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Ireland



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## *Field Guide to Invasive Species in Ireland*



**2<sup>nd</sup> Edition**





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## Introduction



Non-native species are species that have been introduced, either intentionally or unintentionally, outside their natural range. Many of these non-native species live in harmony with our native species causing no adverse impacts. A few non-native species though become what is known as 'invasive' as they thrive in our habitats and out-compete our native flora and fauna. These invasive non-native species or invasive alien species, as they are also referred to as, are widely recognised as one of the greatest threats to our native biodiversity, second only to that caused by habitat destruction. They not only have negative environmental impacts but they can also adversely impact on recreational activities such as walking, boating, fishing, swimming and various other water-based leisure pursuits. They can also have serious associated economic costs.

Once an invasive species has established within a habitat its spread can be rapid, out-competing native species. The spread of most invasive plant species is by plant fragments or seed, while invertebrates or mammals can move independently within aquatic or terrestrial habitats or hitch rides on the hulls of boats or on equipment. To minimise the risk of spreading or introducing non-native invasive species please rigorously follow the following guidelines.

**Inspect > Remove > Dispose > Report**



## How you can help



### How you can help:

**Inspect:** all equipment that has been in a waterbody (boats, trailers, engines, outboards, dredgers, weed cutting or harvesting boats, cruisers or even clothing) or terrestrial site for attached vegetation, contaminated soil or obvious animal life before moving to another waterway, catchment or site.

**Remove:** any adhering plant, soil or animal material from your equipment before relocating to another watercourse, section of waterway or site. Ensure that all water is drained from your boat and equipment before transportation to another site and all soil is removed from machinery, as this may contain seed or plant fragments.

**Clean:** power hose all equipment. Use hot water (>60 degrees centigrade) where possible.

**Dispose:** of all plant material and animal material appropriately. This material should be contained in sealed bags or containers prior to removal. Do not throw them back into the water or leave them lying at the waters edge.

**Report:** Report any sightings of an invasive species on the [www.invasivespeciesireland.com](http://www.invasivespeciesireland.com) website in the 'Alienwatch' section.

**Inspect > Remove > Dispose > Report**

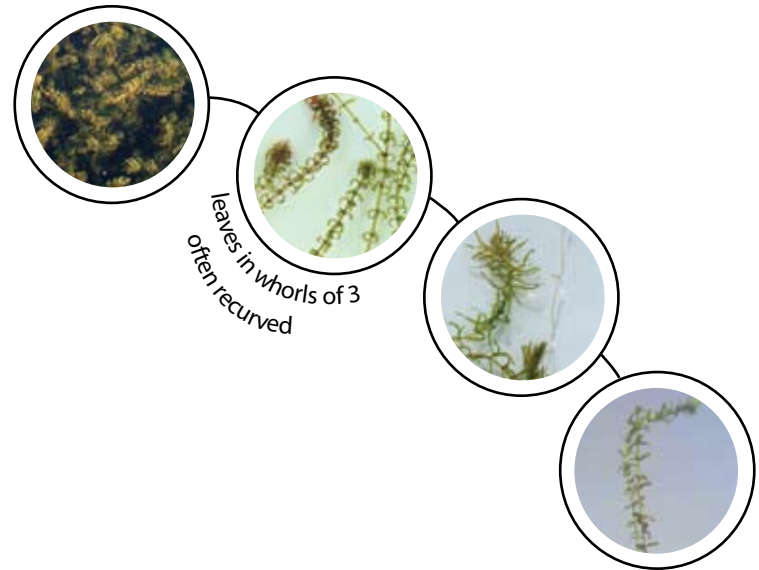


## Nuttall's pondweed - *Elodea nuttallii*



Nuttall's water-weed is similar to the Canadian pondweed (*Elodea canadensis*) and, like it, is an invasive species originating from North America. The first reports in Ireland were in the mid-1980s. It is a perennial submerged plant, growing in still and slow flowing water and it thrives in eutrophic waters. It is a freshwater plant but it is tolerant of moderately saline water.

Over the past twenty years it has spread rapidly, by vegetative means only. Where it establishes it can form exceptionally dense monocultures, excluding native species. It can occupy the water column from bed to surface. As a consequence, biodiversity suffers immensely following its introduction. It also interferes with any form of amenity usage of the infested waterbody.



*One Small Fragment can infest an entire waterbody*

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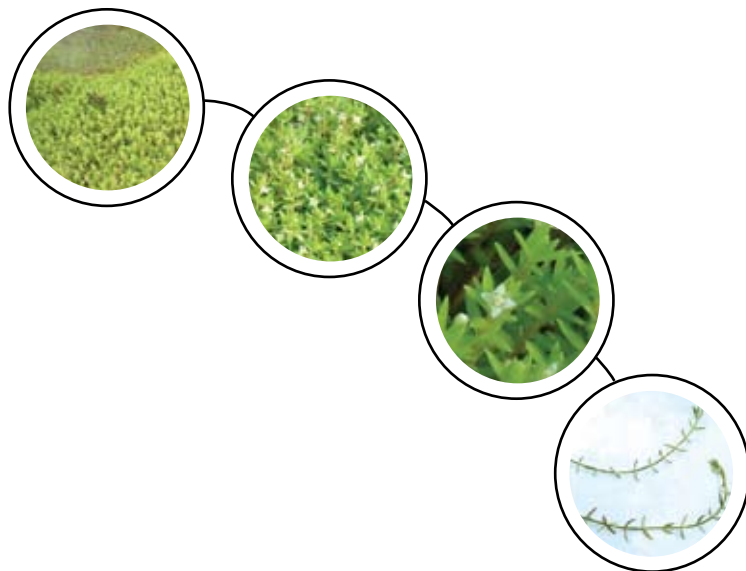


## New Zealand pigmyweed - *Crassula helmsii*



Also known as Australian swamp stonecrop. It is an aquatic or semi-aquatic species. The first record of this species in Ireland was in 1984 from an artificial pond in Gosford Forest Park, County Armagh. It has spread very rapidly in watercourses in Britain and has the potential to do so likewise here.

It forms dense submerged and emergent stands in ponds, small lakes and canals. The plant grows on the muddy margins of ponds where it forms dense carpets with up to 100% cover, or semi-submerged in deeper water, or totally submerged with elongated stems. It does not die back in winter. In suitable aquatic habitats the biomass produced is sufficient to eliminate native plants and creates inhospitable conditions for macroinvertebrates and fish.



