Iascach Intíre Éireann
Inland Fisheries Ireland

Control and Management of Freshwater Invasive Species in Ireland

- and the proposed Regulation

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Inland Fisheries Ireland

Benelux Conference, Ghent University - 2nd April 2014

CIRB

European Union
European Regional Development Fund
Investing in your future

SCOPE

Legislation and IAS

Aquatic IAS in Ireland

Approach to control and management of aquatic IAS in Ireland
- using *Lagarosiphon major* as an example (lessons learned)

Importance of biosecurity

Legislation and IAS in Ireland

Ireland is taking the threat posed by IAS seriously

EC (Birds and Natural Habitats) Regulations 2011

Reg 49 – Prohibition on introduction and dispersal of certain species
Reg 50 – Prohibition on dealing in and keeping certain species

Wildlife Order (NI) 1985 (as amended)

IFI Inland Fisheries Act (2015)
Head 54 – Invasive organisms and biosecurity

Proposed EU Regulation on IAS

Proposed EU Regulation on IAS

Will require all MS to rethink their attitudes to IAS

Framework for action to:

identify most threatening IAS ….

identify pathways of introduction

establish rigorous early detection mechanisms

apply early eradication measures

effective management measures

restoration

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Obligations of the proposed Regulation (relating to control and management)

Article 17 Rapid eradication at an early stage of invasion

1. … MS shall apply eradication measures …
2. … methods used are effective in achieving complete and permanent removal …

Article 19 Management measures

1. … MS shall have in place effective management measures

For most IAS proven effective management measures are rarely available

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Control & Management of IAS in Europe

Highly complex

- Large number of stakeholder groups
- No single responsible agency - no one is accountable!
- Policy / legislation non-existent, unclear and unenforced
- Costly and labour intensive (with established IAS)
- Relatively ineffective
- Impediments at MS or European level

IAS in Ireland

- 377 recorded non-native species (342 non-native potential invasives)

  66% - low impact
  21% - medium impact
  13% - high impact

- High and medium risk species - 67% terrestrial
  - 21% freshwater
  - 12% marine

Freshwater

- rate of increase in introductions greatest since 1980
- largest number of high impact species

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High Impact Invasive Riparian & Aquatic Plant Species

Himalayan balsam	*Impatiens glandulifera*
Knotweed spp	*Fallopia / Polygonum* spp
Giant hogweed	*Heracleum mantegazzianum*
Rhododendron	*Rhododendron ponticum*
Curly leaved waterweed	*Lagarosiphon major*
New Zealand pigmyweed	*Crassula helmsii*
Nuttall's waterweed	*Elodea nuttallii*
Parrot's feather	*Myriophyllum aquaticum*
Fringed water lily	*Nymphoides peltata*
Water fern	*Azolla filiculoides*

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High Impact Invasive Aquatic Invertebrate & Fish Species

Asian clam	*Corbicula fluminea*
Chinese mitten crab	*Eriocheir sinensis*
Zebra mussel	*Dreissena polymorpha*
Bloody red shrimp	*Hemimysis anomala*
Chub	*Leuciscus cephalus*
Dace	*Leuciscus leuciscus*

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What Next to the Island of Ireland?

Dikerogammarus spp

Pacifastacus leniusculus

Pseudorasbora parva

Egeria densa

Ludwigia grandiflora

Hydrocotyle ranunculoides

Gyrodactylus (Salmon fluke)

Koi Herpes Virus

Control & Management of Freshwater IAS in Ireland

IFI research aims to develop / refine practical control methods

Life cycle research

Mechanical control

Light exclusion

Biological control

(Chemical control)

Biosecurity

Control & Management of Freshwater IAS in Ireland

Successful control and management methods

Lagarosiphon major
Curly-leaved waterweed

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Lagarosiphon major

Highly invasive aquatic

Native to Southern Africa

'Oxygenating weed'

Artificial watercourses

1st confirmed in L Corrib in 2005

Rinerroon Bay, Lough Corrib pre-*Lagarosiphon major*

Rinerroon Bay, Lough Corrib post-*Lagarosiphon*

2005	1,640 tonnes (wet wt)
2007	2,700 tonnes (wet wt)

Why is *Lagarosiphon* a Problem?

