TEES

Alien Invaders

River Tees Rediscovered

Tees
Alien Invaders

A Guide by
Ben Lamb

This guide has been supported by the River Tees Rediscovered Landscape Partnership, thanks to money raised by National Lottery players and awarded through The National Lottery Heritage Fund.

It was compiled by Ben Lamb,
Tees Rivers Trust
with support from
Groundwork NE & Cumbria

Cover Images: Himalayan Balsam, North American Signal Crayfish, Giant Hogweed (c. John Musham)

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FOREWORD

Groundwork NE & Cumbria works on hundreds of projects every year, helping communities find practical solutions to challenges they face. The River Tees Rediscovered Landscape Partnership, with funding raised by National Lottery players and awarded by The National Lottery Heritage Fund, is an exciting initiative involving a wide range of partners, stretching from Piercebridge to the mouth of the Tees.

Our vision is for the Tees Valley to be renowned for its rich landscape, heritage and culture. We aim to connect people and communities to the built and natural heritage within the Tees Valley, bringing our heritage to life, by offering new ways for people to see, hear, touch and enjoy it. This is one of a series of projects which helps to increase learning about our landscape and its heritage.

We hope you enjoy it!

Lucy Chapman

River Tees Rediscovered Partnership Manager
Groundwork NE & Cumbria

River Tees Rediscovered

Introduction

Invasive Non Native Species - a cold, hostile way to address the thriving collection of plants and animals that are here as a result of innocent, often well-meaning introductions by…well, us and our forebears.

However, let us make no mistake that the spread of invasive plants and animals is wreaking havoc throughout the Tees' natural environment. The American 'tag team' of signal crayfish and grey squirrels outcompeting their native rivals and visiting plague upon them; Himalayan Balsam creating monocultures through woodland and along river banks from Cotherstone to Hartlepool; and New Zealand Pigmy Weed taking over and suffocating ponds in Middlesbrough.

If that were not enough, their spread is impacting on the amenity value the natural environment affords us and turning on us, as if in an act of vengeance for being brought here in the first place. The towering Giant Hogweed with a bleb-inducing sting powerful enough to warrant skin grafts and Japanese Knotweed hammering through building foundations like nature's jigger pick, reducing house and land values.

But still there's more. The world is easy to navigate and our mobility has increased the risk of further introductions. There is therefore a real need to be aware of the risks and take appropriate action.

Melodrama to one side, with the help of many thousands of volunteer hours, The Tees Alien Invaders initiative is co-ordinating efforts to respond to the issue. The initiative has assessed the level of effort and identified actions that need to happen in order to have any chance of controlling the spread and averting the arrival of more INNS. We are at the beginning of a long road and Local Action at a catchment scale is the most likely and positive route to success.

Giant hogweed at its height (John Musham)

2 What are Non Native Species?

Non Native species are animals and plants that have been moved outside of their natural range by human action, whether intentional or not.

What are Invasive Non Native Species?

Invasive non-native species (INNS) are those that have been transported outside of their natural range and that can damage our environment, environmental services, the economy, our health and the way we live. Impacts of INNS are so significant, they are considered to be one of the greatest threats to biodiversity worldwide. They threaten not only the survival of rare native species and damage sensitive ecosystems and habitats, but can, over time, remove even the most common species from an area through aggressive colonisation.

Giant Hogweed (John Musham)

How did they end up in and around the Tees?

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As an island, the UK should be fairly resilient to invasions of non-native species. However, we have a long tradition of travel, trade and adventure and also a deep love of gardening. Many of the species that are now problematic were brought back to the UK by plant collectors, often commissioned by wealthy households with large gardens to fill up and in so doing, get one over on the neighbours. It's easy to see why Giant Hogweed would be an attractive addition to the back of a border. A 5m tall triffid with a spray of white flowers would surely have impressed many a tea-party on the lawn.

However, in the absence of natural predators and pests, species such as hogweed and Himalayan Balsam have thrived and romped un-checked through the countryside. Rivers and streams are great highways for many species as they are efficient seed dispersers, especially in floods.

How did they end up in and around the Tees?

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There are a number of species which pose a greater threat than others in the Tees. The Tees INNS initiative has been working on mapping and controlling these through a variety of methods ranging from mechanical control to the introduction of biological agents. They have been prioritised as they pose the greatest threat to biodiversity of Tees as well as our enjoyment and safety around the river.