*One Small Fragment can infest an entire waterbody*

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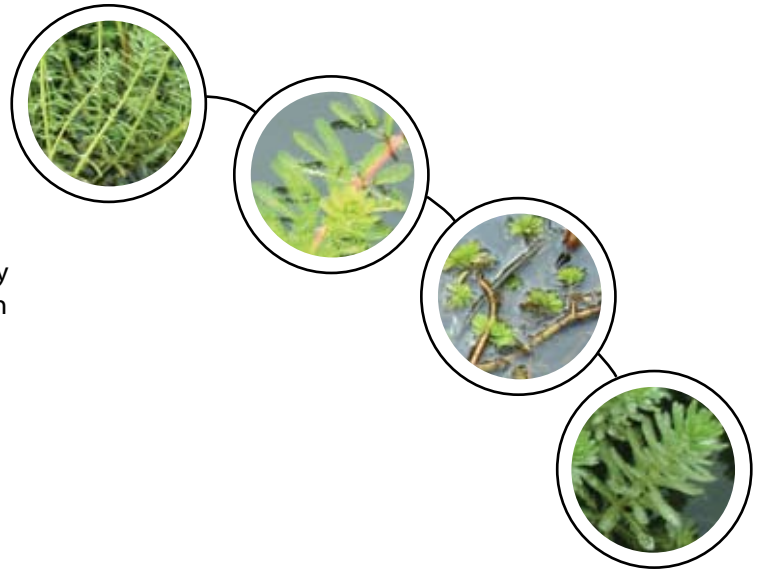
Photos by Joe Caffrey (CFB)



## Parrot's feather - *Myriophyllum aquaticum*



This species is native to the Amazon Basin in South America. It was first recorded in Ireland in 1990. It is a perennial plant that grows submerged but it also produces emergent, feathery shoots. It grows vigorously in static or slow flowing habitats. Following introduction to a suitable freshwater habitat it rapidly spreads within the waterbody, damaging the natural ecosystem and impairing recreational activities.



*One Small Fragment can infest an entire waterbody*

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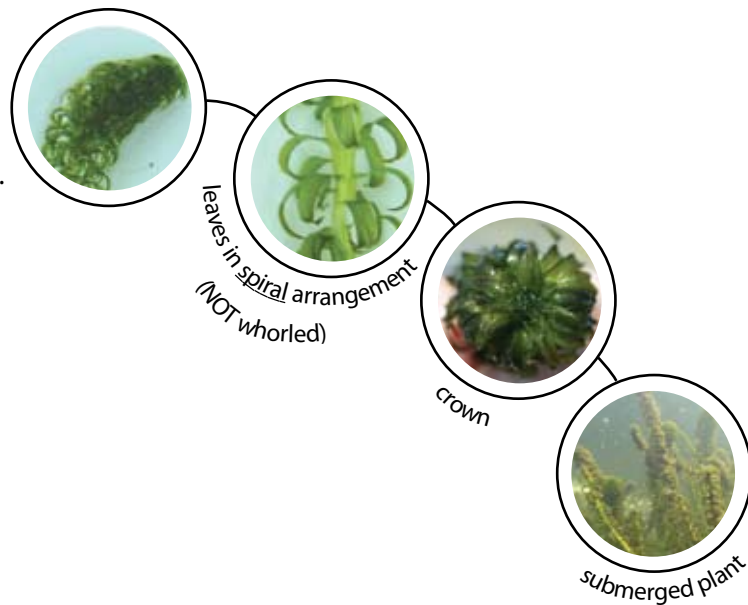


Photos by Joe Caffrey (CFB)

## Curly leaved waterweed - *Lagarosiphon major*



*Lagarosiphon major* grows in water up to 5 metres deep. It is commonly sold as an oxygenating plant. In Ireland it has had a serious impact on Lough Corrib where it has grown with such vigour it has already excluded the native flora from the bays in which it is established. It restricts angling, boating and other water based activities. It spreads by fragmentation. Plant fragments can easily be spread from one waterbody to another on the hull of boats, trailers, outboard motors or angling equipment.



*One Small Fragment can infest an entire waterbody*

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Photos by Joe Caffrey (CFB)



## Fringed waterlily - *Nymphoides peltata*



This small yellow flowered waterlily is locally established in lakes and ponds in Ireland. It thrives in shallow (<1.5m deep) and nutrient rich waterbodies. It spreads rapidly and carpets extensive areas of a waterbody. By doing so it restricts light to native aquatic plants and effectively out-competes them. In angling waters it obstructs free casting, makes it difficult for fish to be safely landed and restricts boat movement.



*One Small Fragment can infest an entire waterbody*

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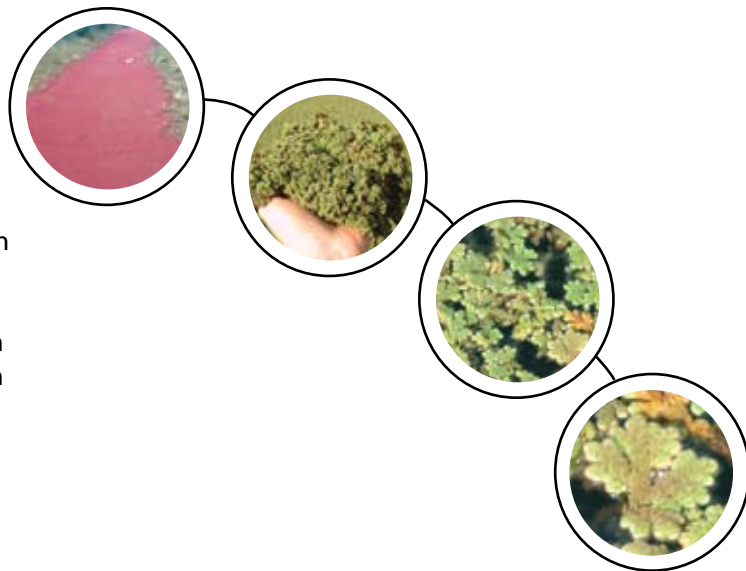
Photos by Joe Caffrey (CFB)



## Water fern - *Azolla filliculoides*



This is a small free floating water fern that grows and thrives in canals, ponds and sheltered aquatic habitats. In suitable waterbodies it can carpet the water surface in considerable areas. By excluding light it eliminates native submerged flora. It also prevents diffusion of oxygen from the air to the water, which can result in low oxygen conditions leading to fish kills. It can have serious health and safety implications as it may be mistaken for solid ground. It can also interfere with recreational water based activities. In late autumn/winter it can turn red in colour.



*One Small Fragment can infest an entire waterbody*

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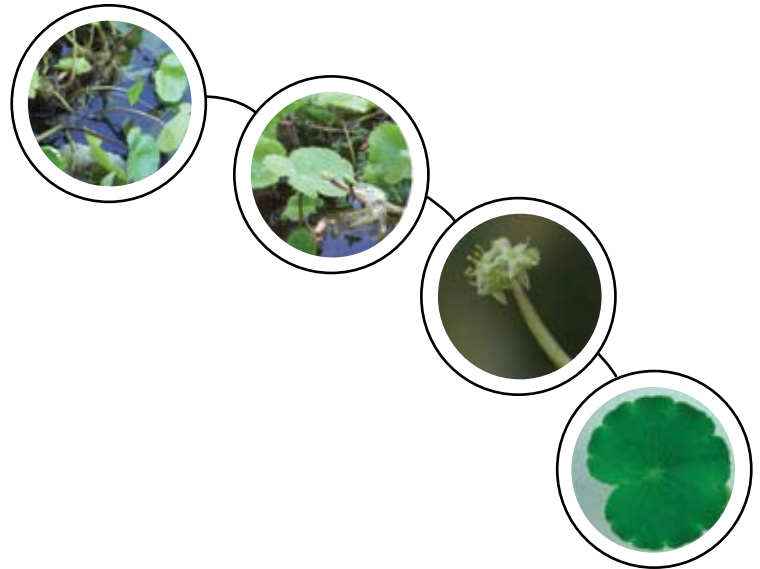


## Floating pennywort - *Hydrocotyle ranunculoides*



Native to North America this weed was first brought into Ireland as a plant for tropical aquariums and ponds, but it has since escaped into the wild. It is a floating or creeping, mat-forming perennial plant. It thrives in shallow still flowing waterbodies, rooting in water less than 1 metre in depth.

