Riverbanks as battlegrounds

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How does Himalayan balsam change riparian habitats?

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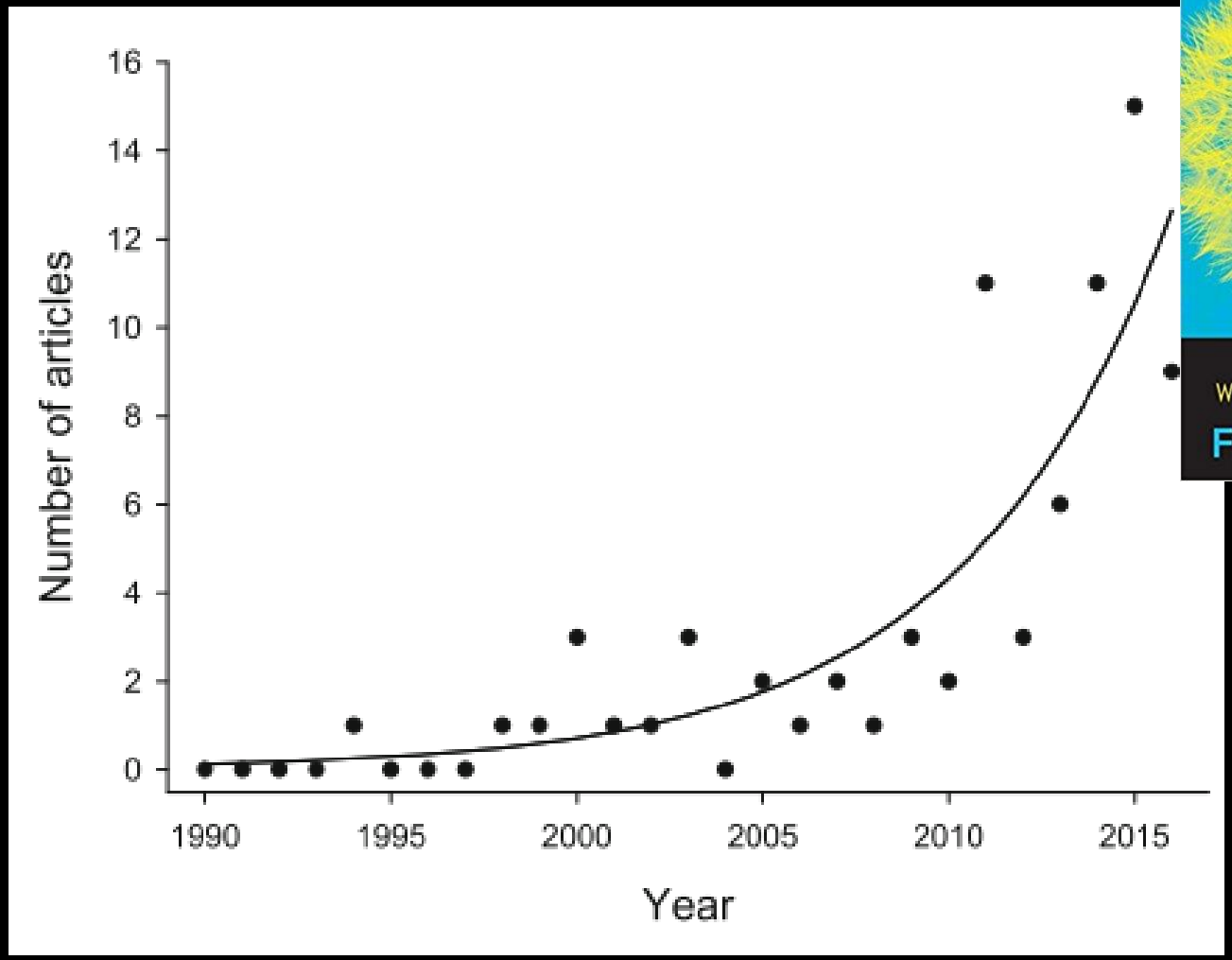
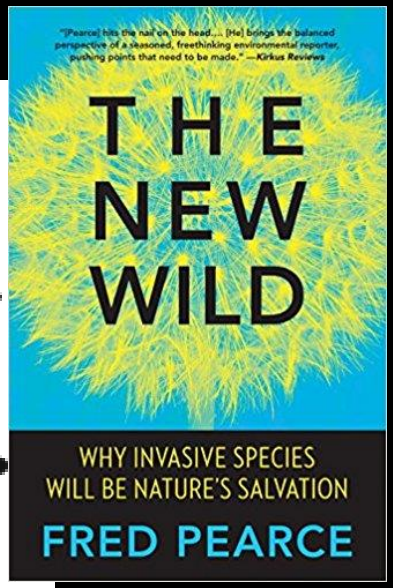
BE THE DIFFERENCE

The exponential growth of invasive species denialism





Ricciardi & Ryan (2018) Bio. Invs.