Himalayan Balsam (John Musham)

These are described in the next few pages, but are not ranked in any particular order. You may notice that there are no methods described for treating or removing any of the species in the following pages. This is intentional and is due to restrictions and hazards based around using herbicides and pesticides as well as the ever-changing laws on what can be used. We highly recommend contacting the Tees Rivers Trust, your Local Authority or a specialist contractor if you would like advice and further information about any of the species listed.

Japanese Knotweed (Fallopia japonica)

Barnard Castle is the furthest upstream in the catchment this invasive plant has been found to date and Broughton Bank on the Leven the most Southerly. This plant does not set seed in the UK and new colonies are formed by movement of plant fragments. These can be along water courses, through the movement of plant debris in soil and on vehicles, dumped garden waste and by well-meaning people trying to remove the plants by cutting and digging.

It forms dense thickets which can exclude native plants and prohibits regeneration. Dense growth of Japanese knotweed can also hinder access, reduce biodiversity and alter the habitat for wildlife. It is also known to damage manmade structures and materials and the rhizomes are capable of entering underground sewers, drains and land-drains through the smallest of cracks or gaps. If small sections of the rhizome then break off, this will allow the plant to spread large distances through the network.

Clockwise from left: Young shoots in Feb/Mar; flower in Aug/Sep; Leaves of mature plant; typical stand of Japanese knotweed. Credit: GBNNSS Crown Copywrite 2009

NOTES

- Look for early emergence in Feb to March
- If on public land, notify your local council. If on private land contact Tees Rivers Trust or specialist contractor for advice.
- DO NOT STRIM. This will spread the plant.
- DO NOT DUMP. This will spread the plant.
- For further info see https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=369

Giant Hogweed (Heracleum mantegazzianum)
An incredibly statuesque yet troublesome plant, this is widespread within the catchment; however, its uppermost presence is below Winston in County Durham. It spreads through seed dispersal and the movement of soil contaminated by its seeds.

Giant hogweed out-competes native vegetation for space and resources, and can result in a loss of plant and invertebrate diversity. Dense stands can hinder access. Winter dieback exposes soil to erosion with loss of river banks and increased sedimentation. Seeds are viable for up to 21 years, which means that seeds too lowdown in the soil to germinate which are exposed due to bank-erosion will add to the new stands of plants in the following years.

It is a public health hazard due to the toxins in the sap reacting with UV light to blister skin and care must be taken around it. If you do find yourself stung, wash the area with plenty of clean water, keep out of sunlight and seek medical help.




Clockwise from left: Early stages of flowering; a young leaf in March; a stand of treated hogweed; 'guerilla' grazers attacking hogweed. Credit: Tees Rivers Trust.

NOTES
- Look for early emergence in March
- If on public land, notify your local council. If on private land contact Tees Rivers Trust or specialist contractor for advice.
- DO NOT TOUCH with bare skin
- For further info see http://www.nonnativespecies.org/downloadDocument.cfm?id=30

Himalayan Balsam (Impatiens glandulifera)

Himalayan Balsam is an annual plant. It prefers moist soils but will grow anywhere. Himalayan Balsam grows up to 3 m tall and is the tallest annual plant found in the UK. This is widespread throughout the catchment and is easy to spot when the mass of pink 'policemans helmet' flowers appear from late June to late September.

Cotherstone is the highest point in the river system that this plant has been reported. Its seeds are spread through natural dispersion by exploding (dehiscent) seed pods, which can eject the seeds over several meters and via water from areas in which it has been introduced through the transport of contaminated soil.

It forms thick monocrop stands that can shade out low level native plants reducing biodiversity and denuding river banks of understory vegetation. When the plants die down in winter they leave large bare areas that are sensitive to erosion, particularly along the banks of rivers and streams

Clockwise from left: Young shoots in Mar/Apr; flower in July/ August; stem of mature plant; close up of flower.
Credit: GBNNSS Crown Copyright 2009

NOTES

- Look for early emergence in March.
- If pulling balsam from the garden, ensure it is uprooted and left in place to rot.
- DON'T put in bin
- It is an offense to spread this plant.
- For further info see: http://www.nonnativespecies.org/downloadDocument.cfm?id=33

American Signal Crayfish (Pacifastacus leniusculus)

Originally introduced in the UK for the dinner table, North American Signal Crayfish have reached epidemic proportions within the Tees catchment area and have been found as far up the river as Middleton in Teesdale. Signal Crayfish are much larger and aggressive than the native crayfish. They prey on the native crayfish, out-competing them for food and seriously damage river habitats and native fish populations.

The Signal Crayfish also carry the crayfish plague (Aphanomyces astaci). The plague, harmless to the host, is deadly to our native species. It is estimated that up to 95% of White Clawed Crayfish have been lost nationally. Only a handful of populations of Whiteclaw now exist in the Tees.

