

An introduction to Invasive and Non-native Species (INNS)?

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and LINNSI LAG lead)

What are the aims of today?

- Identification features of key INNS
- The impact of INNS
- How they are spread?
- Local & National policy
- Management Techniques (examples)
- Understanding biosecurity & best practise
- Recording & monitoring INNS
- What you can do to help?

What are Invasive Non-native Species?



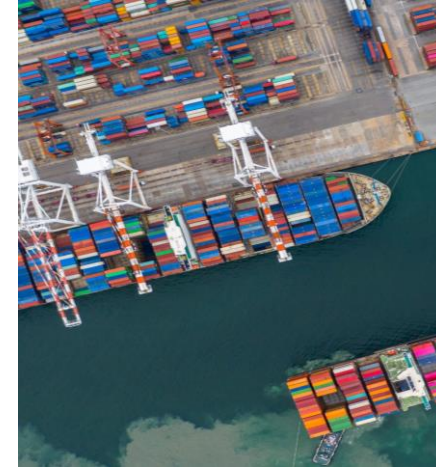
What are INNS?



10,000 years ago



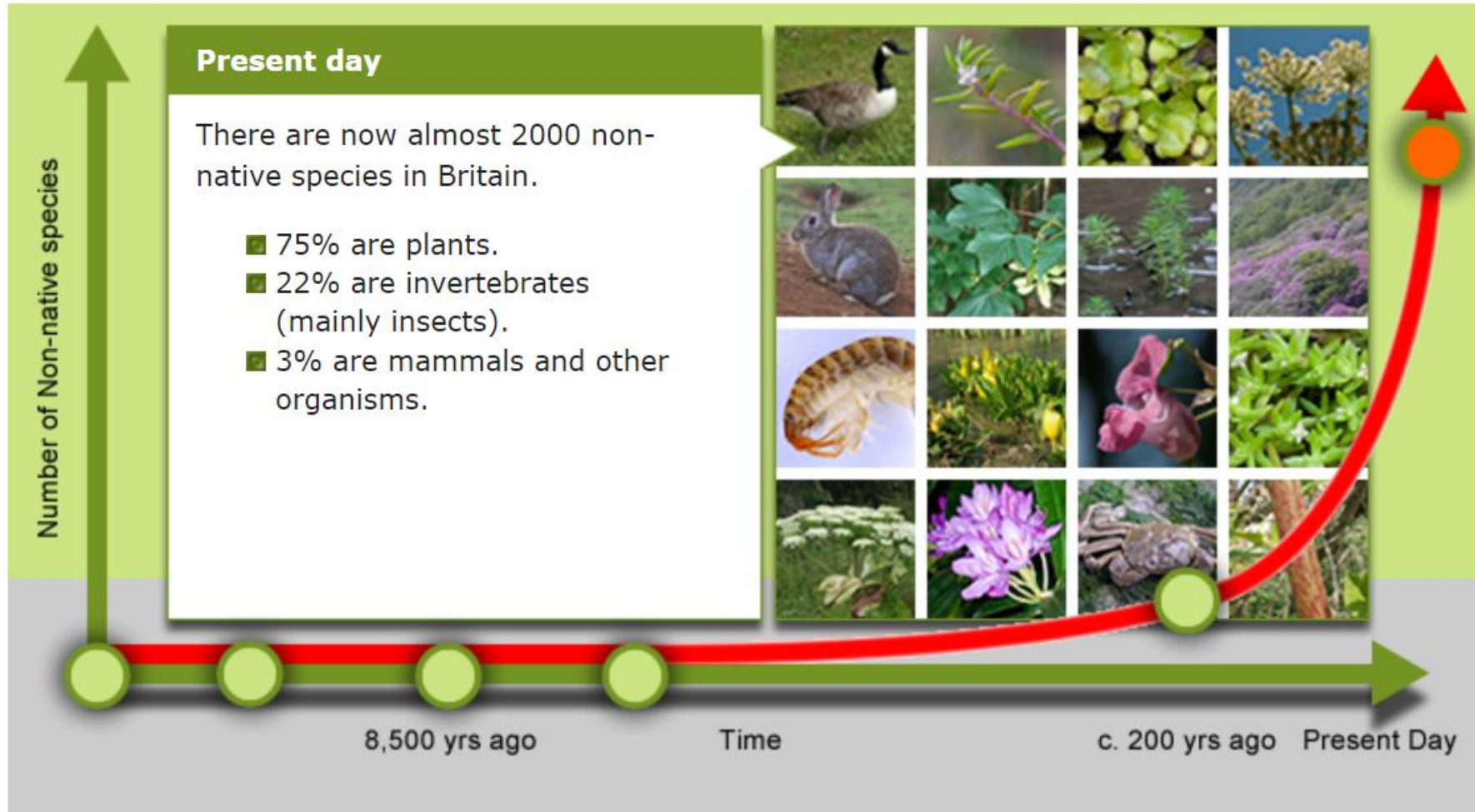
8500 years ago



200 years ago

- Invasive Non-Native Species are introduced species which have a negative impact upon our native ecosystem.
- 10/12 New INNS will become established in the UK each year!

What are INNS?



Definitions

A non-native species is a plant/animal that has been transported outside of its native range by people, either accidentally, and/or deliberately (approx. 8,000 years ago when humans arrived in the UK).

However, the term 'invasive' refers to those which are capable of environmental disruption in the places where they establish.

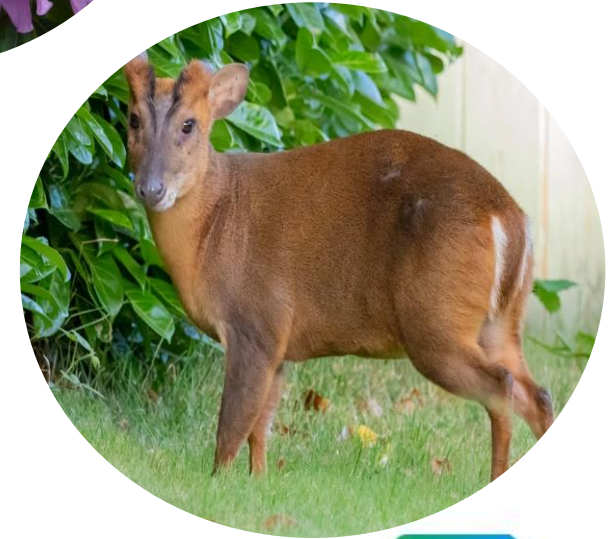
Invasive species cause a host of serious problems, causing damage & harm too:

- **Wildlife, ecosystems & the natural environment**
- **Economy & built environment**

A non-native species is a plant/animal that has been transported outside of its native range by people, either accidentally, and/or deliberately (approx. 8,000 years ago when humans arrived in the UK)

- **Around 2000 NNS in the UK currently, with 10-15% of species becoming invasive** and having an detrimental affect.

Common INNS associated with Golf Course grounds



Native VS Non-native?