No natural enemies in Ireland

Extremely fast growth rate

Dispersal through fragmentation

Canopy forming – excludes native plants

Alters macroinvertebrate community structure

Creates improved conditions for non-salmonid fishes

Life Cycle Studies (find a weak link…)

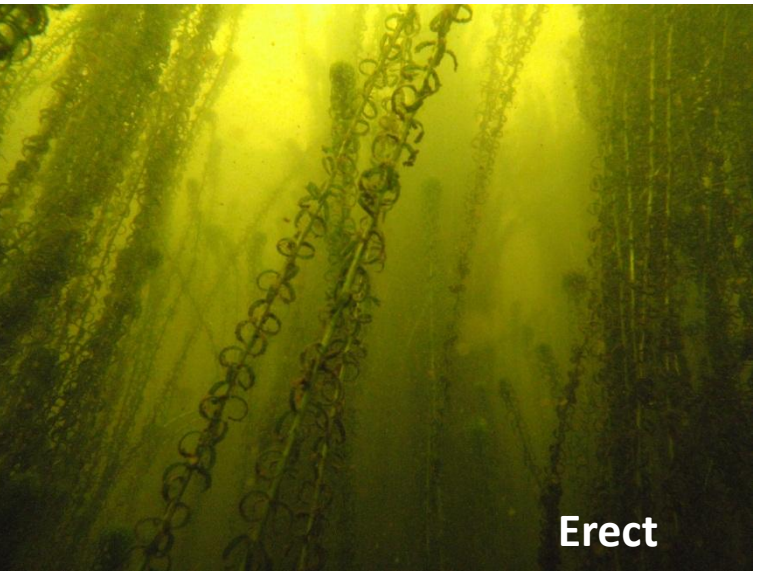
Reproduction is vegetative – no seed reserve!

Damage to root node is highly traumatic

Two distinct morphological phases:

Tall, canopy-forming growth

Collapsed condition



Life Cycle Studies (find a weak link…)

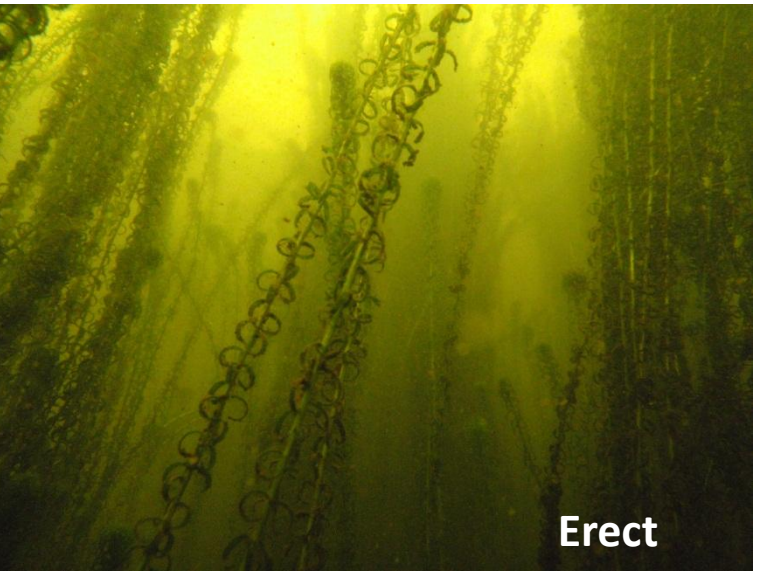
Reproduction is vegetative (only female plants in Ireland)

Damage to root node is highly traumatic

Two distinct morphological phases:

Tall, canopy-forming growth (winter / spring) ?

Collapsed condition (summer / autumn) ?



Mechanical Cutting of *Lagarosiphon major*

In winter - stems erect and buoyant

Traditional cut uses reciprocating blades

Deep cut using paired V-blades*

Fragment retention net

Dedicated V-blade cutting boat

* Caffrey *et al.* (2011) *Biology and Environment* 111B (3), 1 – 8.

Bob’s Island, Lough Corrib

Mechanical Cutting in Lough Corrib

In winter - stems erect and buoyant

Traditional cut uses reciprocating blades

Deep cut using paired V-blades

Cuts applied for 6 months each year

Results monitored by divers

Regrowth is minimal

80 ha of *Lagarosiphon* cleared in 3 yrs

Method currently widely used in Ireland

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Light Exclusion using Jute Matting

Aquatic plants require light for growth

Open-weave fabric - jute or hessian

Natural fibre

Biodegrades totally

Saturates and sinks quickly

Light Exclusion using Jute Matting*

Preliminary trials proved highly effective

Lagarosiphon died rapidly beneath jute

And then something totally unexpected

Native charophyte vegetation grew through matting within 4 months

Dense meadows established within 10 months – NATURAL RESTORATION

No *Lagarosiphon* has grown through geotextile

* Caffrey *et al.* (2010) *Aquatic Invasions* 5(2), 123 – 129.


Charophyte meadow on jute after 10 months

Light Exclusion using Jute Matting*

Preliminary trials proved highly effective

Lagarosiphon died rapidly beneath jute

And then something totally unexpected

Native charophyte vegetation grew through matting within 4 months

Dense meadows established within 10 months – NATURAL RESTORATION

No *Lagarosiphon* has grown through geotextile

150,000 sq m of jute now laid on *Lagarosiphon*
achieving ± total control

Technique now widely used outside Ireland

* Caffrey *et al.* (2010) *Aquatic Invasions* 5(2), 123 – 129.