It resembles a larger, more robust, version of the native Irish Marsh Pennywort. The leaves are typically 2 to 8cm in diameter and are kidney shaped, with a distinctive 'V' indentation into the centre of the leaf being the main distinguishing feature from the native Irish Marsh Pennywort. It forms thick dense mats across a waterbodies surface effectively blocking out any light to native vegetation below. It also increases the risk of flooding. In angling waters it obstructs free casting, makes it difficult for fish to be safely landed and also restricts boat movement.



*One Small Fragment can infest an entire waterbody*

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Photos by John Early (NIEA) and Jonathan Newman (CEH)

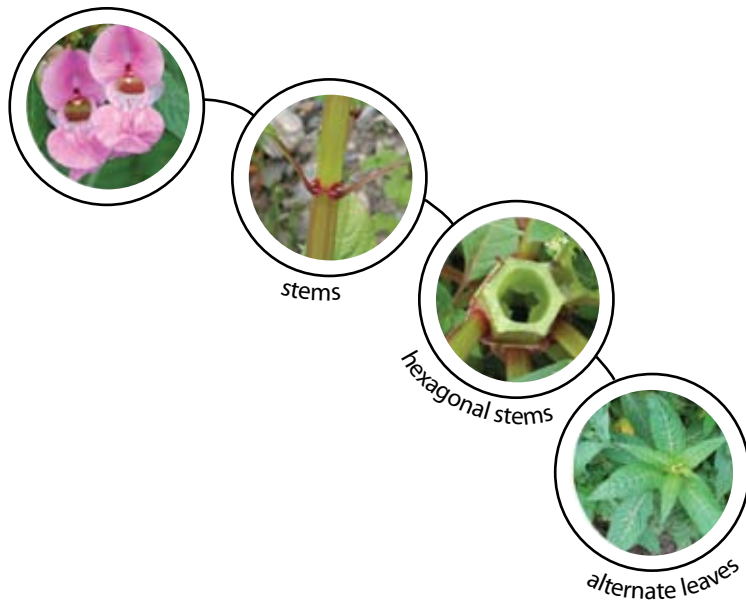


## Himalayan balsam - *Impatiens glandulifera*



Introduced to the wild by escaping from gardens this plant is rapidly colonising river banks and other areas of damp ground. It is an annual plant which can grow up to 3 metres in height with purplish – pink to pale pink flowers in June-August. When the seed pods are mature they will explode scattering the seeds up to 7 metres from the parent plant. In many cases these seeds are then spread downstream in rivers and streams.

It grows in dense stands along the banks of rivers and streams effectively blocking out and suppressing any native vegetation. When it dies back in autumn it leaves the banks bare and exposed, increasing erosion during the winter months. This can result in bank collapse and increased sediment deposit into the waterway affecting fish spawning and the river ecosystem.



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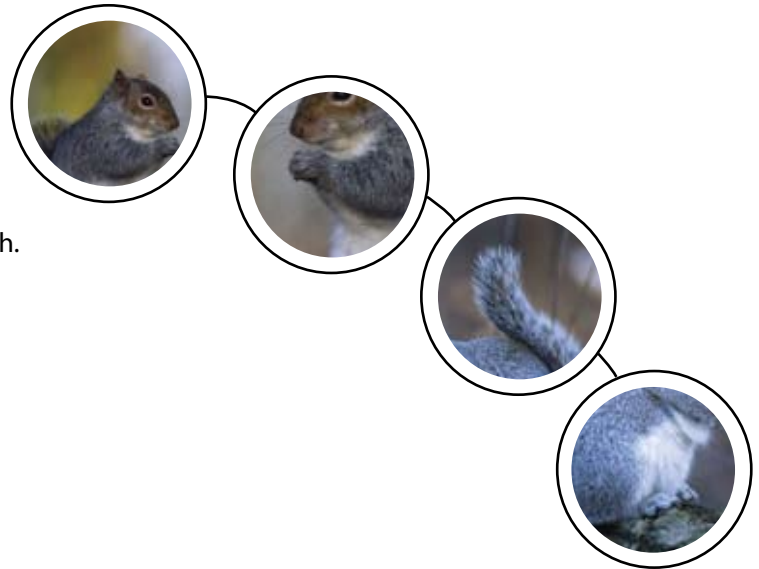




## Grey Squirrel - *Sciurus carolinensis*



The grey squirrel is a serious threat to our native red squirrel. It is larger than the red squirrel and will out-compete it for food and habitat. The grey squirrel can carry and spread a virus to which they are immune, but it can be potentially fatal to the red squirrel (Parapox virus). Grey squirrels can also damage woodlands by stripping the bark off trees, which can lead to their death. Within 15 years of grey squirrels being introduced to a woodland, red squirrels can disappear from the area, as has been the case in many of Ireland's forests.



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Photos by Tom Ennis

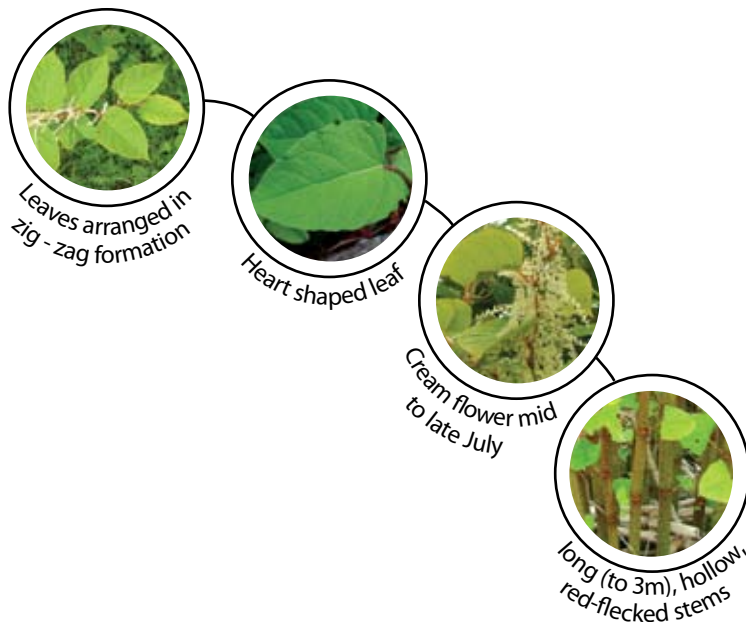
## Japanese Knotweed - *Fallopia japonica*



Japanese knotweed was first introduced into Ireland as an ornamental plant. It has since infested a wide range of habitats, including the banks of rivers. It can grow up to 3 metres in height and forms very dense monocultures along river corridors. The rhizomes (roots) are very extensive growing up to 3 metres in depth and up to 7 metres laterally from the parent plant.