Horse-chestnut Tree



-S-E Europe
-1500s
-Not considered invasive as no negative impact

Water Vole



-Native species
-Mink biggest threat

Grey Squirrel



-North America
-1876

Collard Dove



-Native
-More recently colonised via natural dispersal

Links to Policies & Strategies

Plans & Strategies (examples)

The threat posed by INNS is increasingly recognised in international, national and local policy and planning framework, below are a few **examples**:

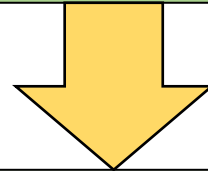
1. **Leicester BAP 2021/31** – key strategic aim to reduce prevalence of INNS by 50% during this time
2. The Leicester City BAP
3. The **Convention on Biological Diversity** is a major driver for national strategies on INNS;
4. The UK has international obligations to address INNS issues, principally through the **WFD, the EU IAS Alien species Regulation (EC 1143/2014), the EU Habitats10 and Birds Directives etc**
5. INNS are also contributing to **WFD failures and increasing flood risk.**
6. Leicestershire County Council '**Action for Nature**' **strategic plan & 'Environment Strategy'**
7. **Local Nature Recovery** with INNs control actions included via new stewardship options
8. **Statutory Duty**
9. **Catchment plans**
10. **25 Year Environment Plan**



Non-native Species Secretariat (NNSS)

GB co-ordination

GB Coordination involves the GB Non-native Species Coordinating Mechanism, which consists of a **Programme Board, Secretariat, Risk Analysis Panel, Stakeholder Forum and Working Groups**. The Programme Board and key stakeholders interact via working groups and the annual stakeholder forum; this is facilitated by the Secretariat and its website.



About NNSS

The **Non-native Species Secretariat** has responsibility for helping to **coordinate the approach to invasive non-native species in Great Britain**. They are responsible to a Programme Board which **represents the relevant governments and agencies of England, Scotland and Wales**.



Supporting Local Action Groups (LAGS)

The Leicestershire & Rutland Invasive and Non-native Species Initiative (LINNSI)- Local Action Group (LAG)



Aim of the LINNSI LAG

‘To develop and maintain cost-effective strategic approaches to prevent, detect, control, and eradicate specified priority INNS in Leicestershire & Rutland including the associated water catchments through coordinated action of river catchment partnerships and via the implementation of the LINNSI local strategic action plan.

This strategy is a first step to set out and implement such an approach at a multi-catchment scale for INNS that significantly impact the aquatic and riparian environment across Leicestershire & Rutland.’

Responding to invasive non-native species

Once they are established invasive non-native species can be difficult to manage. The best thing we can do is:

- **Prevent them from establishing.**
- **Detect and rapidly respond to them if they arrive.**
- **Manage and reduce the impacts of species that become well established**



PREVENTION

It is easier, and more cost-effective, to prevent a species from establishing, than managing once it is here.

“Prevention is better than a cure”



DETECTION & RAPID RESPONSE

If an INNS does arrive we need to detect and report it as soon as possible. By doing this at an early stage of invasion, we should be able to stop it from developing into a more costly and serious problem.

How do they
impact us?

Impacts of Invasive Non-native Species (INNS)

Invasive non-native species are considered to be one of the **biggest threats to biodiversity worldwide.**

- *A key factor in **54% of known animal extinctions** around the world. Some of their most severe impacts **are on small islands**, where many of the world's most endangered species are found.*
- ***95% of all bird extinctions have been on islands**, most of these caused by invasive non-native species.*

In Britain, invasive non-native species threaten the survival of native wildlife (such as the Red Squirrel, Water Vole and White-clawed Crayfish), spread harmful diseases and damage our natural ecosystems.



How do they impact us?



Ecological

They are one of the greatest threats to biodiversity worldwide - even more than pollution.



Health & Social Well-being

They can also affect our health and the way we live.

Some species such as Floating Pennywort can exacerbate flooding.

Others are a health hazard, such as Giant Hogweed, and Oak Processionary Moth



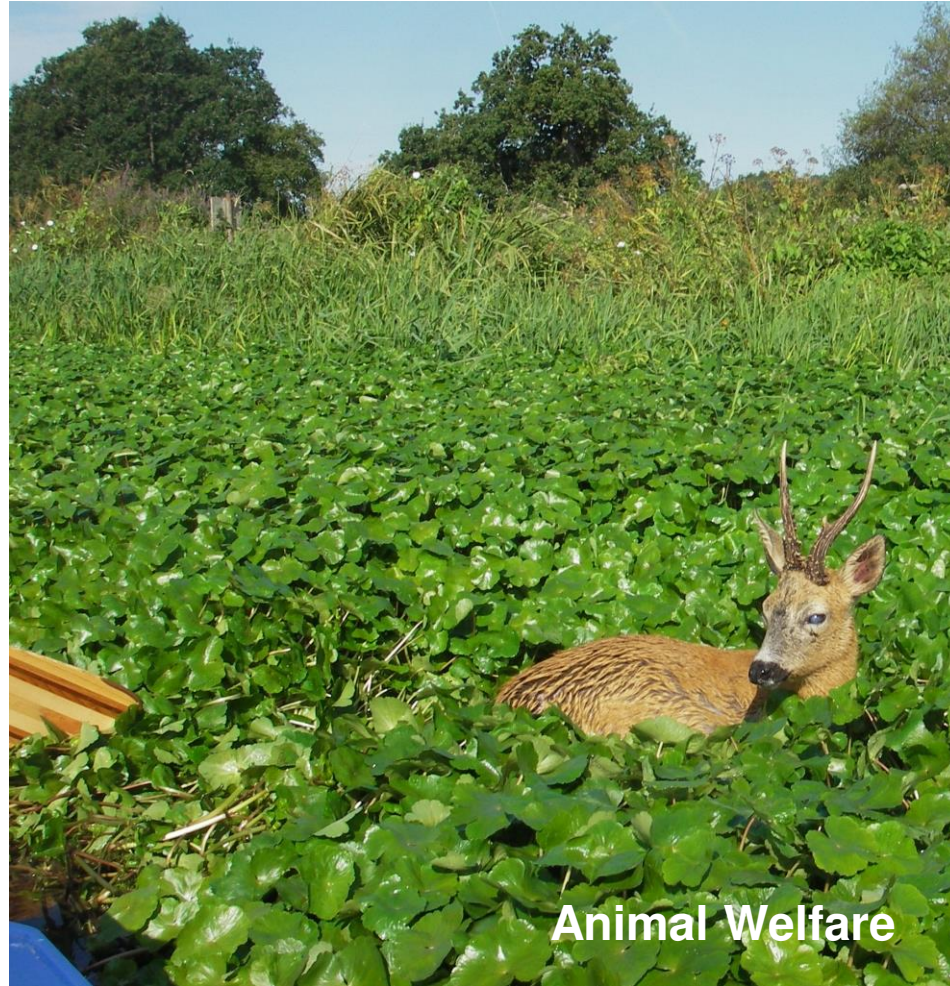
Economic

They cost at least £1.7 billion every year in Britain

Impacts (e.g. Floating Pennywort)



Restricted Access and Navigation for Paddlers



Animal Welfare

Impacts (e.g. Floating Pennywort)

See the photo of the River Mole taken in December 2021 – Can you see the water?

This is how bad Floating Pennywort can dominate catchments if left unmanaged!



Example of Floating Pennywort Growth

FP can grow 20cm a day under the right conditions.



