



Clean boats - clean waters

Help Stop aquatic hitchhikers

Boat Use and Invasive Species in the UK and Ireland

What are invasive species and what is the problem?

The spread of invasive species – plants, animals and other organisms that are not native to our waters - is becoming a major issue in both marine and inland waters around the world.

Hull fouling of recreational boats has been identified as one of the key ways that species migrate within a country. Recreational boat owners and users can help to ensure that they do not introduce, or help to spread, invasive species.

Invasive species are a problem because they compete with native plants and wildlife and can cause major changes to waterways. Examples include changes in:

- the type and number of native species present,
- the conditions for spawning and feeding for native fish,
- water quality and clarity,
- the amount of weed growth.

Impacts of invasive species can be expensive and can include increased costs for keeping waterways free of weed, for keeping drinking water abstraction points free and for monitoring and eradicating the spread of non native species. Many countries affected, including Britain, spend millions on the clearance of invasive species.

The majority of invasive species in our coastal and inland waters are thought to have been introduced by:

- natural transfer by wind and tide;
- gardeners e.g. through escapes of plants meant for garden ponds
- commercial shipping e.g. emptying ballast tanks containing water and sediment from another country or area into UK and Irish waters, or by species attached to the hull
- aquaculture (introduction of e.g. Signal crayfish)
- recreational boaters on hulls and equipment and in bilge waters

Boating and its role in the spread of invasive species

The main means of transport for invasive species via boating is either by attachment to hull or propeller, or carriage within bilge or ballast water or in engine coolant. In jet skis

for example water is retained within the craft when it is returned to the trailer and this water may be discharged into the next waterway site used.

Invasive species may also be carried on anchors, warps or on items which have contact with water such as oars and paddles, fishing equipment or tenders. Trailers often contain spaces that hold water during transit and this may also contaminate other waters when the boats are launched.

Boats that are used on more than one water body such as canal and cruising boats, personal watercraft (jet skis), small sports boats, sailing dinghies etc are most likely to present a risk. Boats with water ballast and those which cruise or race to new waters can carry invasive species very easily. Angling can also transfer species from one lake to another through boat use and also through fishing tackle and nets.

Some aquatic species can live a surprisingly long time out of water, Zebra mussels, for example, have been known to survive for as much as a month, particularly during damp weather, and this needs to be taken into account in preventing their spread.

Places at risk

All coastal and inland waters are important for biodiversity. Some areas however are more important because they contain rare species that have been identified as being of European or world importance. These sites, often have some sort of designation eg Sites of Special Scientific Interest (SSSIs or ASSI in Northern Ireland and Natural Heritage Areas in Ireland), Special Protection Areas for Birds (SPA), Special Areas of Conservation (SACs), or Ramsar sites. Sad examples include

- Bassenthwaite Lake in the Lake District where New Zealand Pigmy weed is threatening the natural balance of species in the lake;
- Strangford Lough in Northern Ireland where several invasive seaweeds have been found;
- The spread of curly leaved waterweed through lakes in Ireland.
- In Scotland the spread of the Signal crayfish is threatening the native crayfish which is of both national and European importance.

Details of sites in the UK with nature conservation designations can be viewed through links from the Joint Nature Conservation Committee website www.jncc.gov.uk/page-4 . Sites in Ireland can be viewed at www.npws.ie/en/ProtectedSites

Water Framework Directive

Threats from invasive species have been assessed as part of efforts to meet the standards of the EU Water Framework Directive (WFD). Information on the species, their distribution and the level of risk is available within WFD Characterisation Reports. There are around 60 species of concern in the UK (see www.marlin.ac.uk/marine Aliens), we have outlined some of the key species relevant to the boating community below.

Key Species of Concern to Boaters in Inland waters

Zebra Mussel – *Dreissena polymorpha*

The zebra mussel is a stripy, freshwater mussel native to the Caspian sea area of eastern Europe. They form large colonies that attach to almost any hard surface. They change nutrient cycling, water clarity and phytoplankton levels in waters, affect the feeding, spawning and nursery conditions for several important species such as eels, pollan, trout and native fresh water pearl mussels and can change the balance of the fish populations, which in turn affects feeding cycles for birds. Zebra mussels accrete to important infrastructure such as water abstraction points, boat hulls, propellers, and moorings and can reach densities of up to 100,000 per m².