Clockwise from left: Adult signal crayfish (Top l&r), note red underside of pincer; juvenile signal crayfish; native white-clawed crayfish.

NOTES

- A licence is required from the Environment Agency to fish for this species;
- Crayfish plague is easily transported on wet gear and if it reaches a population of whiteclaw crayfish, will potentially devastate them rapidly.
- Remember to Check Clean and Dry any wet gear.
- For further info see: http://www.nonnativespecies.org/downloadDocument.cfm?id=68

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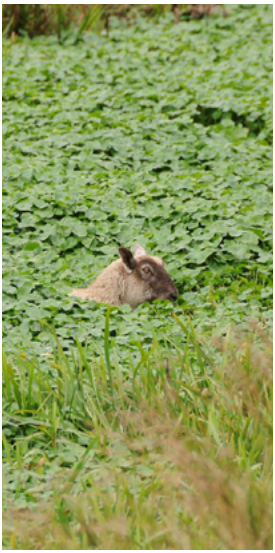
Floating Pennywort (Hydrocotyle Ranunculoidese)

This invasive species is present on a small number of sites in the lower stretches of the catchment. The main sites are near Infinity Bridge and Trinity Mews in Stockton on Tees.

Once introduced into the wild, this plant can grow up to 20cm a day and can quickly dominate a water body, forming thick mats which can impede water flow and amenity use. It out competes native species by blocking out sunlight and causing deoxygenation.



Clockwise from left: Pennywort plant and rooting nodes; an infested watercourse; a sheep stuck in a bog of pennywort
Credit: GBNNSS and Trevor Renals

NOTES

- Can spread from a single node.
- If present in your pond, be careful when clearing and if possible leave to rot on pond side or in compost.
- Do not stock if you have a new pond, find an alternative.
- For further info see: https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=31

New Zealand Pygmy Weed (Crassula helmsii)

This plant was introduced in 1911 as an oxygenating plant for ponds and, since the 1970s, has spread rapidly. It is present in a number of ponds around the Tees catchment and spreads readily, for example on fishing gear, muddy boots and birds' feet.

The plant forms dense mats and can impede drainage, causing flooding. It also displaces other aquatic plant species and reduces amenity use of the waterbody. The most effective way to deal with it is to fill in the infected pond and dig a new one. However on larger ponds and lakes, this is obviously not such an easy proposition.

Clockwise from left: Flowering plant; growing in wet ground as a marginal; pond proliferation; demonstrates size of plant.
Credit: GBNNSS and Trevor Renals.

NOTES

- Do not stock into new ponds
- Dispose of cleared pond waste by rotting or composting
- Check, clean and dry boots, equipment and dogs if you have been near an infected area.
- For further info see: https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=360

Chinese Mitten Crab (Eriocheir sinensis)

This is a species which we are fairly sure is in the Tees but have thankfully not yet found. These crabs get their name from their large, 'hairy' claws and have been established in the River Thames since the 1930s, most likely introduced by boats offloading ballast water in UK docks which was picked up elsewhere. Within the northeast of England they have been recorded in the rivers Tyne, Ouse and Humber.

Research carried out by the University of Newcastle upon Tyne in 2004 (L.-M. Herborg et.al.) showed that the progression of this invasive species, up the eastern coastline of England, to be in excess of 78Km per year. It is therefore reasonable to conclude that Chinese Mitten Crabs could be present within the Tees catchment. We continue to monitor for them with the help of PD Ports.

Clockwise from left: Adult mitten crab carapace approx. 8cm wide; burrows cause bank collapse and erosion; hairy claw and feathered leg make the species easily identifiable.
Credit The Food and Environment Research Agency (Fera)

NOTES

- If found eg. during bait collecting, please take a photo and report to Tees Rivers Trust.
- If found, do not return to water.
- For further info see: https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=367

Biosecurity Threats

Potential Invasive Non-Native Species Biosecurity Issues

Swathes of Purple Balsam along riverbanks and acres of gargantuan Giant Hogweed stand as a good warning that once Pandora has opened her box, it's almost impossible to get it shut again! Keeping the lid on the box is a challenge and one which we are working hard on by way of improving bio-security and horizon scanning for the species which pose the greatest risk. By being aware and acting early if they are seen, we have a better chance of controlling and eradicating new species before they get a foothold in the wild.

