



Alien invaders in estuaries

A guide
to invasive
non-native
species



SEFINS :
Safeguarding the Environment
From Invasive Non-native Species

What are alien species?

Alien invaders, otherwise known as invasive non-native species (INS), are species introduced by humans into an area where they were not present before. This can happen either accidentally or deliberately.

How do they invade?

INS can arrive in an estuary attached to yachts, canoes and other recreational vessels. They can be introduced in contaminated fishing and aquaculture equipment, or may escape from gardens and ponds.

They are able to tolerate (resist) a very wide range of environmental conditions. They can live at a variety of temperature, salinity and pollution levels which allows

them to successfully invade different types of habitat. This flexibility, combined with a high rate of reproduction and limited or no natural predators, means that INS populations can easily expand and start to outcompete local species for space, food and nutrients.

What problems do they cause?

INS can threaten local ecosystems, causing the loss of native flora and fauna. They can spread disease and cause significant changes to the natural environment. INS can also affect human activities by fouling boats and harbours, clogging propellers and damaging fisheries. These problems may be permanent or can cost millions of pounds to sort out.





Invasive species in estuaries

Estuaries are hotspots for INS because of the many human activities that take place in them – they host sailing, canoeing, angling, aquaculture, fisheries, ferry terminals and container ports, to name just a few.

The arrival of INS in your area is linked to increased international trade and travel between Europe and the rest of the world. Here are some of the main routes by which alien species arrive:

- They are imported

INS are frequently brought to a new area because they are desirable for commercial or ornamental purposes. Some species might be released deliberately so they can be harvested, whilst others escape into the wild, e.g. from fish or shellfish farms. INS can also be hidden in sand, gravel and soil imported from other areas.

- Hitch-hikers

INS can arrive using human transport, hitch-hiking on commercial and industrial boats as well as yachts and other leisure craft. They can be attached to hulls, buoys, pontoons and fishing equipment, or can travel in the ballast water and sea chests of large cargo ships.

- Natural methods

Sometimes INS can spread from an invaded area to other areas close by using natural methods, such as tides, currents and floods.





How do you prevent an alien invasion?

Prevention is the best way to tackle the threats of INS. There are many ways you can help:

- Know your aliens!

Get to know which species are on the horizon in your local area – rapid detection and reporting of invaders is essential to stop them from settling in and taking over.

- Do your bit!

The risk of INS attaching to your boat increases the longer your boat stays in the water - regular cleaning of hulls and anchors and using anti-fouling paint will help to reduce invaders.

- Stop the spread

Are you accidentally spreading INS on your water sports equipment and clothing? Follow these 3 simple rules to stop the invaders:

CHECK your equipment for live plants and animals, particularly in areas which are damp or hard to inspect

CLEAN and wash all equipment and clothing thoroughly after use

DRY all your equipment – some species can live for days in moist conditions. Make sure you don't transfer water from one area to another.



Japanese shore crab

Scientific name: *Hemigrapsus sanguineus*

Other Names: Asian crab

Description: Small crab with a square carapace (shell) with 3 distinct 'teeth' on either side. Colour varies from orange-brown to purple to greenish-black, with banding on the walking legs and red spots on pincers (claws). Males have fleshy bulb at the base of the pincer. Up to 5 cm in size.



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Japanese shore crab

Habitat: Intertidal or shallow subtidal zones of exposed rocky shores, but also found in soft sediments and estuaries under the shelter from artificial structures, mussel beds and oyster reefs. Lives in a wide range of temperatures and salinities.

Range: Northern European coastlines, from France to Germany. Established on Channel Islands and southern UK coastline.

What is its effect? Achieves high densities, causing reductions in native crab populations due to predation and competition. Predates larvae and juveniles of native snail, barnacle and polychaete species. May damage commercial and wild mussel and oyster populations.

How does it spread? In ballast water, hull fouling and commercial oyster transportation. Spread locally by water currents.

Its history: First recorded in Europe in France in 1994.

Native to: Western Pacific Ocean, along the coastline from Russia to Japan.

Confusion Species:

Common green shore crab (*Carcinas maenas*):

Very common, usually green in colour. Carapace (shell) is wider than it is long (up to 6 x 9 cm), with 5 short teeth on the front behind each eye and 3 undulations between the eyes.



Green shore crab

© Luis A. Solorzano

Quagga mussel

Scientific name: *Dreissena rostriformis bugensis*

Other Names: *Dreissena bugensis*

Description: Invasive freshwater mussel, closely related and similar to zebra mussel. Small in size (5 cm or less), stripy shell with a rounded shape. Wavy line created where the halves of the shell meet. Will roll to one side when placed on its front. Relatively easy to detach from a surface.



© Arjan Gittenberger

Quagga mussel

Habitat: Freshwater rivers, canals and lakes.

Range: Major waterways in the Netherlands, Belgium and France. Recently discovered in Surrey in the UK.

What is its effect? Significantly alters ecosystems by filtering out nutrients. Causes serious biofouling, blocking pipes and smothering boats and underwater structures. Suffocates native mussels.

How does it spread? Larvae are not visible to the naked eye. Spread through transfer of boats, jetties and fishing equipment between water bodies. Remember to **Check, Clean, Dry** to prevent invasion.

Its history: Discovered in an estuary in the Netherlands in 2006. Arrived in the UK in 2014.

Native to: Ponto-caspian region of south-east Europe .

Confusion Species:

Zebra mussel (*Dreissena polymorpha*): Very similar and also invasive, can be difficult distinguish between the two. Shell has a strong ridge, creating a 'D' shape. Does not roll to one side when placed on its front. Straight line created where the shell halves meet. Live mussels are more difficult to detach from a surface than quagga mussels.



Tree groundsel

Scientific name: *Baccharis halimifolia* L.

Other Names: Sea myrtle, Saltbush, Eastern Baccharis

Description: A dioecious shrub up to 4 m tall. Leaves alternate, simple, obovate with sticky glands on both sides. Capitula in open terminal panicles, flowering in autumn.

Ecology: Tree groundsel grows well on poor, dry to moist soil and can survive salty conditions. It is often planted as an ornamental species in the coastal areas of NW France and Belgium.

Threat: Tree groundsel can alter coastal habitats by pushing out native species and forming dense, impenetrable thickets of vegetation. The plant produces lots of seed, helping it to spread very easily. Tree groundsel is established in the southern UK, NW France and coastal areas of Belgium.

Control: Tree groundsel can be controlled by mowing the plant, followed by treatment with herbicide. This should be repeated 1-3 times. Small infestations can be controlled by uprooting the shrubs.

Similar species:

When sterile, tree groundsel can be confused with strawberry-tree (*Arbutus unedo* L.). No other shrub from the daisy family is found in estuarine areas in NW Europe.



Tree groundsel

© G.Fried



© G.Fried

Tree groundsel



We need your help to turn the tide on the alien invasion!

That's Invasive is a free smartphone app containing all the information you need to confidently identify over 35 invasive non-native species, including an extensive gallery of photographs.

SEFINS (Safeguarding the Environment From Invasive Non-native Species) is a European project working to better understand, manage and increase awareness of invasive non-native species (INS).

The Interreg 2 Seas Programme is an EU funding programme which promotes cross-border cooperation between partners from France, England, Belgium (Flanders) and The Netherlands. It aims to develop the competitiveness and the sustainable growth potential of maritime and non-maritime issues through the establishment and development of cross-border partnerships.

For further information on SEFINS, please visit www.sefins.eu

For further information on the 2 Seas Programme, please visit www.interreg4a-2mers.eu

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