Zebra mussels have been in Britain since the 1820s, but have only spread widely and become a major problem since 2000. They were first seen in Ireland in 1994, within three years they had spread widely to the whole Shannon system and into Lough Erne in Northern Ireland. In 2006 they were found in Lough Neagh. To date they have not been detected in Scottish waters. Zebra Mussels are a freshwater organism. Their spawn travels downstream with the current and in normal circumstances cannot spread upstream of where they have been introduced. There are many instances of upstream spread through the use of contaminated fishing tackle or travel on boat hulls and in bilge water.

The costs of dealing with zebra mussel encrusting on waterways in the USA has reached \$3bn per year. Costs in Britain and Ireland are beginning to rise. It is important that the spread of zebra mussels is halted or slowed and that boat users become aware of their potential role in controlling the movement of the mussels and their larvae. Zebra mussels are not easy to eradicate once they are in a new



water body due to the potential to poison other species.

Australian Swamp stonecrop, *Crassula Helmsii*

Also known as New Zealand pigmyweed – This species was introduced as an ornamental plant for garden ponds and has escaped into the wild. Even small pieces carried into a new water body can colonise quickly and out compete native species.. It does not die back in winter and creates dense stands that can choke waterways.

It is native to New Zealand and Australia, has been known in Britain since 1911 where it is widespread and in Ireland since 1984 where it is present in a few locations.

Particles of this plant can become snagged in propellers or equipment and be unwittingly transported attached to the boat.



Water Fern - *Azolla filiculoides* also known as Fairy Moss and Mosquito Fern

A floating fern which forms rafts on the surface of the water and can have the appearance of moss., Native to NW America and introduced to garden ponds and aquaria. Present in Lough Neagh and several other lakes in NI.

Photos courtesy of *Ian Dodkins* is a researcher in aquatic macrophyte ecology at the University of Ulster, Coleraine.



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Floating pennywort - *Hydrocotyle ranculoides*

Floating pennywort is a plant escaped from garden ponds. It is capable of rapid colonisation and can choke waterways when well established. It out competes native flora and is seen as a major threat to water bodies throughout the UK and Ireland.



Parrots feather - *Myriophyllum aquaticum*

Parrot's Feather is a native plant of Central America and has colonised mainly shallow ponds in Southern England



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Signal crayfish - *Pacifastacus lenusculus*

This is a large crayfish found in lakes and rivers. It originated in North America and has been spread to parts of the UK through aquaculture. The species displaces native crayfish which are specially protected under EU legislation. Signal Crayfish are also a vector for a crayfish fungus called crayfish plague, which affects native crayfish.

Signal crayfish can be transported accidentally as juveniles on fishing nets, in water inside canoes and rafts and on fishing equipment.



Curly Leaved Water Weed - *Lagarosiphon Major* (on right in illustration) also known as Curly Water Thyme

Curly water Weed is a water plant that can grow to 6 metres (20 feet) deep in water is capable of taking over significant areas of the large lakes. It forms very dense infestations and poses serious problems for angling, boating, environmental and tourism interests. It creates poorer living conditions for native plants, fish, birds and insects and can ultimately displace them from their natural habitats. This weed originated in Southern Africa and it is believed to be an escape form ornamental garden ponds. The weed is present in Lough Corrib in Ireland



There are other freshwater aquatic plants posing significant risks to recreational waters and their natural habitats e.g. Nuttalls Pondweed *Elodea Nuttallii*. Most plants however cause the same issues and advice to boaters is similar.

Marine and coastal waters – species of major concern to boaters

Japanese weed – *Sargassum muticum* also known as Wireweed

A large olive brown seaweed with long main branches, often over 1m long and which support branches with air bladders and leaf-like structures. It was introduced to the UK from the Pacific and is now quite widely distributed. Eradication attempts have been unsuccessful and management now focuses on trying to stop its spread. It can be transported unwittingly on boat hulls and through propeller snagging. Other alien seaweeds of concern are Wakame *Undaria pinnatifida* which has been found on the English south coast, and Green sea fingers *Codium fragile* subspecies *tomentosoides* which is quite widespread including in some marine Special Areas of Conservation



Chinese Mitten Crab –*Eriocheir Sinensis*

A large crab up to 80mm wide with distinctive hairy mittens like features on its claws. Young crabs live in freshwater and migrate to estuaries as adult to breed. The The mitten crab can travel extraordinary distances. In China it migrates up to 1,500 kilometres along some rivers. The crab was probably introduced to Britain in ships' ballast water. The mitten crab is capable of causing structural problems because it can burrow into mud riverbanks, riddling them with holes until they collapse. May be transported inadvertently in nets or boats.