Japanese knotweed is spread entirely via the movement of soil material contaminated with the rhizome or via plant material, as only female plants occur in Ireland. Spread is rapid and results in the exclusion of native species that function to maintain bankside stability along rivers. In the winter when it dies back it results in the banks being left bare and vulnerable to erosion.

*One Small Fragment can infest a new site.*



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Photos by Joe Caffrey (INVAS)



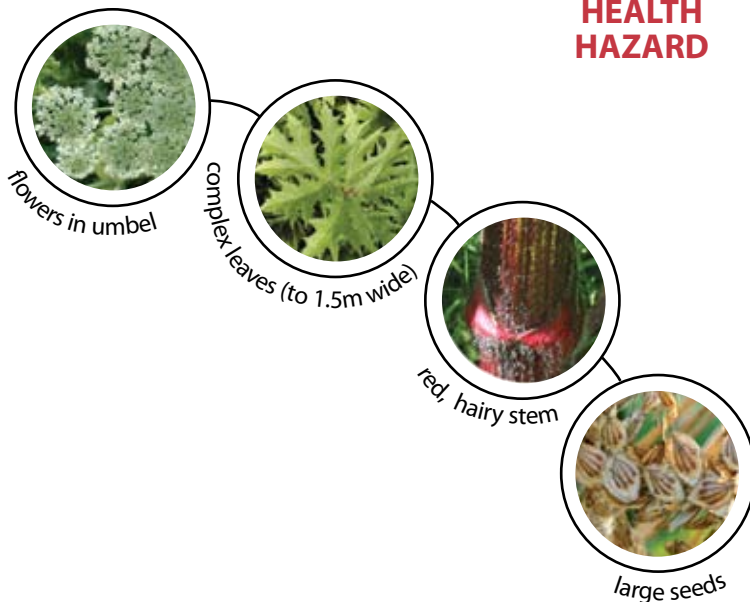
## Giant hogweed - *Heracleum mantegazzianum*



**HUMAN  
HEALTH  
HAZARD**

This plant was introduced as an ornamental garden plant from south west Asia in the 19th century. It is common along river banks, wasteland and road sides. It bears a close resemblance to hogweed and cow parsley, but is distinctive due to its size (often 3-5 metres tall). Its leaves can grow up to 1.5 metres in width. It flowers between June and September producing several thousand seeds per plant.

It produces a sap which is hazardous to humans, particularly in the presence of direct sunlight. Serious infestations can lead to the closure of public footpaths and recreational areas. The large leaves create sufficient shade to suppress native vegetation. On river banks and slopes during the winter when it dies back it leaves the soil exposed and more vulnerable to erosion.



*Can lead to an entire area being infested*

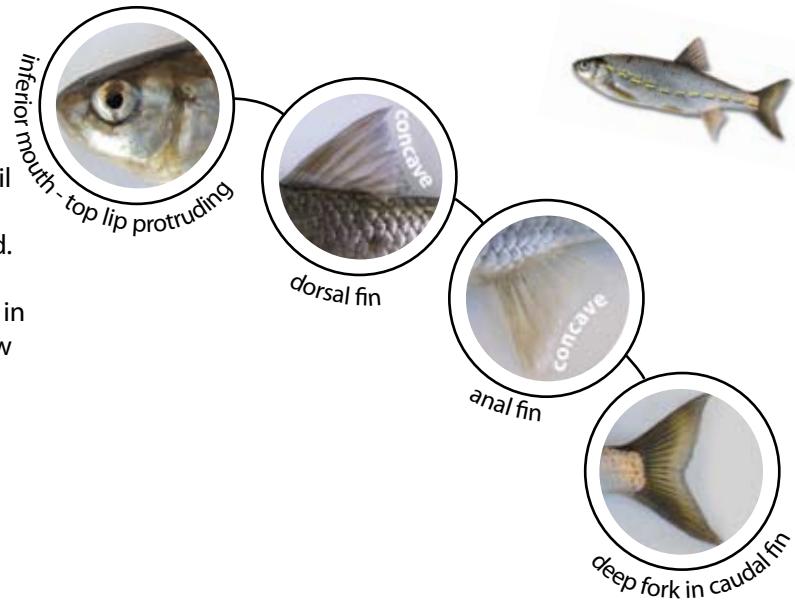
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## Dace - *Leuciscus leuciscus*



Dace was introduced to the Blackwater in Munster in 1889. It was not recorded in any other catchment until the late 1970s. In southern Ireland they are spreading rapidly in waters, to which they have been introduced. Dace competes for habitat, food and spawning substrates with native fish species. The dace is similar in appearance to roach, but is distinguished by its yellow (not red) eyes and the slimmer silver/green body.



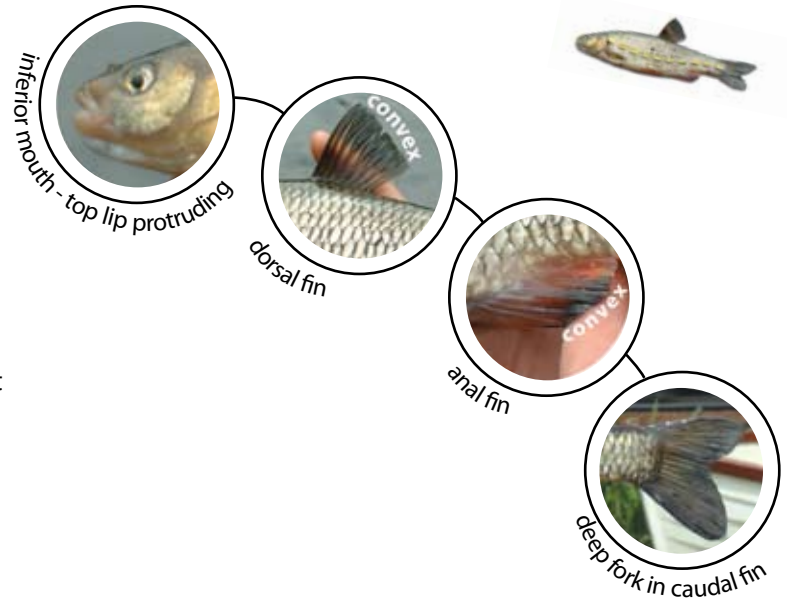
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## Chub - *Leuciscus cephalus*



Chub is a cyprinid fish that is widespread throughout central and southern Europe. It is indigenous to England. Until 2004, it had not been formally recorded in Ireland. It is a species that inhabits rivers with a moderate flow, but can also be found in lakes. It was most likely intentionally introduced into Ireland. Chub feed on aquatic plants and invertebrates when young but, as they mature they feed more selectively on larger prey, including young fish. Their spread and proliferation could result in an imbalance among our native fish communities.