Control & Management of Freshwater IAS

Successful control sometimes needs use of more ‘draconian’ methods

- herbicides
- pesticides
- piscicides


Nuclear option

Control & Management of Freshwater IAS

Successful control sometimes needs use of more ‘draconian’ methods

- herbicides
- pesticides
- piscicides

Can be totally safe and highly effective, in the right hands…..

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Control & Management of Freshwater IAS

Successful control sometimes needs use of more ‘draconian’ methods

- herbicides
- pesticides
- piscicides

Can be totally safe and highly effective, in the right hands…..

Regulation should consider provision of derogations – under strict control ……

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Control & Management of Freshwater IAS in Ireland

Biosecurity

To reduce introduction of new IAS and spread of existing IAS

Article 7

2. MS shall take all necessary steps to prevent the unintentional introduction or spread of ……

Biosecurity must become instinctive and integral to one's water-based activities

IFI actively liaise with stakeholders and inform, train, demonstrate …….

But we will also legislate and enforce

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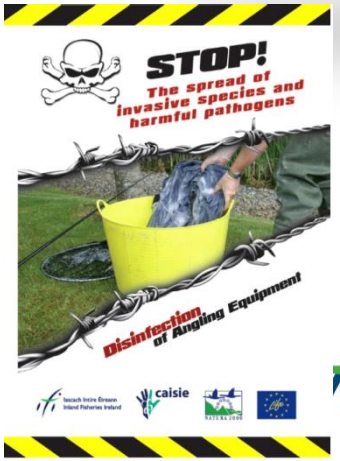
IFI Education & Awareness Materials

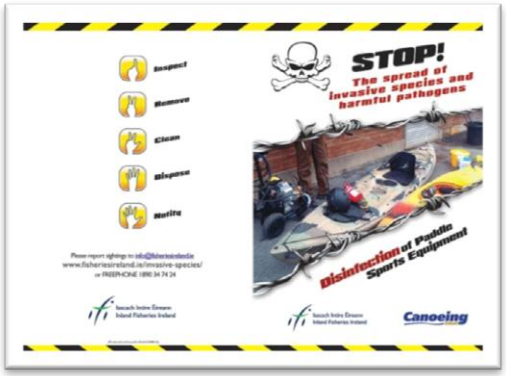
Information leaflets
Popular, technical and scientific articles
Biosecurity protocols for stakeholders
Signage
Pop-ups and back-drops
IS Alerts
Identification guides (e.g. leaflets, key rings)
Calendars
Rulers, badges, wrist bands, T-shirts, pens, USB keys
Angler Disinfection Kits
etc….

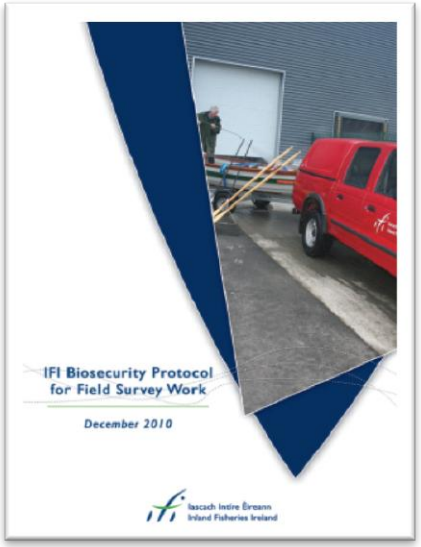
Emergency no. (24/7)
Websites
Facebook and Twitter
DVDs
App for smart ‘phones



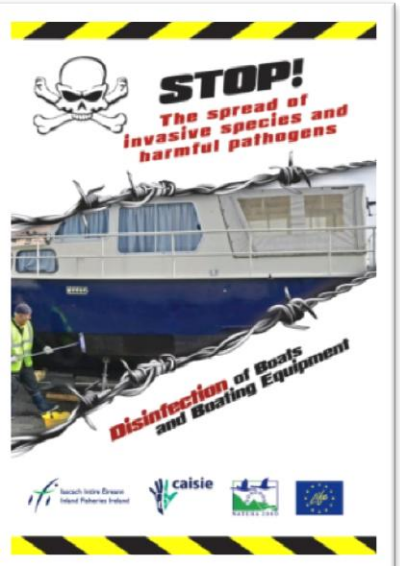
Agreed IFI Biosecurity Protocols

- IFI staff
- Scientific survey teams
- Anglers
- Boaters
- Fish stocking operations
- Scuba divers
- Paddle sports





- Contractors – obligations under Section 14



Control & Management of Freshwater IAS in Ireland

Biosecurity

IFI have worked to develop Biosecurity Best Practice among Stakeholders

Efficient and effective cleaning / disinfection methods

Angler disinfection kit

Permanent disinfection station

Disinfection for major water-based events

Disinfection for boats

Its all about winning the hearts and minds of the stakeholders

We are winning!!

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Thank You for your Attention