River Wey Navigation, Surrey

• 08 June



• 29 June



• 06 July



• 26 July



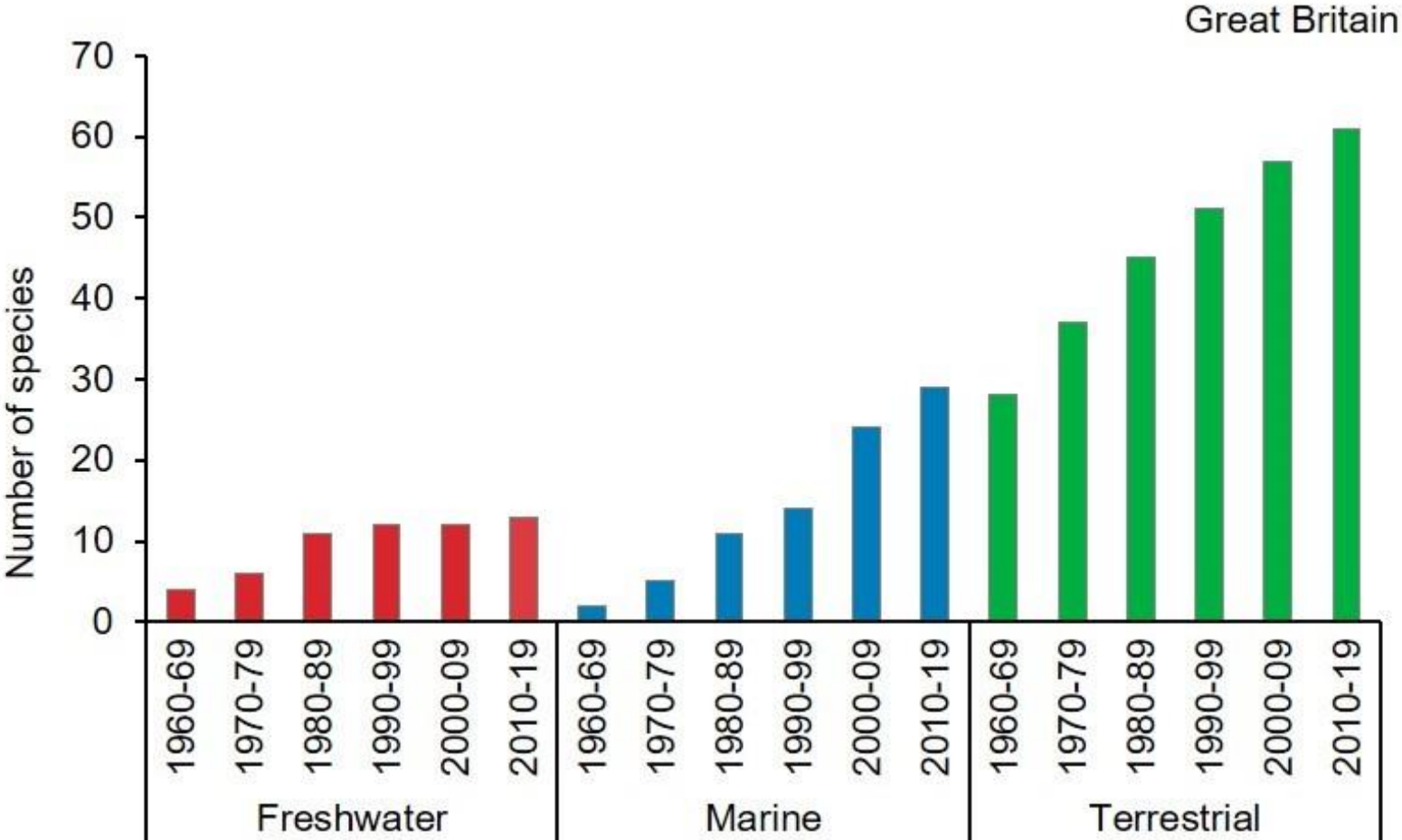
• 10 August



• 09 September



INNS trends in GB (1960-2019)



The UK Government/JNCC Biodiversity Indicator B6: Of **193 INNS established in GB** and damaging biodiversity, the **graph shows number of those species established in or along 10% or more of Great Britain's land area or coastline, 1960 to 2019** (www.wcl.org.uk)

Ecological Impact (examples)

The American Mink

- The American **Mink** was introduced to Britain in **1929** for **fur farming** and was **widespread by the late 20th Century**.
- Mink are **predators** of a variety of species, including **fish, ground nesting birds and the native protected Water Vole**.
- Recent surveys found that Water Vole sites have **declined as much as 94% since the introduction of Mink**, one of the *most rapid and serious declines of any British wild Mammal during the 20th Century*.



The impact of Grey Squirrels



Researchers estimate that 15% of broadleaf trees and 5% of conifers are damaged or killed by grey squirrels.

Fewer than 287,000 red squirrels remain in the UK (Red Squirrel Survival Trust)



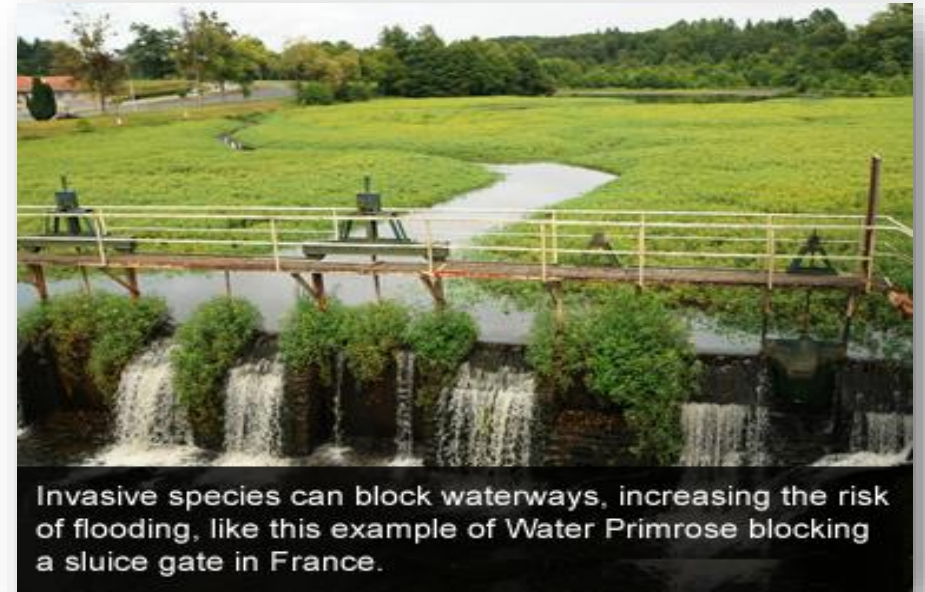
The cost of squirrel damage in terms of lost timber is estimated at between £6 and £10million a year and does not take into account the cost of carbon sequestration or replacing dead and damaged trees, which increases the cost to at least £37 million a year

Health & well-being examples

Invasive non-native species can have a significant impact on the way we live, for example by:

- Harming human health.
- Creating a nuisance.
- Increasing the risk of flooding.
- Reducing our enjoyment of natural areas.

Giant Hogweed burns- The sap of Giant Hogweed contains compounds that, after exposure to sunlight, cause painful blistering to human skin.



Invasive species can block waterways, increasing the risk of flooding, like this example of Water Primrose blocking a sluice gate in France.

Increasing flood risk- Clogging water courses with plant material or by increasing the rate of erosion of the riverbank, which leads to a build-up of sediment.

Economic Impact (examples)

- **INNS cost at least £1.7 billion per year to the British economy**, while across the whole of the EU they are estimated to cost at least €12.5 billion per year.
- The costs include **damage to infrastructure, losses to production (e.g. crops), losses to other activities (e.g. tourism and navigation) and they can be very expensive to manage.**

Costs of management

Managing invasive non-native species once they have become established can be very expensive.