Pre-1930
Kirkwall
Elgin
Inverness
Portree
HEBRIDES
Aberdeen
SCOTLAND
Dundee
St Andrews
Edinburgh
Glasgow
Londonderry
Derry
NORTHERN IRELAND
United Kingdom
Newcastle upon Tyne
Durham
Sligo
Isle of Man
Dundalk
Drogheda
Great Britain
Manchester
Dublin
Galway
Ireland
Liverpool
Sheffield
Limerick
Kilkenny
Birmingham
Norwich
Tralee
Waterford
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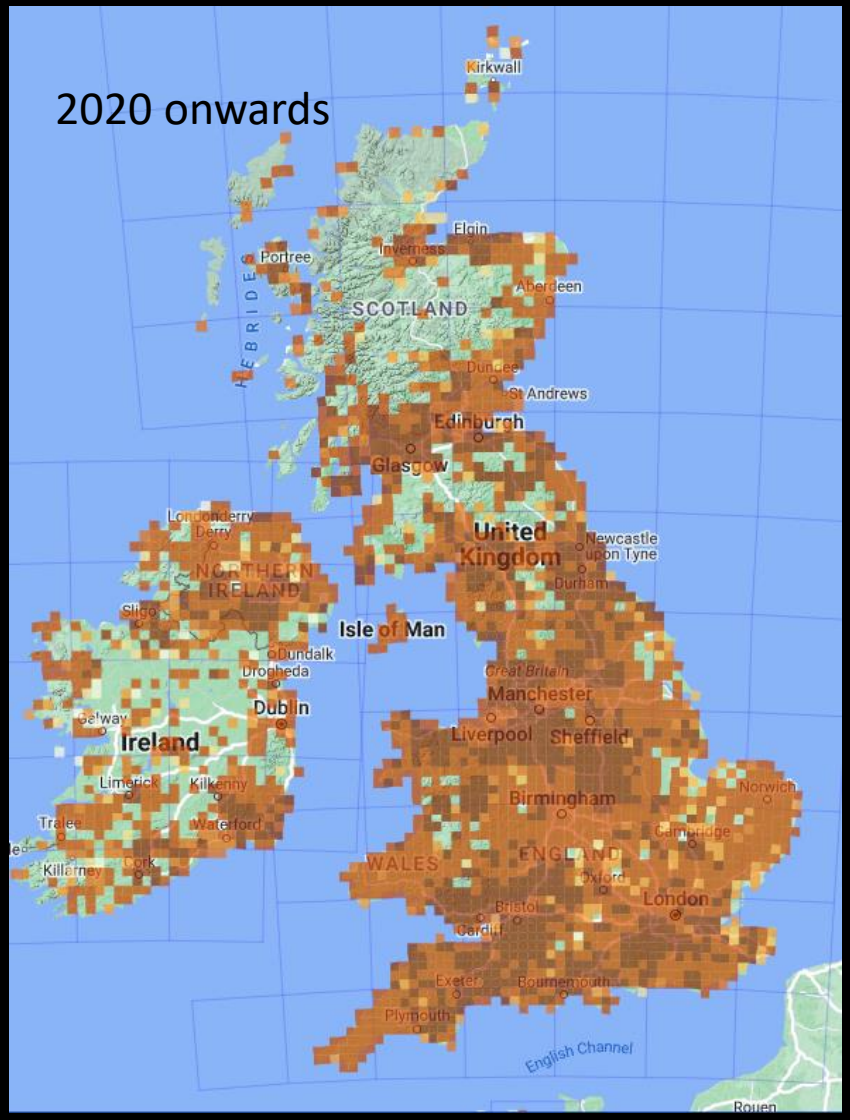
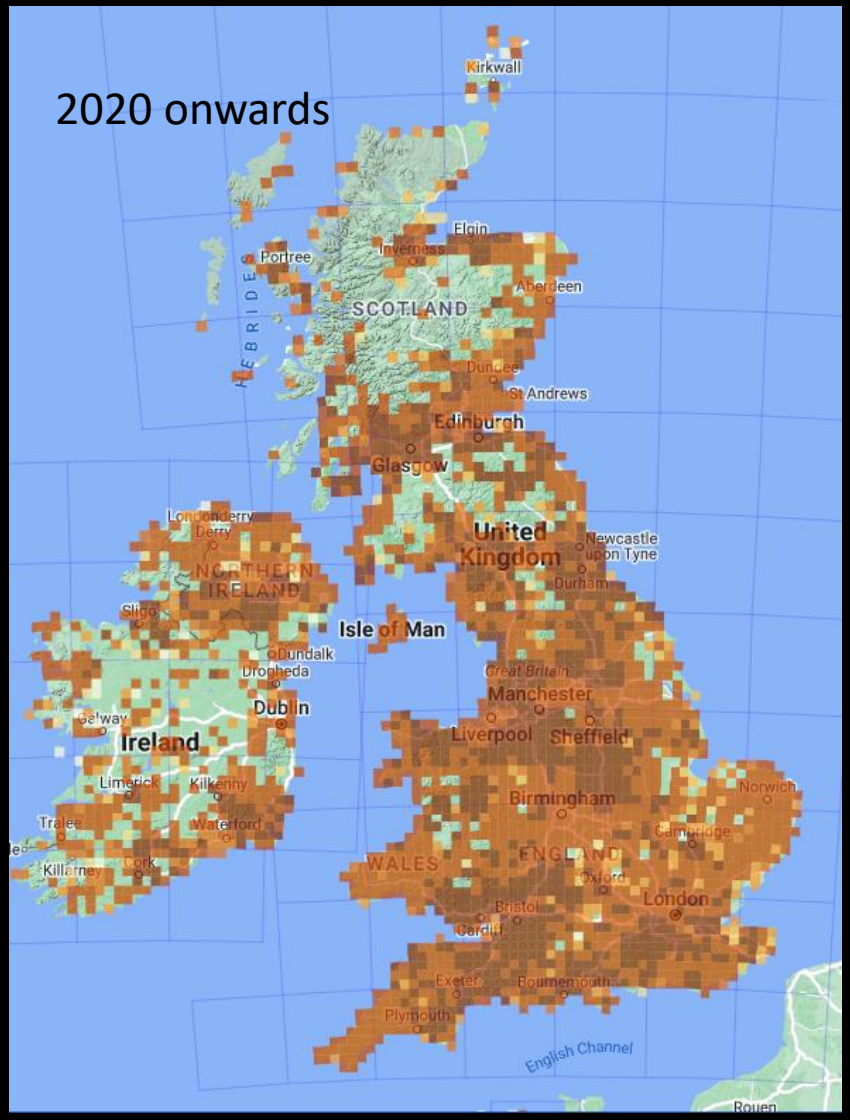
Dingle
Killarney
Cork
WALES
ENGLAND
Oxford
London
Bristol
Cardiff
Exeter
Bournemouth
Plymouth