The INNS listed below are currently not known to be present in the Tees catchment area. However, they have been classified High Level Threats due to their likely impact on biodiversity and the local economy in combination with the likelihood of their introduction. The level of risk of introduction is based on the pathways for the introduction of INNS, their current geographic proximity and their potential uses (e.g. food in restaurant trade, horticultural trade and aquatics trade).

If you see any of these species, please make sure you act quickly and contact the GBINNS Secretariat, the Tees Rivers Trust, The Environment Agency or Natural England.

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Killer Shrimp (Dikerogammarus villosus)

This is a highly invasive freshwater shrimp. It can be considerably larger than our native shrimps, growing up to 30mm in length and usually has a striped appearance, although it can be uniform in colour. The species is listed in the Top 100 worst alien species in Europe.

Killer Shrimps are omnivorous, able to exploit a wide food base including macroalgae and microalgae (from cleaning stones and through filter feeding), all invertebrates (including fast moving species), fish eggs and fish fry.

Environment Agency research discovered that Killer Shrimp can survive for up to 5 days on a damp fishing net. In a second study, in cooler weather conditions, they established that survival on a damp folded net was possible for 7 days, in a small plastic crevice they survived for 10 days and within a crease of a damp folded wader, killer shrimp survived for 15 days. This demonstrates the importance of river users to **check, clean** and **dry** equipment and clothing.

Clockwise from left: Adult Shrimp compared with 20p piece; life stages of shrimp; close up of adult shrimp.
Credit: Environment Agency

NOTES

- Make sure you carefully CHECK CLEAN AND DRY any equipment that has been in water where this species is present. Visit GBNNSS for map of known locations.
- If you do find this species in the Tees, please notify the Environment Agency immediately by calling 0800 80 70 60
- For further info see: https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=474

Water Primrose (Ludwigia grandiflora)

The leaf shape of the Water Primrose can vary from round to egg shaped or long and slender. However, the yellow flowers are the same on each plant. Although quite distinctive in its floating form, more care is needed to distinguish it from other species when it is growing in the margins of water bodies. It is best searched for when in flower (July to August). Water Primrose spreads primarily by plant fragmentation but can also spread by seeds.

Water Primrose forms dense rafts in slow moving waters and out-competes other native plant species. Once established, the rafts reduce light levels below them and can cause die-off of other water plants and algae and reduce water oxygenation levels killing fish and other fauna. In large quantities, Water Primrose can block water bodies and drainage systems and may lead to an increased risk of flooding. It can also impede bathing and boating activities.

Clockwise from left: Adult plant flowering; early growth mar/apr; later growth May/Jun; invaded and choked waterway

NOTES

- Do not stock into ponds
- For further info see: https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=861

Zebra Mussel (Dreissena polymorpha)

Zebra Mussels are a freshwater species that grow on average up to 30 mm long. They have striped shells similar to a zebra's stripes, which is how they get their name. Zebra Mussels have sticky byssal threads that they use to attach tightly to any hard surface and they can live for four to five years. In order to strain plankton out of the water column for food, each Zebra Mussel filters up to a litre of water per day. This puts them in direct competition with native fish.

In addition to the impact on wildlife, Zebra Mussels cause many problems. They may colonise water intake pipes, severely restricting the water flow to power plants or other municipal or private facilities that rely on fresh water. Zebra Mussels will attach to almost any hard surface, either natural or manmade. On boats, they may attach to the hull, motor, or any item immersed in the water. Both large and small boats can be severely impacted by increased drag caused by thousands of mussels. Small Zebra Mussels may get into engine cooling systems, causing overheating and other damage.

Zebra Mussels also pose a threat to navigational buoys, piers, docks, and other structures in the water. Navigational buoys have been sunk under the weight of attached zebra mussels. Wood, steel, and concrete are all damaged by prolonged attachment of the mussels.

Clockwise from left: Juvenile mussels, note distinct markings; attached to an engine shaft; adult mussel; invaded foreshore. Credit: GBNNSS

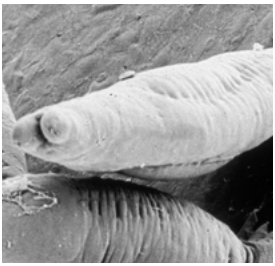
Salmon Fluke (Gyrodactylus salaris)

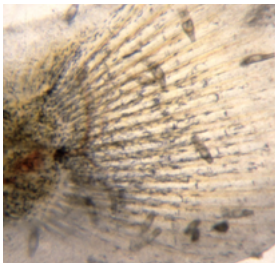
This is a parasite which infects the skin, gills and fins of salmon, trout and other types of fish in fresh water. It is an incredible organism in that it has the capability to reproduce on its own, giving birth to live offspring which already contain live future generations of the species – a fatal Russian doll.