- Rhododendron inhibits the growth of neighbouring plants by forming dense stands shading them out, and releasing toxic phenolic compounds. It is also a vector of *Phytophthora spp* which can cause diseases including sudden oak death.
- The annual costs of controlling just 2.5% of the estimated 827,000 ha of Rhododendron in Britain are around £9 million.



Global impact of Invasive Species

IBPES Assessment Report on Invasive Alien Species and their control (2023)

60%

of **global species extinctions** have been caused, solely or alongside other drivers, by invasive alien species

>\$423 billion

is the estimated **global annual costs** of biological invasions in 2019.

85%

of impacts on **nature and good quality of life** are **negative**

80%

of impacts on **nature's contributions to people** are **negative**

How are they spread?



Putting your kayak in the river

Walking in the woods



Dip netting in a pond

Driving your vehicle on a site



How are they introduced and spread?

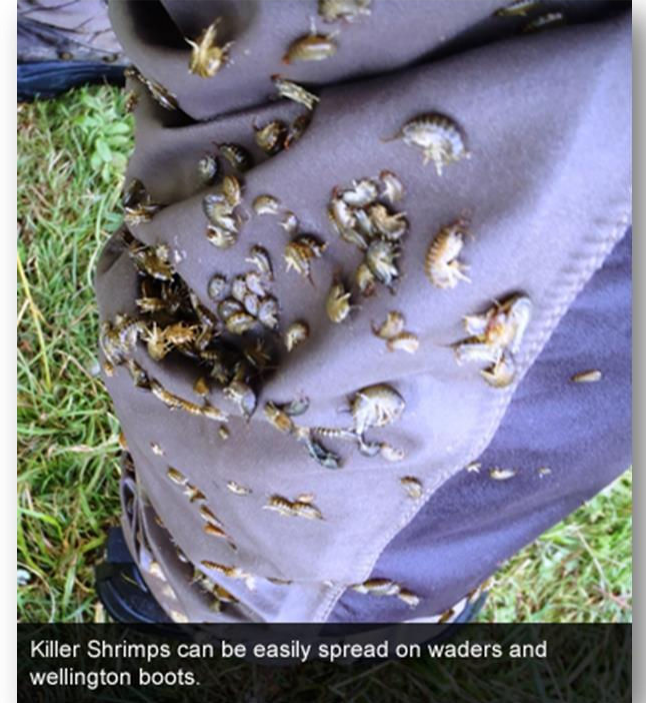
How do they get here?

- Accidental stowaways on ships (e.g. Chinese mitten crab, 1935)
- Ornamental plants
- Exotic pets
- By foot & vehicles
- Equipment (e.g. Killer shrimp, 2010)

Once they have been brought to Britain, invasive non-native species can be spread very easily.

Many produce **large numbers of eggs, young, seeds, spores or fragments** (known as propagules) that are often very **small and sometimes microscopic**. It only takes one of these to start a new invasion.

These propagules can be **spread on equipment, clothing, in the movement of soil or water and through a number of other activities**.



How are they spread?



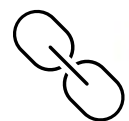
INNS Hotspots on golf courses

- Water features (natural or man-made) e.g. lakes, rivers, ponds, streams, water features etc
- Planted and landscaped areas e.g. planters, borders, baskets, wildflower areas etc
- Hedgerows
- Woodlands, including smaller pockets and trees
- Man-made features e.g. bridges, viaducts, large rocks/stones near water bodies
- Variety of habitats. e.g. heathland, rough grassland etc
- Coastal sites, close to beach shores & tidal areas



Schedule 9 Invasives



 Wildlife and
Countryside Act
1981

Biosecurity

What is biosecurity?

A series of measures or procedures taken to prevent the spread of invasive plants, animals or diseases.

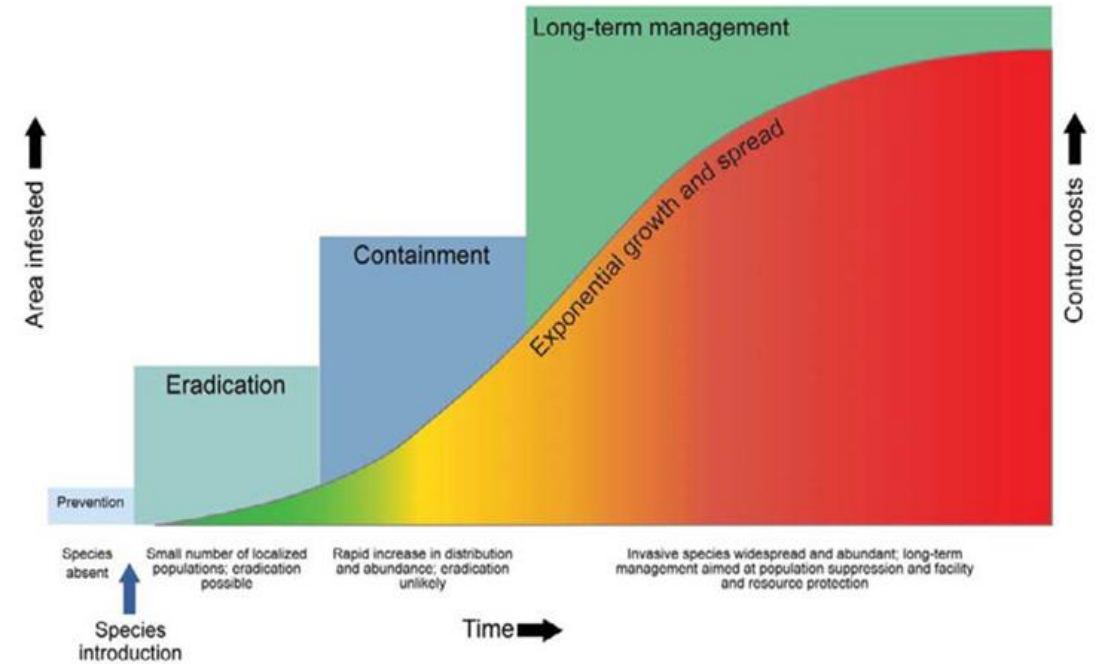
It is **not always possible to see pests and diseases**. Pests are most often transported in soil or organic material, such as plant debris, that can be carried on footwear or by the wheels of vehicles and forest machinery.

Diseases may also be spread via the equipment used for tree work. Some pathogens are dispersed in water.