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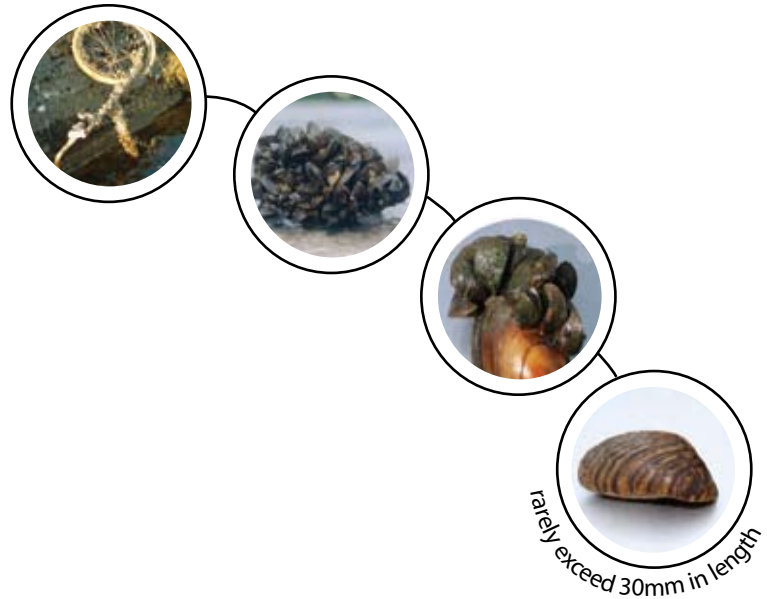
Photos by John Coyne (CFB)

## Zebra mussel - *Dreissena polymorpha*



This small, but prolific, mussel was introduced into the Shannon Estuary in the 1990s by the movement of boats. Zebra mussels live in freshwater and in the upper reaches of tidal estuaries. They have spread from the Shannon Estuary, principally via recreational water use into unconnected water bodies, such as Lough Neagh. Their arrival in Lough Erne led to significant changes in native fish communities and changes in aquatic plant growth.

They are filter feeders and remove much of the plankton that juvenile fish depend upon and mask the water bodies natural response to eutrophication. They can result in toxic algal blooms which impact on drinking water. They DO NOT JUST MAKE THE WATER CLEANER! They attach to any hard surface, such as boats, buoys and water intake pipes, where they form very dense clusters. As such, they can cause problems by blocking out-pipes and clogging cooling systems.



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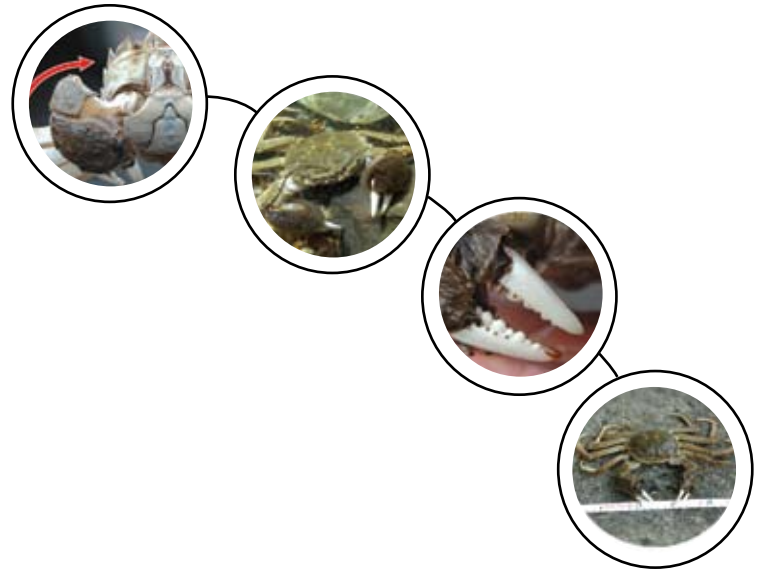


Photos by Joe Caffrey (CFB) and NIEA

## Chinese mitten crab - *Eriocheir sinensis*



This crab is recognisable by the hair-like covering (mitten) on its distinctive white-tipped claws. It is native to China and was most likely introduced via ballast water. Ireland does not have any native freshwater crabs. It was first recorded in Ireland (Waterford estuary) in 2005 and has subsequently been recorded from the lower reaches of the River Suir and Barrow. As the crab migrates upstream it burrows into the banks to live. It feeds on invertebrates and fish. Where present in large numbers they can impact on native fish populations and cause subsidence of river banks. It is also known to carry a parasite in cases, known as a lung fluke, which can be harmful to humans if ate.



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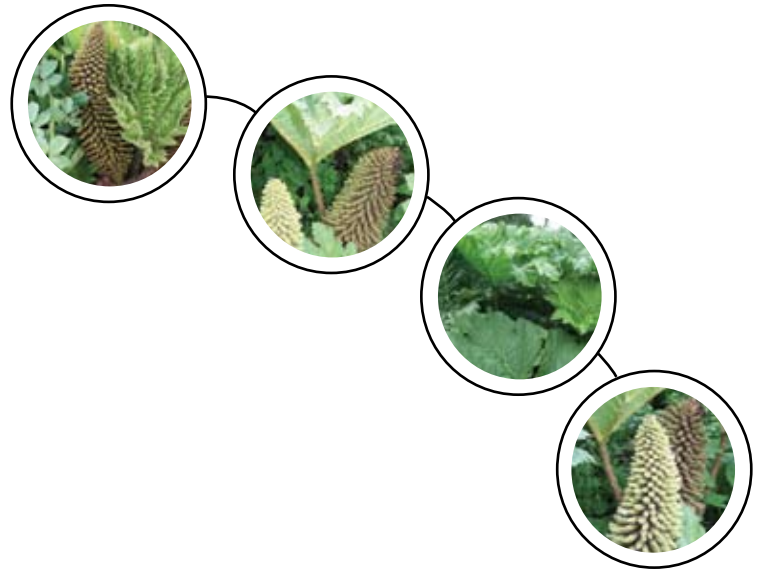


Photos by Alan Cullagh (SRFB)

## *Giant Rhubarb - Gunnera tinctoria*



Giant rhubarb is a large plant resembling the common rhubarb that dies back at the end of the growing season (Autumn). It can be found on boggy ground, damp pastures, in ditches, on roadsides, by streams, river banks and on cliff faces. It has large umbrella sized leaves growing to around 2m in height. Once established, giant rhubarb is highly invasive and grows in dense clumps that shade out native flora.