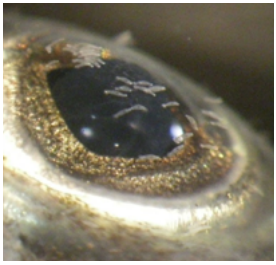
The effects of the disease are so serious that salmon stocks have now been lost completely from more than 20 Norwegian rivers, with the particular races of salmon in these affected rivers being lost forever.

Gyrodactylus Salaris does not occur in UK rivers, but experiments carried out in Norway have shown that our salmon, like those of Norway, are easily infected by the parasite. The UK is recognised as being GS free and therefore imposes controls on live fish movements from infected countries. Other potential avenues of introduction include, through contaminated angling equipment, clothing, fish bait and water vessels entering a non-affected area from one that is.

It is therefore very important that the Check, Clean and Dry principles are adhered to in order to reduce the chance of this parasite being introduced into the UK.







Clockwise from left: Close up of G Salaris; infested tail of juvenile salmonid; colour close up of G Salaris; infested eye of juvenile salmon. Credits: Tor Atle Mo/NINA Jannicke Wiik-Nielsen, Science photo library: Raúl Ramírez, NHM

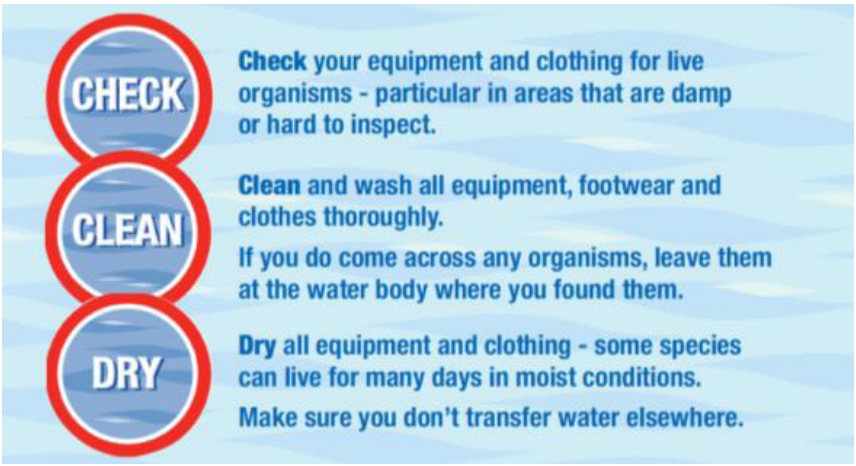
NOTES

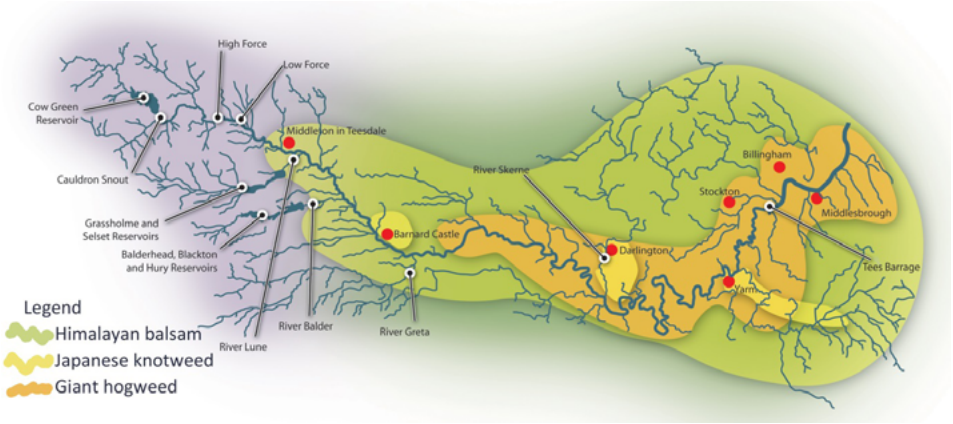
- For further info see: https://www2.gov.scot/Topics/marine/Fish-Shellfish/aquaculture/diseases/notifiableDisease/g-salaris

6 How you can help in the battle against Alien Invaders

There have been a number of references to Check, Clean and Dry throughout this booklet. This is a simple message that we ask everyone who has been in and around the water to think about before they move on. The campaign has been developed by the DEFRA GB inns Secretariat and more information about it can be found at this link: www.nonnativespecies.org/checkcleandry

All you need to do is…





Distribution map of 'the big 3' in the Tees.

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GROUNDWORK
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