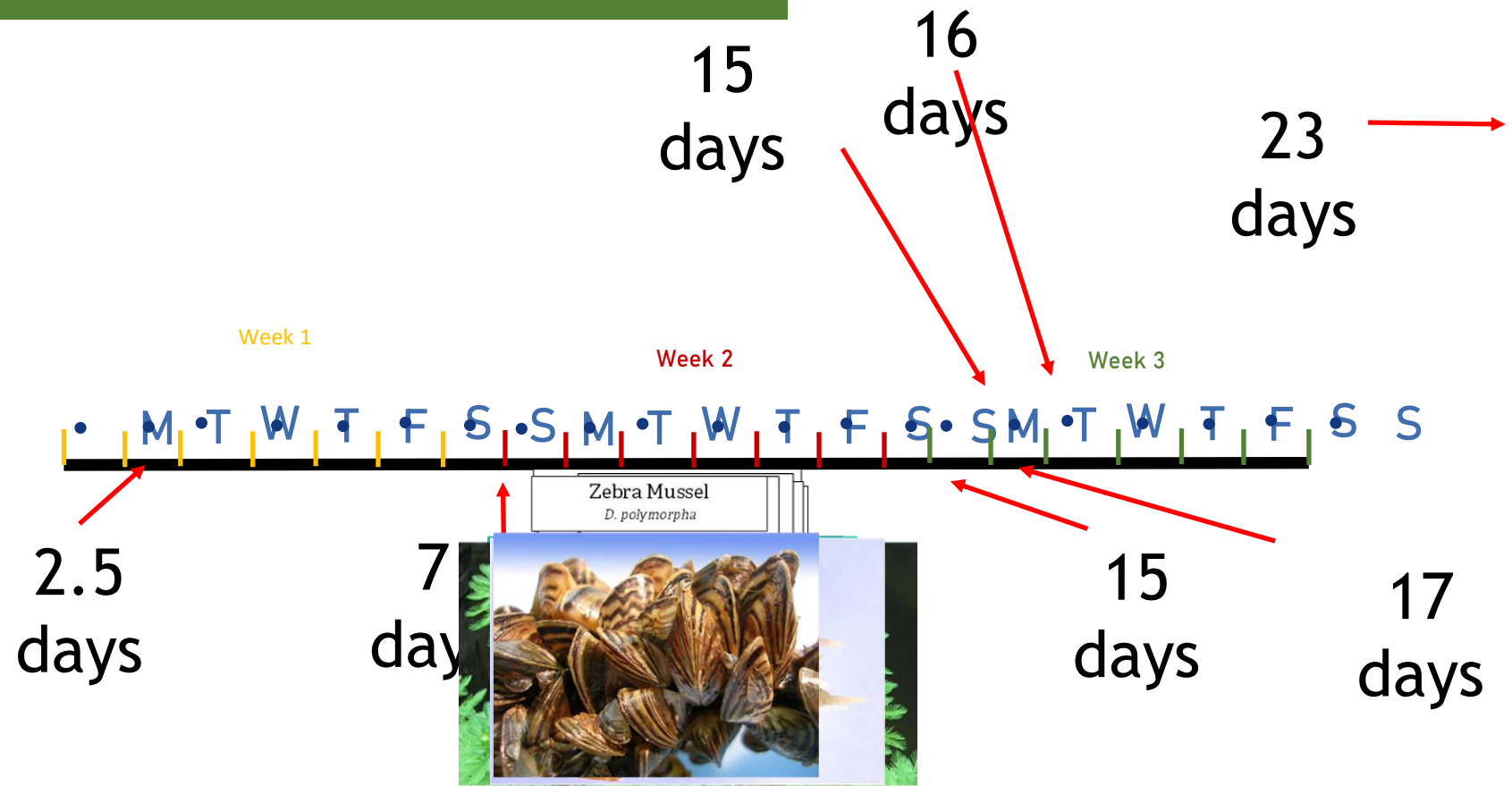


Why is biosecurity important?

- INNS have a major impact on biodiversity.
- INNS can often establish quickly and are able to outcompete native wildlife.
- INNS are often very difficult and costly to eradicate.
- Biosecurity is cheap and easy to implement.



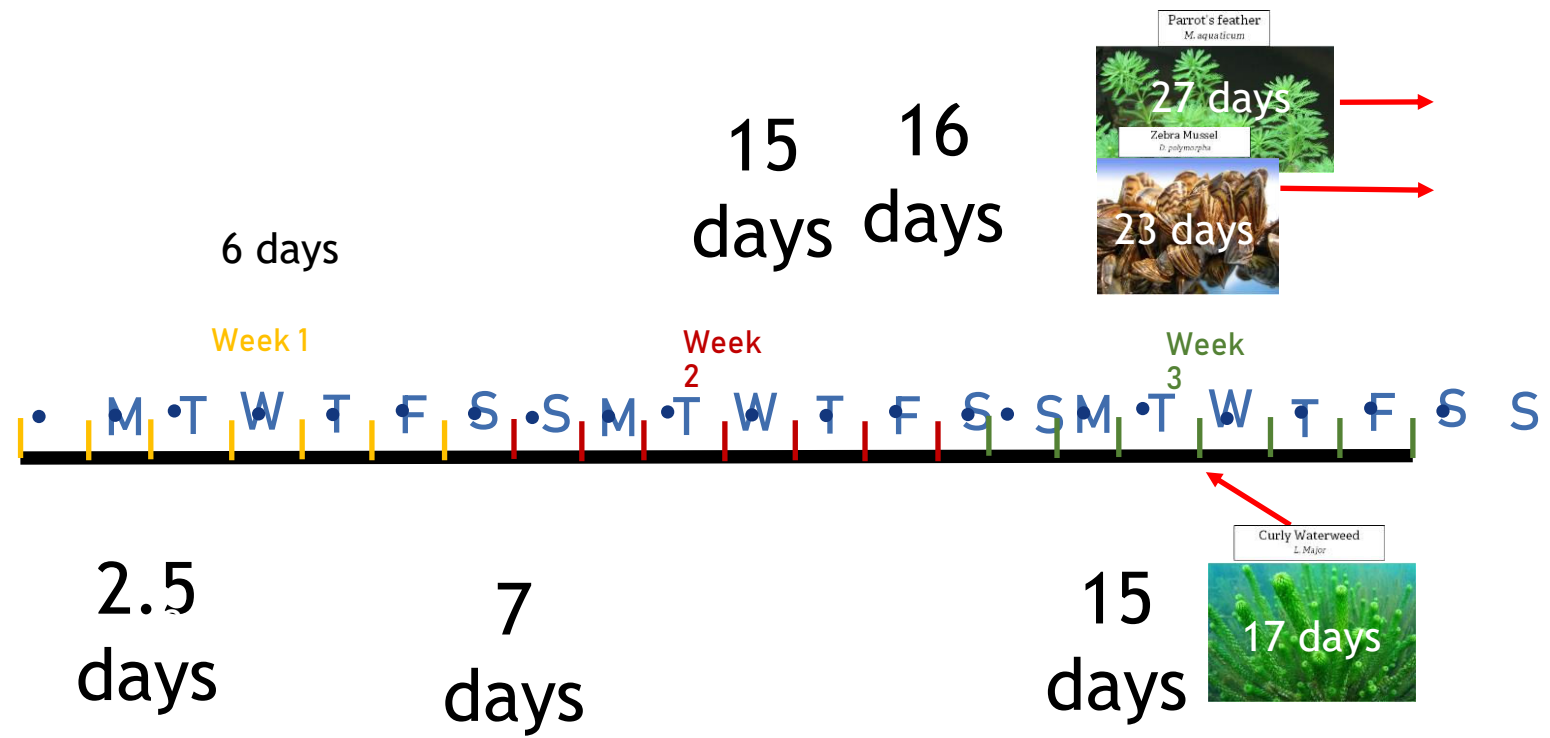
How long can these INNS last?



Add in drying



How long can these INNS last?



Add in Hot Water
(45C)



How long can these INNS last?