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Photos by Joe Caffrey (CFB) and John Early (NIEA)

## Hottentot Fig - *Carpobrotus edulis*



Hottentot fig is an introduced species, native to South Africa. It grows quickly, forming dense mats that can carpet cliff slopes, shading out other native species. It easily spreads by seed (hundreds per fruit) and from segmentation (any shoot segment can produce roots). Its succulent foliage, bright pink or yellow flowers, and resistance to some harsh coastal climatic conditions (salt) have made it well adapted for life on the coast in Ireland.



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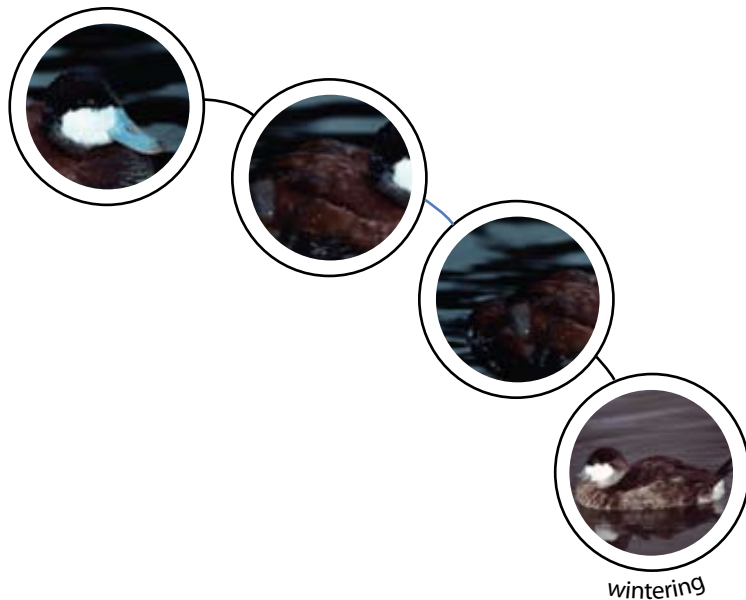


Photos by Richard Weyl (NIEA)

## Ruddy Duck - *Oxyura jamaicensis*



The ruddy duck is an introduced species from North America. It threatens its close relative, the white-headed duck (*Oxyura leucocephala*). Male ruddy ducks out-compete male white-headed ducks and mate with the females producing hybrids. Where pairs of ruddy ducks occur with white-headed ducks they are more aggressive and can out-compete for nesting space and food. Interbreeding may result in the eventual extinction of the white-headed duck.



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## Common cord grass - *Spartina anglica*



Common cord-grass is a robust grass with shoots that can reach 1.3m, it is spread both vegetatively and by seed. This grass colonises sheltered mud flats at a tidal level below the normal salt marsh vegetation, producing dense monoswards. These swards slow the movement of water and increase the rate of silt deposition, raising the general level of the marsh and blocking out other species from establishing, therefore reducing biodiversity. By forming the dense monoswards on mudflats it reduces the food resources available for wildfowl and wading birds, notably eel-grass beds and invertebrates.



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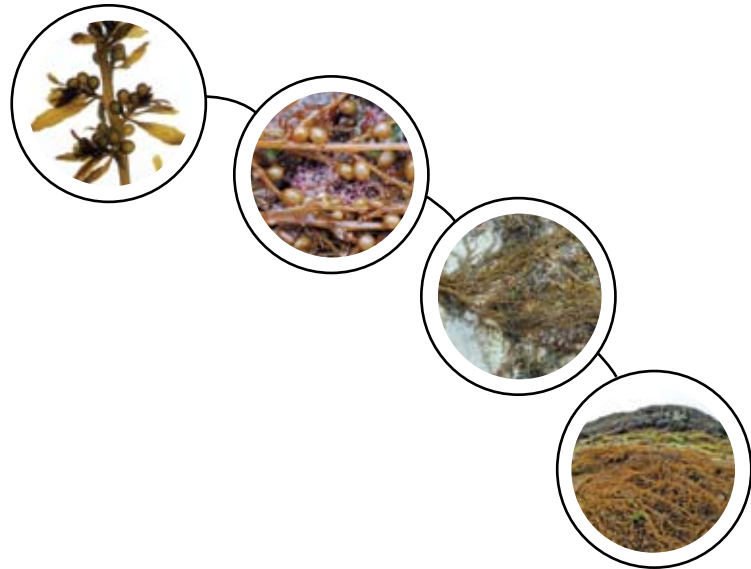
Photos by Mark Hammond and Paul Corbett (NIEA)

## Wire weed - *Sargassum muticum*



This large brown alga is present at several locations around the coast of Ireland. It is believed that this species arrived with oyster spat introduced for commercial purposes. It is known to occur from the intertidal to the subtidal range of substrates including hard rock face and Eel grass beds, where it can form dense stands excluding other species. It can grow up to 16 m in length, forming dense floating mats on the sea surface, growing at a rate of up to 10 cm per day. It reproduces both sexually and via floating fragments.

Dense stands of Wire weed can reduce the available light for understory species, dampen water flow, increase sedimentation rates and reduce ambient nutrient concentrations available for native species. Due to its prolific growth it has become a great nuisance, drifting and clogging marinas, clogging the intake pipes of boats and drifting ashore covering areas of Eel grass, which are an internationally important bird feeding habitat.



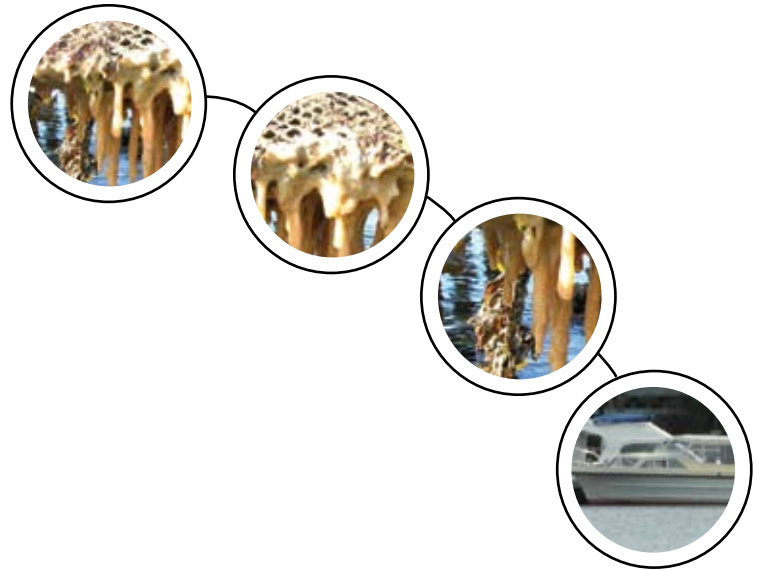
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## *Didemnum vexillum*



*Didemnum vexillum* is a colonial sea squirt that grows in two forms: 1) long candle wax like colonies that hang from any hard surface such as docks, lines and ship hulls; 2) undulating mats that cover and encrust rocky seabeds. This organism can spread by larvae and fragmentation but is mainly transported on boat hulls, fishing equipment and ballast water. Colonisation threatens the aquaculture and fishing industries by interfering with fish egg laying grounds and also smothering bivalves such as mussels, scallops and oysters, other impacts include smothering seaweeds and sponges.