2020 onwards
Kirkwall
Elgin
Inverness
Portree
HEBRIDES
Aberdeen
SCOTLAND
Dundee
St Andrews
Edinburgh
Glasgow
Londonderry
Derry
United Kingdom
Newcastle upon Tyne
NORTHERN IRELAND
Durham
Sligo
Isle of Man
Dundalk
Drogheda
Great Britain
Manchester
Dublin
Galway
Ireland
Liverpool
Sheffield
Limerick
Kilkenny
Birmingham
Norwich
Tralee
Waterford
Cambridge
Killarney
Cork
WALES
ENGLAND
Oxford
London
Bristol
Cardiff
Exeter
Bournemouth
Plymouth
English Channel
Rouen

BSBI data

Pattison et al. 2017 *App.Veg.Sci*

34 % ↑ no. of invaded sites along lowland rivers

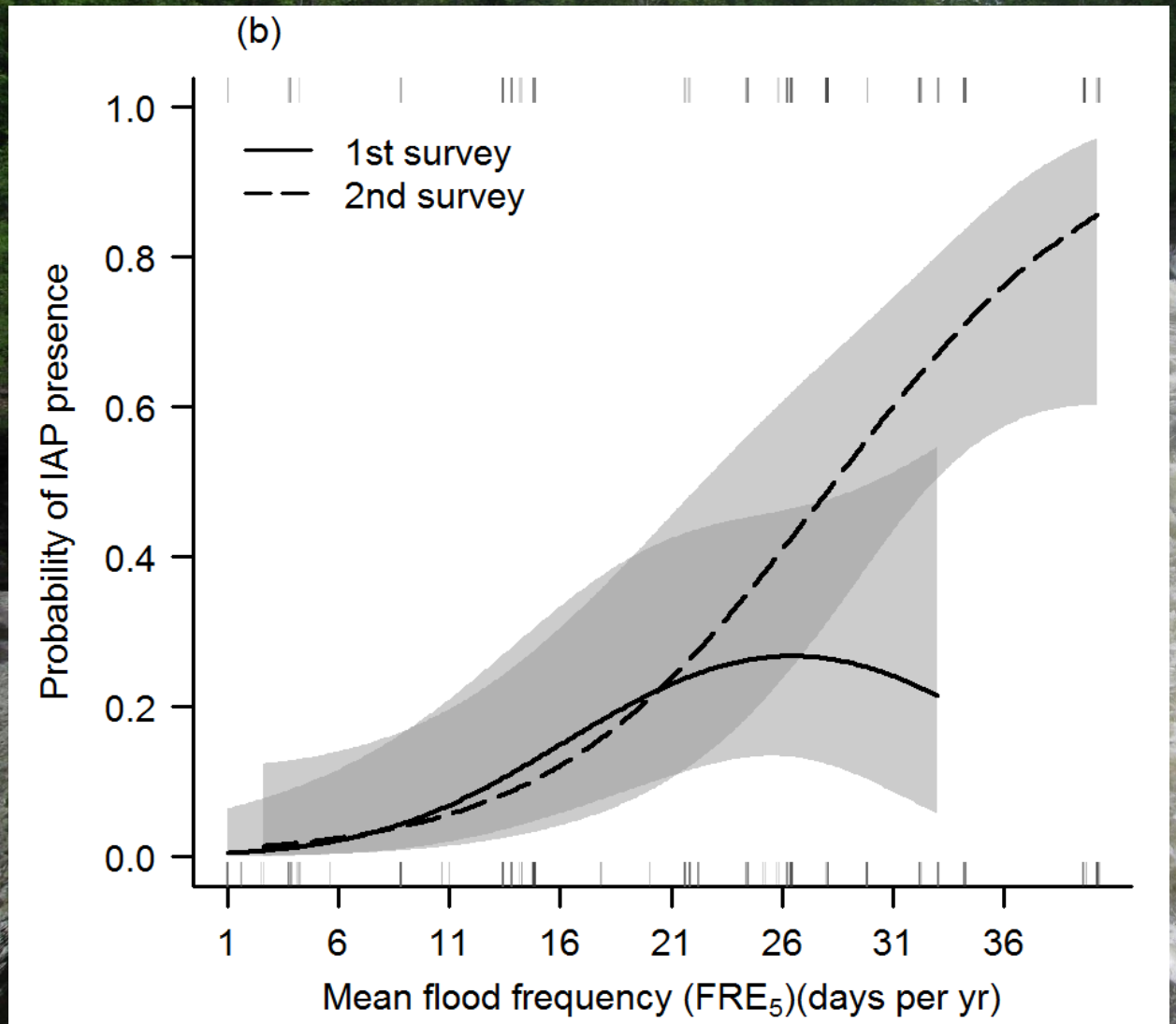


BSBI data

The environment is changing

The environment is changing

27% ↑ in mean annual flow



Pattison et al. 2017 *App.Veg.Sci*

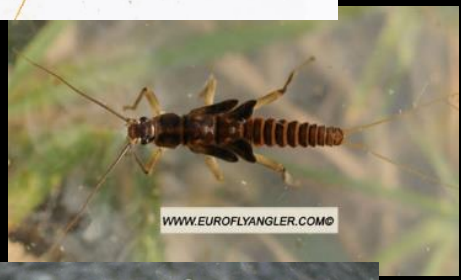
Native communities have changed overtime with invasion

Pattison et al. 2017 *App.Veg.Sci*

Native communities have changed overtime with invasion

Pattison et al. 2017 *App.Veg.Sci*

Native communities have changed overtime with invasion



Pattison et al. 2017 *App.Veg.Sci*

Seeney et al. 2018 *Freshwater Biol.*
Seeney et al. 2019 *Bio. Invs.*

Riverbank erosion: are invasive plants to blame?