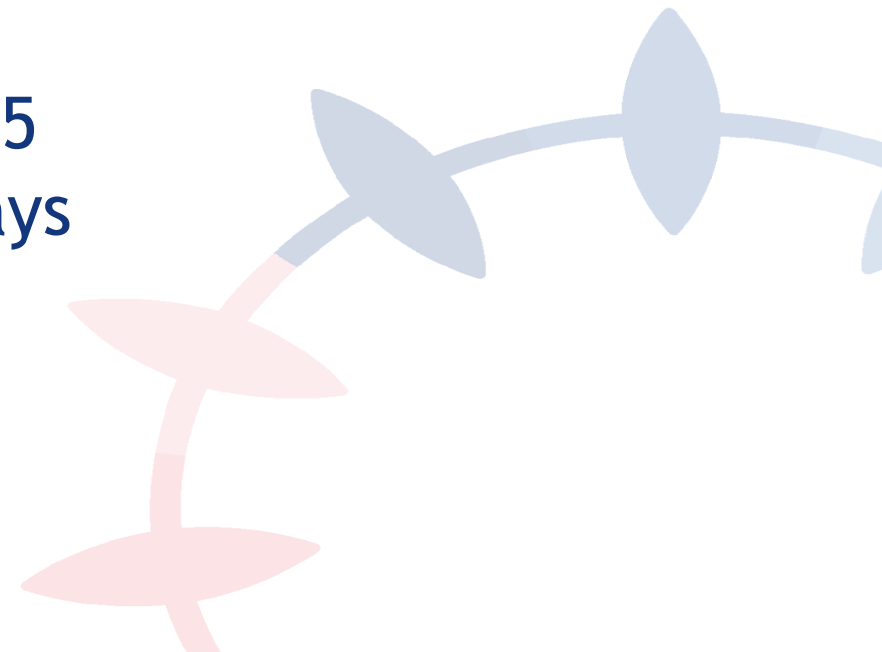


Clear
Access
Clear
Waters



7
days

15
days



What can I do?

What can I do?



1. **Check any clothing, tools or equipment** that have come into contact with the **water, or even mud** around water. Even the **tread on your bike** or the **fur of your dog** might be carrying an invasive species.
2. **Clean your clothing, tools or equipment.** Ideally with **hot water**, but a **good rinse with clean cold water** will also dislodge bits of plants and young animals that you can't see.
3. **Dry everything completely.** Ideally in the **sun, leaving no damp patches.** Don't forget about clothes as well, things like wet suits, waders and boots. Small invertebrates can live for days in damp folds in clothing and seeds can get stuck in the tread of muddy boots.

What can I do?



Educate members and visitors



Introduce biosecurity best practise & protocol



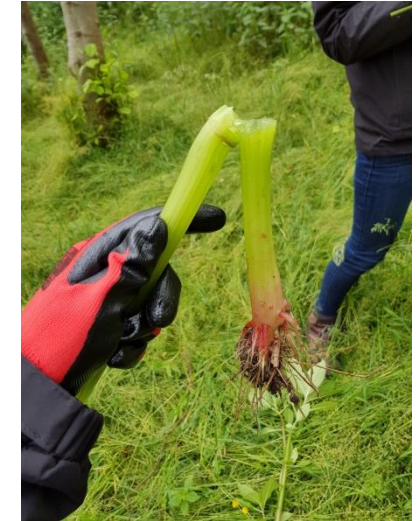
Help members and visitors to Check Clean



Introduce wash down stations etc.



Identify and record invasive species sightings



Carry out management or support volunteer activity .



Submitting your INNS Records/Sightings

Make a FREE account on the NatureSpot website> Log in> Click on the grey taskbar of the home page that says 'Submit Records'> Click on project drop down & select 'INNS Surveys'> Complete form:

<https://www.naturespot.org.uk/content/submit-records>

Records can be submitted on the desktop site or via the mobile app (I-Record') which you will need to download and link the projects to NatureSpot.

If you need any help with this form, see our short [video guide on YouTube](#) or visit the [illustrated guidance page](#).

Use this form to record all the species seen on the same date at the same location. Submit a fresh form for each different date and location.

Hover on the ? for help on filling in each box. A red asterisk indicates a required entry, other boxes are optional.

Once submitted every record is 'verified' to check that the identification and details are all correct. [Read more](#).

Project: ?

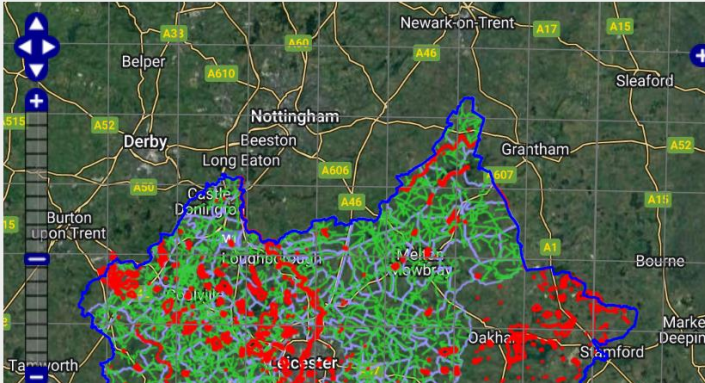
Overall comment: ?

Date: ?

Site name: ?