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Photos by Julia Nunn

## The Bloody-red Shrimp - *Hemimysis anomala*

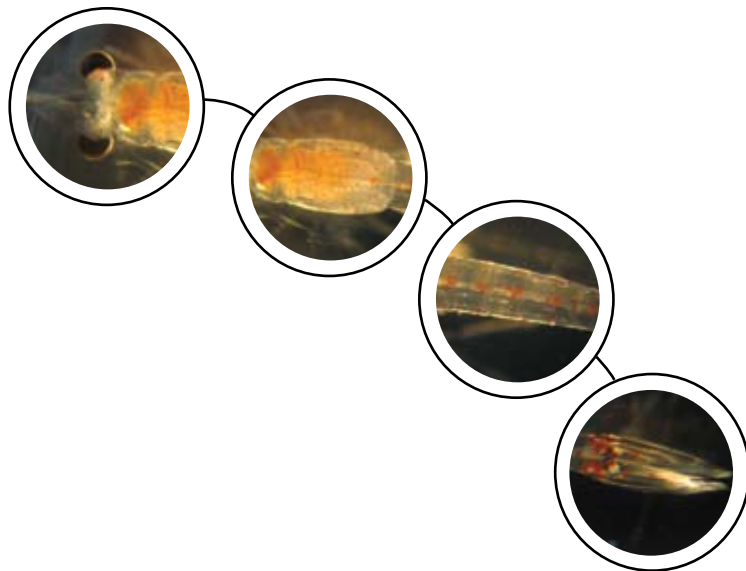


The “bloody-red shrimp” is a recent aquatic invader to Ireland. It is a small, shrimp-like crustacean native to the Black Sea, the Azov Sea and the eastern Caspian Sea.

They are free-swimming and have eight pairs of legs, rather than the five typically found on larger shrimps and other decapods. It has directly eliminated many important macroinvertebrate species from fresh and brackish waters in Holland. Whilst not yet present in

Northern Ireland, it is highly likely to invade via the same route as zebra mussels and rapidly establish in the Erne system with the potential to spread to unconnected waterbodies. In large numbers they can form a distinctive red ‘bloom’ in the water, usually around marinas and jetties.

They are likely to severely impact freshwater food webs due to a large capacity for predation, which may well pose a significant threat to other macroinvertebrates and fish communities such as eel, pollan, lamprey, Arctic char, brown trout and Atlantic salmon.



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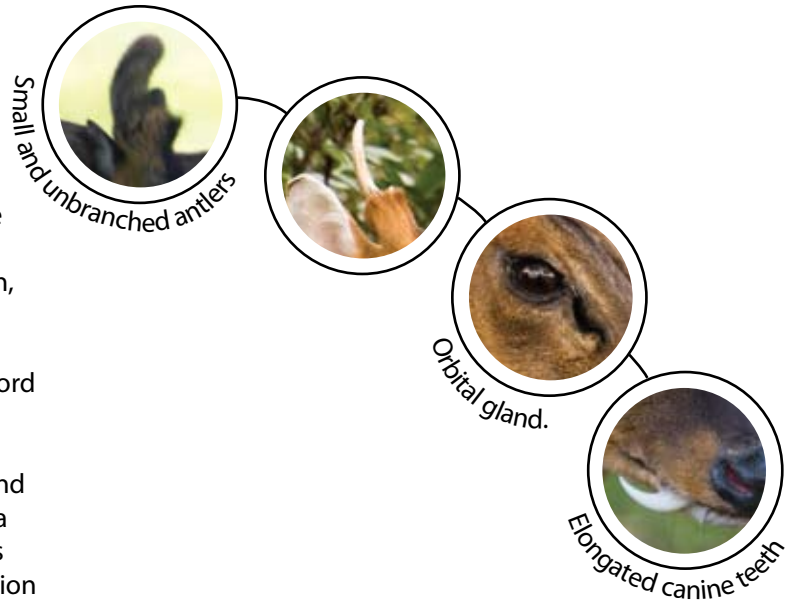
## Muntjac Deer - *Muntiacus reevesi*



Muntjac deer are a highly invasive species causing extensive ecological and economic damage to forestry, crops, biodiversity, species of conservation concern and humans directly.

They originate from South East Asia and are small, roughly around the size of a fox. Adult Muntjac stand approximately 45 cm in height. Males (bucks) are marginally larger than females (does). During the summer months the Muntjac's coat is a reddy-brown colour with very pale, often white, hair under the chin, throat, belly and tail.

Mating can occur at any time of the year. The first record of this species in Ireland occurred during 2007 when an adult buck was shot in the wild in Co. Wicklow. Anecdotal reports of their presence in Northern Ireland have been increasing in frequency and in June 2009 a confirmed sighting occurred when a young buck was killed by vehicle collision in Co. Down. A small population exists on the Ards Peninsula.



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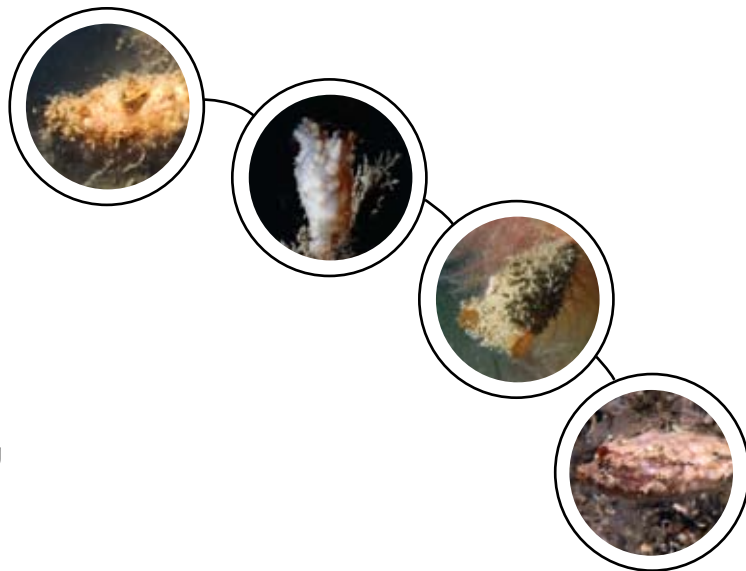
Photos by Steven McDowell (NIEA) and Trevor Bantham (Forestry Commission)

## Leathery Sea Squirt - *Styela clava*



The Leathery Sea Squirt is a competitor for food with other species and is documented as a major fouling pest on ships' hulls and oyster beds. It is found in shallow water on hard surfaces and disperses via planktonic eggs and larvae.

