Control & Management of Invasive Alien Plant Species

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Scope

- What are invasive alien species (IAS) and why so successful?
- What are the most problematic plant species?
- Legislation
- Control / Treatment

Invasive Alien Species (IAS)

"Species introduced outside their natural range whose presence and/or spread threatens biological diversity, the environment, ecosystem services, the economy and human health"

The EC has recognised IAS introductions as one of the main causes of natural biodiversity loss (second only to direct habitat destruction)

Why are IAS so Successful?

- Few or no predators or pathogens
- Fast growth rate and highly productive
- Wide habitat tolerance
- Thrive in disturbed habitats and vacant niches
- Reproduction: clonal; fragmentation; seeds
- Seeds: large nos.; young at first seed set; seed longevity
- Wide ranging dispersal mechanisms

Economic Cost of Invasive Species

Estimated damage from IS worldwide is $1.4 trillion or 5% global economy

$1,400,000,000,000

Total annual cost in the European Union is > €12 billion (2008)

Total annual cost in Britain is > £1.7 billion (2010)

Total annual cost in Ireland is > €266 million (2013)

Highest impact species (Britain):

Japanese knotweed	£166 million *pa*

High Impact Invasive Riparian & Aquatic Plant Species in Ireland

Japanese knotweed	*Fallopia japonica*
Giant knotweed	*Fallopia sachalinensis*
Bohemian knotweed	Fallopia x bohemica
Himalayan knotweed	*Persicaria wallichii*
Himalayan balsam	*Impatiens glandulifera*
Giant hogweed	*Heracleum mantegazzianum*
Chilean / Giant rhubarb	*Gunnera tinctoria*
Winter heliotrope	*Petasites fragrans*
Old man's beard	*Clematis vitalba*
Rhododendron	*Rhododendron ponticum*

Japanese Knotweed (and related species ….)

Key Features of Knotweeds

Japanese knotweed

Grows to 3m tall
Leave flat, with no hairs underneath
Flower cluster longer than leaf

Bohemian knotweed

Taller than Japanese knotweed
Leaves larger, with indented and flat forms
Short hairs present on underside
Flower clusters same length as leaf

Giant knotweed

Plants to 5m tall
Leaves large and distinctly indented
Long hairs present on underside
Flower clusters shorter than leaf

Himalayan Knotweed

Winter Heliotrope

Old Man's Beard (*Clematis vitalba*)

Himalayan balsam

Giant Hogweed

Chilean Rhubarb or Gunnera

Be under no allusions

Invasive alien plant species are highly dangerous

…… and the problem is continuing to worsen!!

IAS Legislation

EC (Birds and Natural Habitats) Regulations 2011 (SI 477)

Regulation 49

In the absence of a licence, any person who '*plants,* ***disperses, allows or causes to disperse, spreads or otherwise causes to grow***' any of the specified plants* shall be guilty of an offence.

(* Knotweed species, Giant hogweed, Himalayan balsam….)

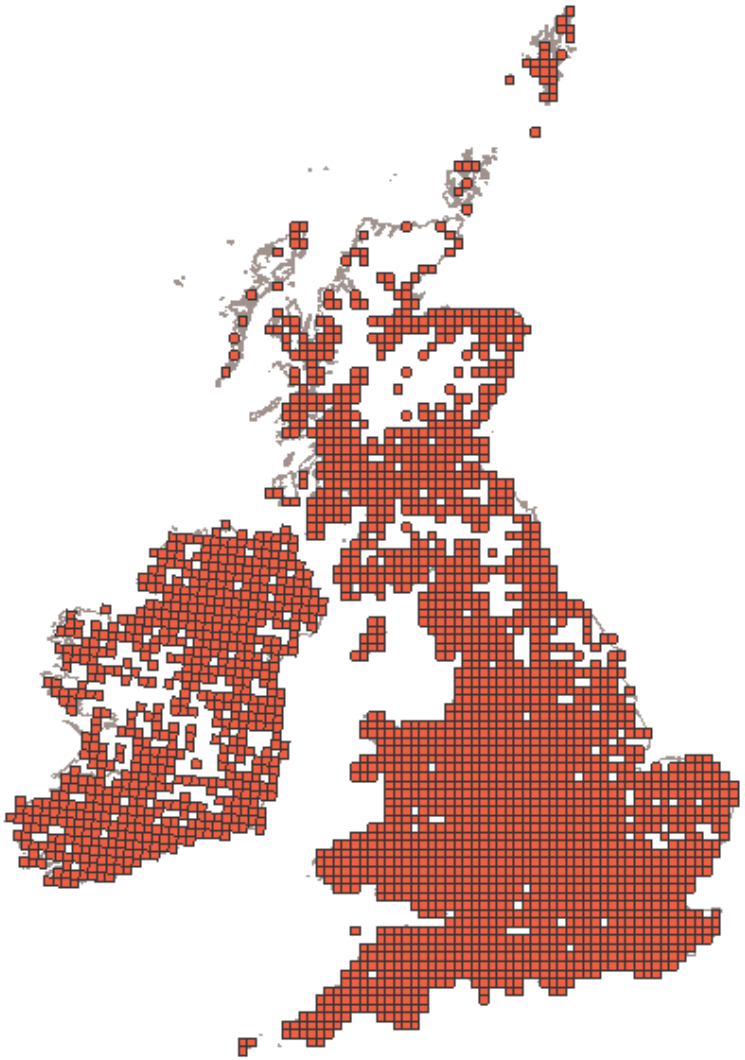
Third Schedule – Part 3 (Regulation 49)