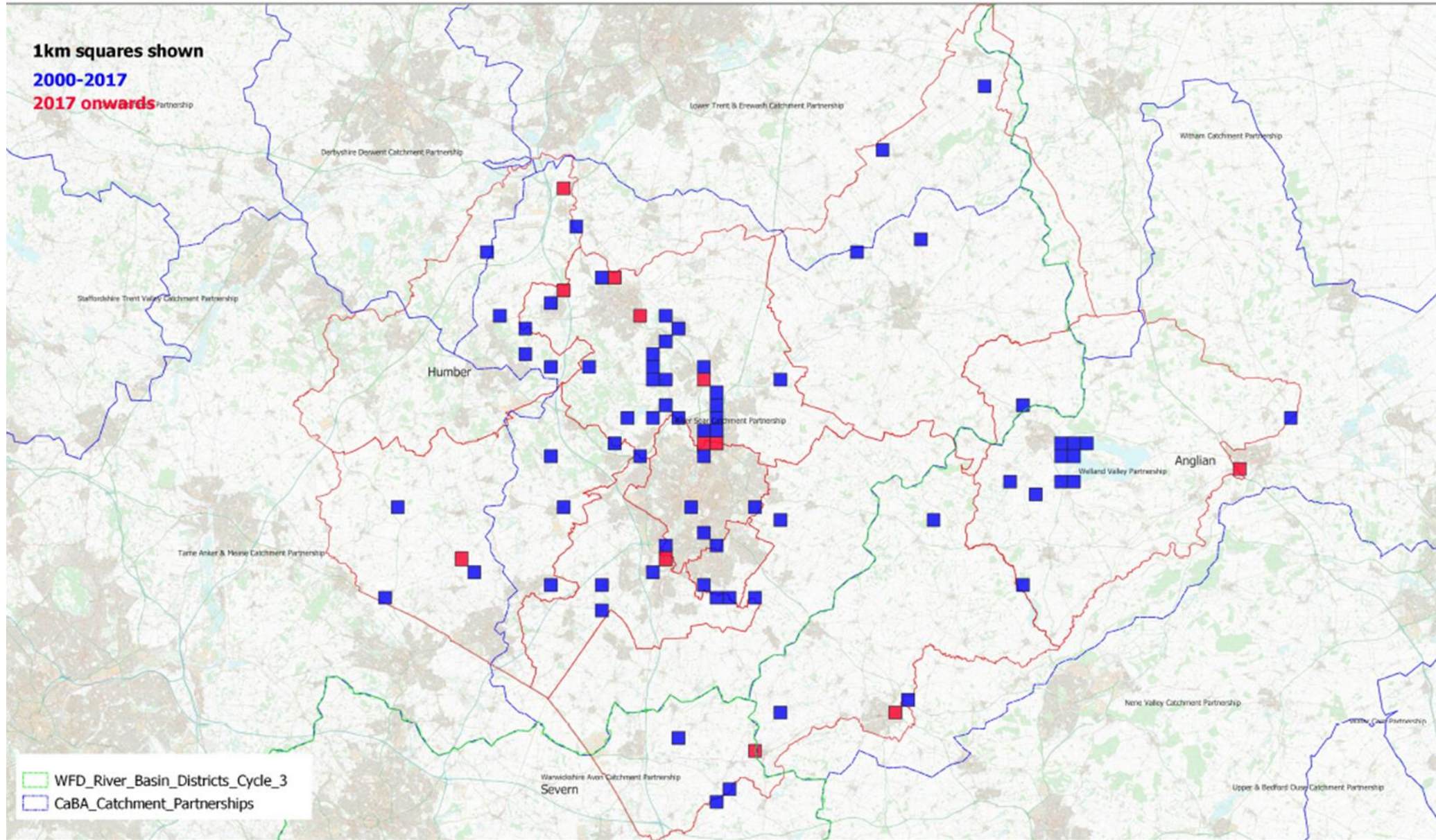
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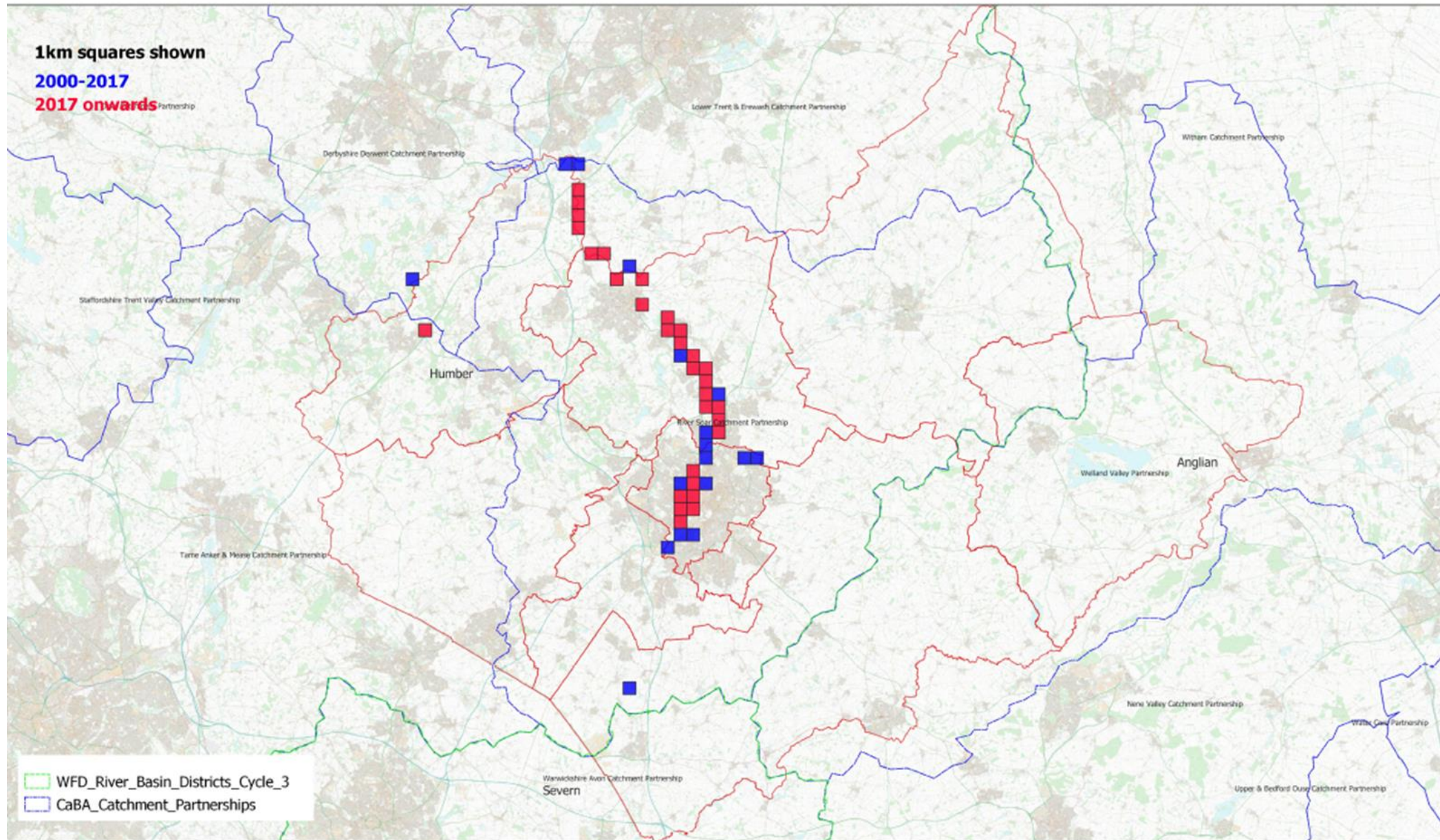
Search map to find: ? Search



American Mink (Neovision vison)

Leicestershire County Council. Licence number 100019271





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1:275,000

Managing Invasive & Non-native Species?

MANUAL

CHEMICAL

BIOCONTROL

Key ID Features

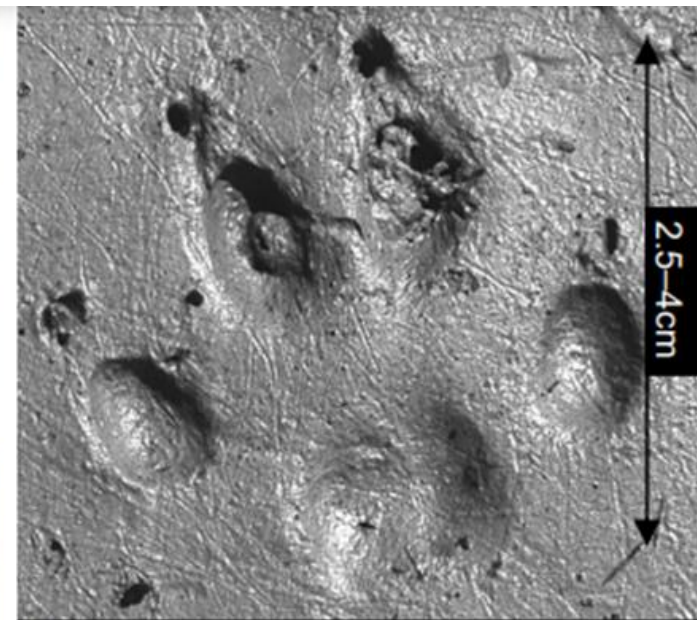


Body length
30-47cm

Glossy dark
brown/black fur

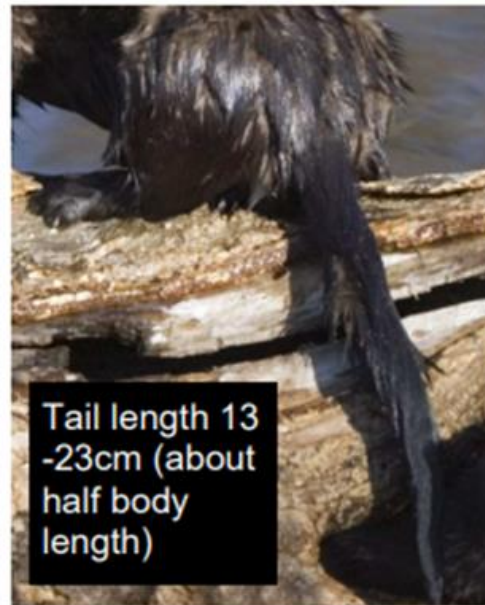


Usually has white patches on chin
and throat (small amounts of white
fur may be present on the upper lip)