Leathery sea squirts have a long club-shaped body, tapering to a slender and tough stalk. The overall height of the sea squirt can reach 12 cm with a stalk 1/3 of their total length. The surface of the sea squirt can be leathery in appearance, hence their common name, with folds and swellings. The siphons at their top (anterior) end are positioned closely together. Circumstantial evidence suggests it was first transported to the UK on the hulls of warships following the end of the Korean War in 1951. It has since become widely distributed, locations include Cork, Lough Swilly and Fenit Harbours in Ireland. The first sighting in Northern Ireland was in 2008 at Larne Lough.



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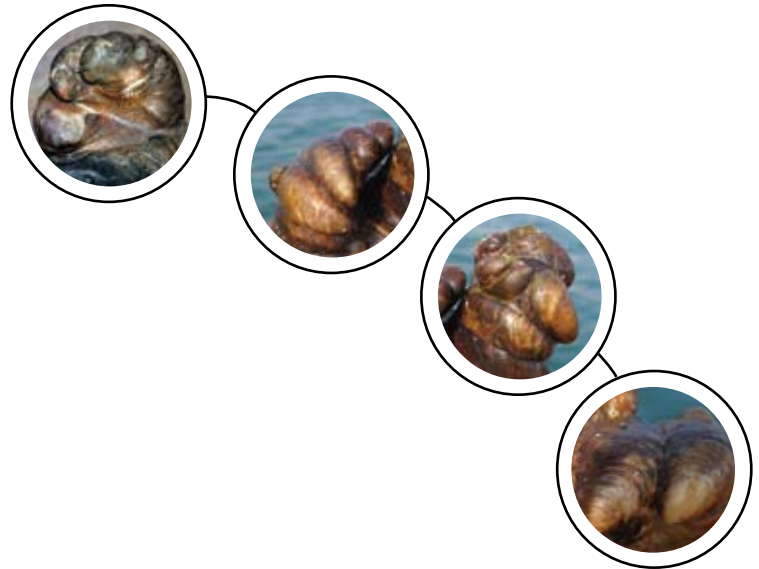
Photos by Keith Hiscock

## Slipper Limpet - *Crepidula fornicate*



The slipper limpet competes with native bivalve molluscs for both space and food, reproducing very rapidly and consequently blanketing whole areas of the sea floor. Slipper limpets are commonly found in curved chains of up to 12 animals. It is a serious threat to the oyster industry due to it forming very high densities (several thousand individuals per m<sup>2</sup>).

The slipper limpet is a native of the east coast of North America but has spread to much of northern Europe. It has also been introduced to Ireland accidentally along with imported oyster spat and was discovered recently in Belfast Lough. Its main pathway of movement is believed to be via the oyster trade but it can also be moved by attachment to boat hulls.



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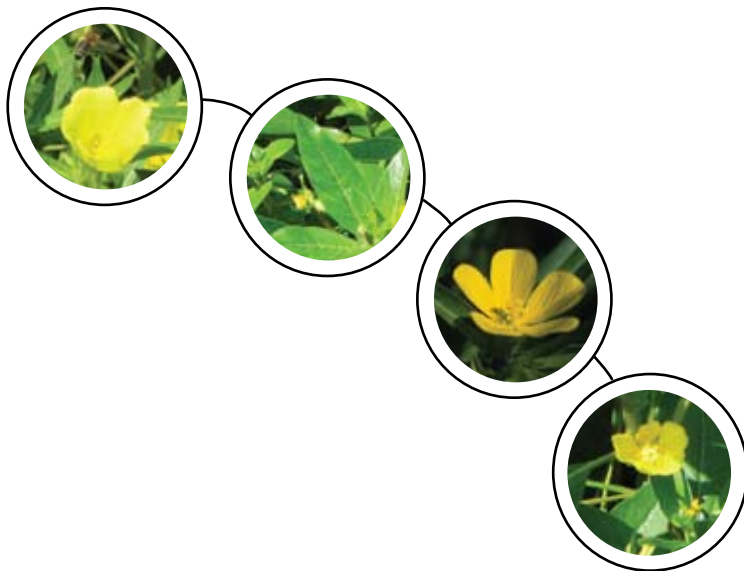


## Water Primrose - *Ludwigia* spp.



Water Primrose is native to South America and some US states. To date it has not been recorded in the wild in Ireland, it has however been recorded in a garden pond in Co.Clare in 2009. It is a vigorous aquatic plant with bright yellow, showy flowers and willow-like leaves. This species has become highly invasive and caused significant economic and environmental damage in many parts of the world including France and is now the subject of control measures in Britain.

The roots and stems grow horizontally from the water's edge. The species can also grow from very small fragments vegetatively allowing new infestations to become established easily.



**Inspect > Remove > Dispose > Report**





Photos by Joseph Ditomaso & IFAS Center for Aquatic Invasive Plants



## This project was Joint funded by:



## Project partnership:





## The Invasive Species in Ireland Project has been supported by:



An Roinn  
Cultúir, Oidhreachta agus Gaeltachta  
Department of  
Culture, Heritage and the Gaeltacht



Comhshool, Pobal agus Rialtas Áitiúil  
Environment, Community and Local Government







## Aknowledgements

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Japanese Knotweed (*Fallopia japonica*)

Giant Hogweed (*Heracleum mantegazzianum*)

Dace (*Leuciscus leuciscus*)

Chub (*Leuciscus cephalus*)

Zebra Mussel (*Dreissena polymorpha*)

Joe Caffrey INVAS

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John Early NIEA & Jonathan Newman CEH

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John Coyne IFI

Joe Caffrey INVAS & NIEA



## Aknowledgements

Chinese Mitten Crab (*Eriocheir sinensis*)

Giant Rhubarb (*Gunnera tinctoria*)

Hottentot Fig (*Carpobrotus edulis*)

Ruddy Duck (*Oxyura jamaicensis*)

Common Cord Grass (*Spartina anglica*)

Wire Weed (*Sargassum muticum*)

*Didemnum vexillum*.

Red Bloody Shrimp (*Hemimysis anomala*)

Muntjac Deer (*Muntiacus reevesi*)

Leathery Sea Squirt (*Styela clava*)

Slipper Limpet (*Crepidula fornicata*)

Water Primrose (*Ludwigia spp.*)

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The second edition of this information booklet was produced in October 2009 by John Early (NIEA), Steven McDowell (NIEA), Claire Toomath (NIEA), Bernard Fitzsimons (NIEA), Kieran Meenan (NIEA) and John Kelly (EnviroCentre) with special thanks to Joe Caffrey and Dan O'Callaghan of the Central Fisheries Board for all their help and input into the design, photography and text of the booklet. It was further updated in May 2018 by Rose Muir NIEA

For more information on any of the species in this booklet or to report any sightings of a non-native invasive species please visit [www.invasivespeciesireland.com](http://www.invasivespeciesireland.com)

This booklet should be cited as:

Early J, McDowell S, Caffrey J, O'Callaghan D, Meenan K, Toomath C, Fitzsimons B, Kelly J (2009) & Muir R A (2018).  
Field Guide to Invasive Species in Ireland. 2<sup>nd</sup> Edition. NIEA