**Code of practice for boaters****Avoiding introduction or spread of invasive species**

Boats and boat trailers, and some other equipment associated with boats, can easily spread invasive species. The following good practice should be followed by all boaters:

Whilst boating:

- When boating do not run through water plants and seaweed if possible. Parts of the plants may get caught up on the hull or propeller and then can be transferred to another area.
- Use appropriate antifouling in inland and coastal waters to stop species such as Zebra mussels adhering to the boat. More information on the environmental aspects of antifouling on www.thegreenblue.org.uk
- Risks of acquiring invasive hitchhikers on the boat increase the longer the boat is kept in the water. Consider only keeping the boat in the water when it is needed.
- Never use live bait taken from zebra mussel infested waters in any other watercourse, and never use zebra mussels as bait.

Before transferring your boat to another waterway

- Consider hiring a boat already in the new waterway if you do not intend to keep your boat there permanently.
- Drain water out of every part of the boat and all of its equipment that can hold water, in particular:

- Follow factory guidelines for eliminating water from engines. Jet drives can hold extra water.
- Remove the drain plug or bungs from boats and put the boat on an incline to drain
- Drain wells, bilges etc
- Empty out kayaks, rafts, inflatables and tenders.

Inspect the hull of the boat, the trailer and any equipment for visible plant, fish, animal or other fragment including mud which can house larvae, and plant materials. Remove any such materials and put them into a dustbin, not back in the sea.

To be totally sure of a clean boat use high-pressure water or water above 104° F (40° C) to clean trailers, boats and equipment. You can often make arrangements with car washes and MOT cleaning stations (in the same water catchment) for these services.

If you find evidence of invasive species call the local office of the Environment Agency, Countryside Council for Wales, Scottish Environmental Protection Agency or Environment Agency N Ireland.

When buying a new boat from another area or country:

Insist that the boat is cleaned according to the specifications above whilst in the area of origin, and ensure that all bilge and engine waters are drained before delivery to your home waters. Try to leave the boat in an open place, exposed to wind and sunlight, with dry bilges for 4 weeks to decrease the chances of organisms hitchhiking on the boat.

If you are a yacht or boat club

Develop a policy in relation to the cleaning of boats prior to introduction to club waters. If you run events that bring boats into your area include information about invasive species and how to prevent their transfer in your pre-event information.

Travelling to other countries with your boat

The transfer of invasive species by recreational craft is increasingly being recognised internationally as an issue in protecting natural biodiversity. Some countries, e.g. Australia are currently investigating new laws which may require boats to be thoroughly cleaned before entering their waters. If you plan to cruise to another country check the local laws first.

Frequently asked questions:

Where can I find out whether there are invasive species in the waters where I keep or use my boat?

http://www.marlin.ac.uk/marine_aliases/links.htm has a list of relevant links where you will be able to find up to date information about invasive species in your area.

Where can I read more about this issue?

The following documents and websites provide more information for those with an interest:

N. Clare Eno, Clarke R. A., Sanderson W.G. Eds. 1997 *Non Native Marine Species in British Waters: a Review and Directory*. Joint Nature Conservation Committee provides a detailed overview of the topic and the marine species concerned.

<http://www.plantlife.org.uk/uk/plantlife-campaigning-change-invasive-plants.html> has detail of invasive aquatic plants in Britain and their vectors.

<http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/InvasiveSpecies> provides data on invasive species in Scotland

www.habitas.org.uk/invasive lists and provides detail of invasive species of concern in Northern Ireland in inland and marine waters

<http://www.invasivespeciesinfo.gov/aquatics/main.shtml> provides information on invasive species in the USA in inland and coastal waters (many of the species are relevant to UK waters).

www.imo.org the website of the International Maritime Organisation contains detail of international conventions to limit the spread of invasive species. This organisation is likely to be the hub of any future international efforts and coordinated regulation on the spread of invasive species by recreational boating.

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