2.5-4cm

Tracks may form paths leading to water,
occasional signs of tail dragging in mud

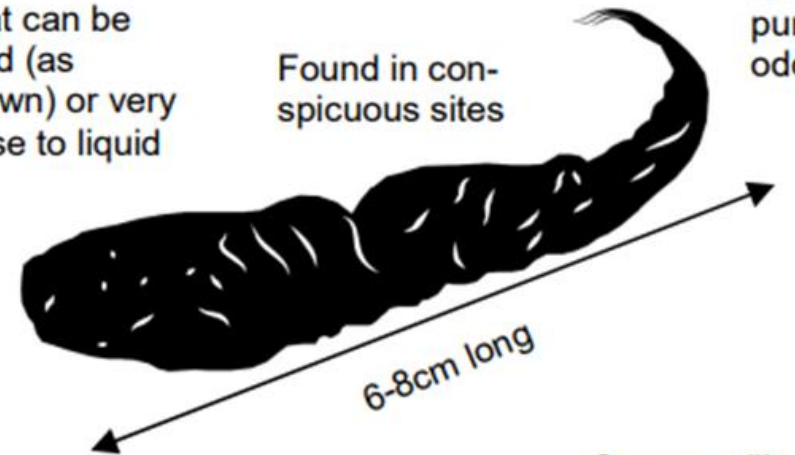


Tail length 13-23cm (about
half body
length)

Scat can be
solid (as
shown) or very
loose to liquid

Found in con-
spicuous sites

Strong
pungent
odour



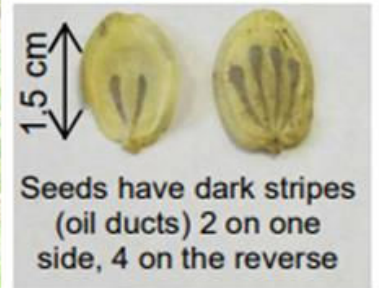
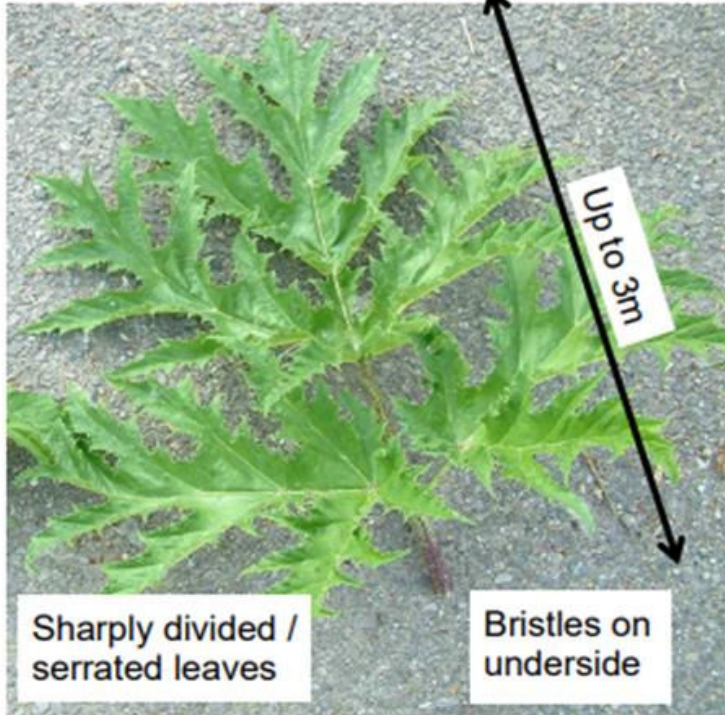
6-8cm long

Usually contains fur,
pieces of bone and feather

Sausage-like, but
twisted and drawn
out to a point



Key ID Features



Identification throughout the year

Spring



Summer



Winter



When to manage Japanese Knotweed with manual cutting

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Efficacy: Good, but canes must be disposed of carefully. Cutting is preferably a prelude to spraying.

Constraints: Time-consuming, and requires good access.

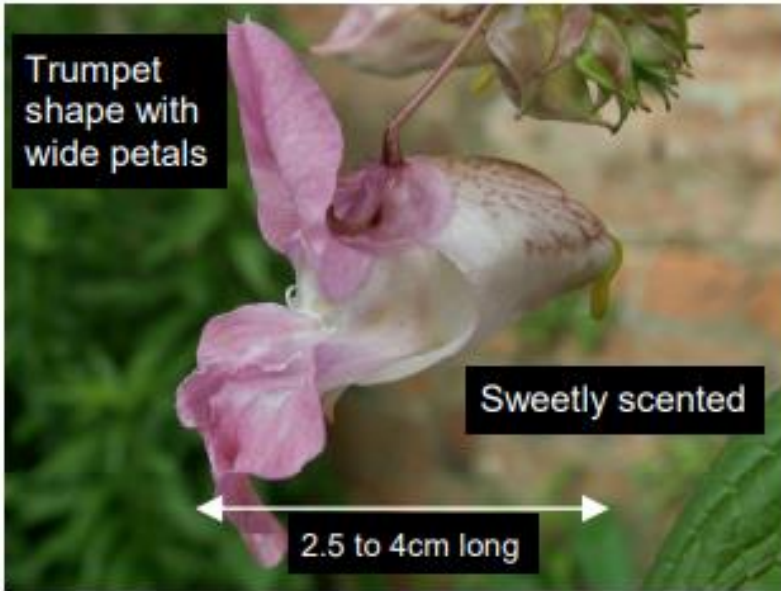
Timescale: Cutting between June – Oct, preferably as a prelude to spraying

Other management approaches include:

- Mechanical- grazing, cutting, digging etc
- Biological e.g. leafspot fungus , psyllid bugs (via CABI)
- Chemical Control e.g. spraying using Glyphosate, stem injection etc



Key ID Features



When to carry out control of Himalayan balsam by hand-pulling (depending on germination)

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Efficacy: Good

Constraints: Time-consuming, very labour intensive and requires good access. May be impractical for large populations. It takes a long time to clear a small area. Expensive if carried out by contractors (due to time required).

Timescale: Hand-pulling could start as early as March, but by May the plants will be large enough to recognise easily. Pulling should continue at least through June, prior to seed formation, though some plants can germinate later in the season so hand-pulling may need to continue through the autumn. **The optimum time for control is when the Himalayan balsam is just starting to develop flowering buds.**

Himalayalm Balsam control (examples continued)

- **Mechanical-** cutting or mowing
- **Chemical-** spraying with glysophate. Glysophate is the only herbicide recommended to use for the control of Himalayan Balsam in England This is also the only active herbicidal ingredient allowed to be used near any water body in the England, including rivers, streams lakes and ponds.
- **Shading**
- **Biocontrol-** e.g. rust fungus



Deciding on the most appropriate management for INNS on your site?

- Type of species e.g. terrestrial or riparian, freshwater
- Habitat type & wildlife protection
- Location e.g. close to a water course
- Accessibility e.g. equipment
- Costs
- Labour & resource
- Skill base & training e.g. specialist & trained contractors
- Seasonality & control timing
- Disposal method e.g. landfill, on site, permits etc
- Legislation
- H&S considerations e.g. permissions, relevant certification, Natural England licensing & protected sites (restrictions), control of hazardous substances (assessment)
- PPE etc

Questions?



Thank You

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