Soil or spoil contaminated with Knotweed spp cannot be moved without a licence

EU Regulation on the prevention and management of the introduction and spread of invasive alien species (1143/2014)

Provides a framework for action to prevent, minimise and mitigate the adverse impacts of IAS on biodiversity and ecosystem services for all MS

Focus on Japanese Knotweed



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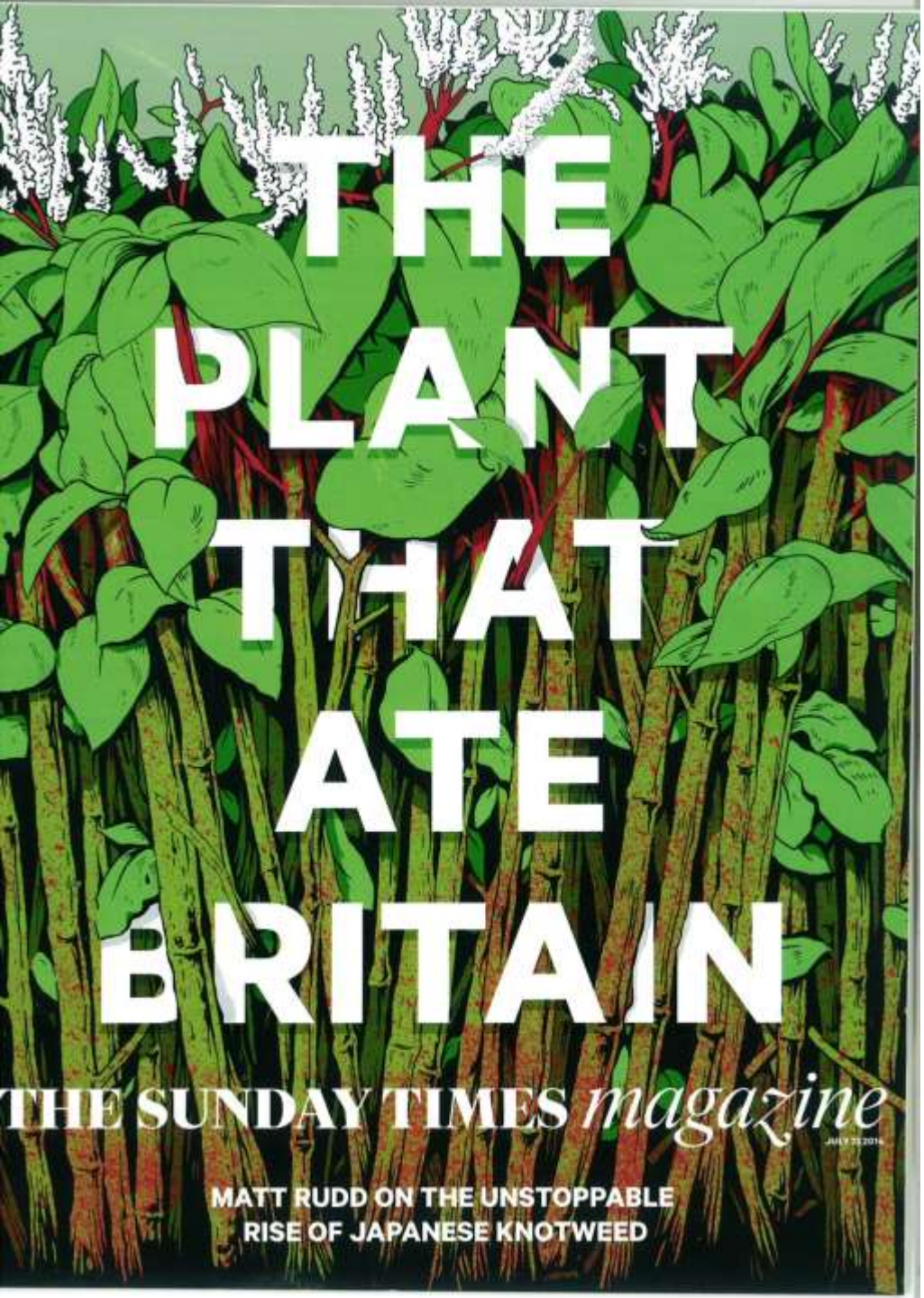
Japanese Knotweed – A Real Problem on our Roads… and elsewhere

Knotweed Infestations

How Is Japanese Knotweed So Invasive?

