relatively large organism that can reach high densities and therefore might have a negative effect on the abundance and habitat occupancy of other shallow-water suspension feeding sessile invertebrates.

### ***Habitat***

Attached to solid surfaces in shallow water, especially in harbours and marinas but also on wrecks and natural rock bottoms.

### ***How is it spread?***

Transport of the hulls of ships.

### ***Further Information***

<http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=3430>

## ***American Lobster Homarus americanus***

### ***Description and impact***

Easily confused with the native European Lobster. Differences can be subtle, but the key characteristic is the ventral tooth on the rostrum of American Lobster. American Lobster may also be slightly larger and different in colour.

A serious risk in GB and Europe as it could have significant detrimental impacts on our native lobster through competition, inter-breeding and by spreading disease. Very uncommon in GB waters (in the past decades there have been 24 confirmed reports in UK waters, although this is likely to be an underestimate). Not believed to be established in GB (i.e. reproducing) but this is possible. Sightings are believed to be as a result of the deliberate release or escape of specimens from captivity.

### ***Habitat***

Most likely shallow coastal waters among boulders, but other habitats and deep water

### ***How is it spread?***

Not believed to be established in GB (i.e. reproducing) but this is possible. Sightings are believed to be as a result of the deliberate release or escape of specimens from captivity.

### ***Further Information***

<http://www.nonnativespecies.org/downloadDocument.cfm?id=1177>

## 5. Reporting sightings of Invasive Non-Native Species

It is important to report suspected sightings of Invasive Non-Native Species so that their distribution can be tracked any necessary biosecurity measure taken.

Reports of invasive species can be made online at i-record <https://www.brc.ac.uk/irecord/enter-non-native-records>

In Scotland, you can also report invasive species **on the Scottish Environment and Rural Services (SEARS) telephone number 08452 30 20 50 or email: [info@sears.scotland.gov.uk](mailto:info@sears.scotland.gov.uk)**

When reporting sightings it is helpful if you can

- take a photo
- identify the location, ideally to the nearest 100m
- note the date and roughly how many you saw