- Fast growing species
- Deeply penetrating woody rhizomes – 3m deep and 7m distant
- Tiny rhizome fragments (0.7gm) can produce new plant in 10 days
- Rhizomes may remain dormant (and viable) for up to 20 years
- Cut (fresh) stems produce shoots and roots from nodes when buried
- Out-competes and eliminates native vegetation in infested situations
- Causes bankside subsidence in river corridors
- Blocks sight lines and signage on roads and railways
- Grows through concrete, tarmac and other hard standing causing problems for road surfaces, pathways, walls and building foundations



Japanese Knotweed

The Sunday Times (supplement)

…..**cannot** get mortgages to upgrade or sell property in UK and NI

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Knotweed Damage

What Should You Do If You Encounter Japanese Knotweed?

Avoid it

Report sighting(s) to Local Authority

Do not cut or trim as this **will** spread the weed

Where control is necessary, follow strict guidelines:

- biosecurity is paramount

Biosecurity

*Biosecurity covers all activities aimed at managing or preventing the introduction and spread of invasive species ….. and mitigating their impacts (*Caffrey et al. 2014)*

*Management of Biological Invasions (2014), 5 (1): 1 - 20

Biosecurity - Preparation and Planning is Vital to Success

On construction sites:

- assess the risks and record (what species, where, what extent, origin…)

- cordon off site and erect IAS signage

- limit the number of entry and exit points

- ensure all vehicles and equipment arrive clean (certified, if possible)

- do not import topsoil or only if certified IAS-free

- only dump IAS and contaminated spoil in approved / licenced landfills

- provide cleaning / disinfection stations at access points

- always clean before leaving the site

What Should You Do If You Encounter Japanese Knotweed?

Avoid it

Report sighting(s) to Local Authority

Do not cut or trim as this **will** spread the weed

Where control is necessary, follow strict guidelines:

- biosecurity is paramount
- record (GPS, map, photo) location / extent of all infestations
- how and when treated
- using what method(s)
- method of disposal, if required

Control of Japanese Knotweed

Chemical control
- foliar spray
- stem injection

Excavation

Combination of above

Chemical Control

Must *be conducted by experienced and qualified operators (Sustainable Use of Pesticide Directive – SUDS)*

Foliar application

Glyphosate (as Roundup Gold); use of adjuvant may be desirable

Most effective following flowering (Sept / Oct)

- ‘use biology against itself’

Monitor and retreat, as necessary

Chemical Control

Stem injection

For selective application in sensitive areas or to relatively small stands

Inject concentrate (> 5:1) directly into the stem c. 20 – 30cm above ground (between 1st and 2nd nodes

Most

Optio

Excavation

Be aware of: *Waste Management Acts 1996-2008 (Ireland)*
EC (Birds and Natural Habitats) Regulations 2011

Treat with herbicide 2 – 3 weeks before excavation

Deep burial on site

- determine the extent of the rhizome penetration
- map and record exact location of burial site
- bury to a depth of 5m
- cover with a root barrier membrane layer
- infill with uncontaminated earth

Disposal to Landfill

- double bag small quantities in heavy duty bags
- use biosecure skips (lined and covered with appropriate membranes)
- use approved / licenced landfill
- inform operator beforehand

This method is very expensive and should be the method of last resort

NRA Pilot Treatment Programme (2014)

Japanese Knotweed on N70 (Kerry)

To develop a national strategy to halt / stop spread of Jk on national road network

Locations and extent along N70 systematically recorded (GIS) in 2014

Foliar and stem injection treatments used in 2015 to assess relative efficacy

Assessment in 2016 will inform future TII National Strategy for Jk control

NRA Pilot Treatment Programme on N70 (Kerry) - 2015

Can Japanese Knotweed be Managed Nationally?

Currently, Jk is expanding rapidly

It's spread is being expedited by lack of information and lack of good biosecurity practice among contractors, etc.

It is never too late to start - NRA initiatives are progressive and encouraging

National awareness of the problem is required

The problem can be managed but it will need time, funding, commitment and coordination

Thank You For Your Attention