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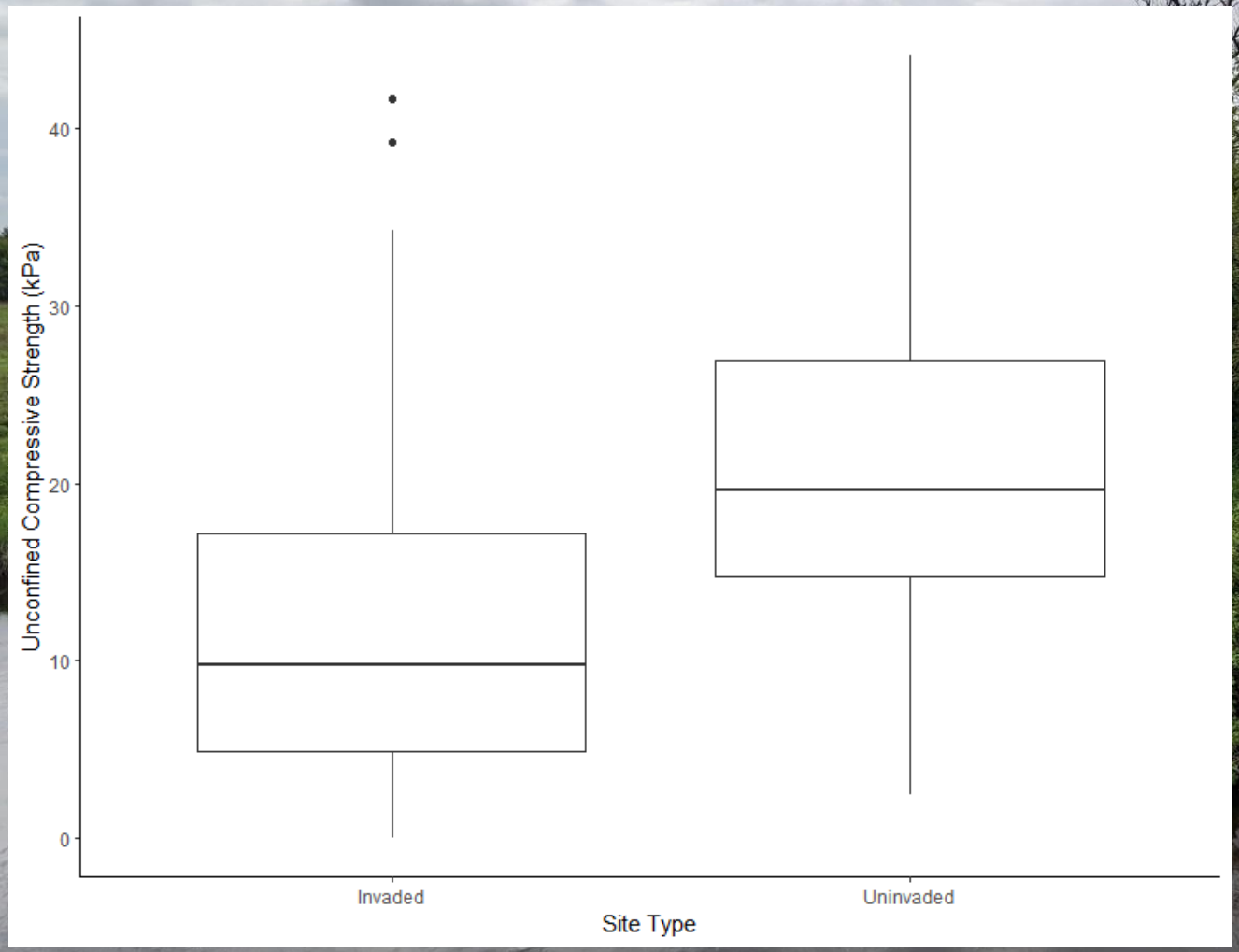

How to be as successful as HB? leave a legacy!

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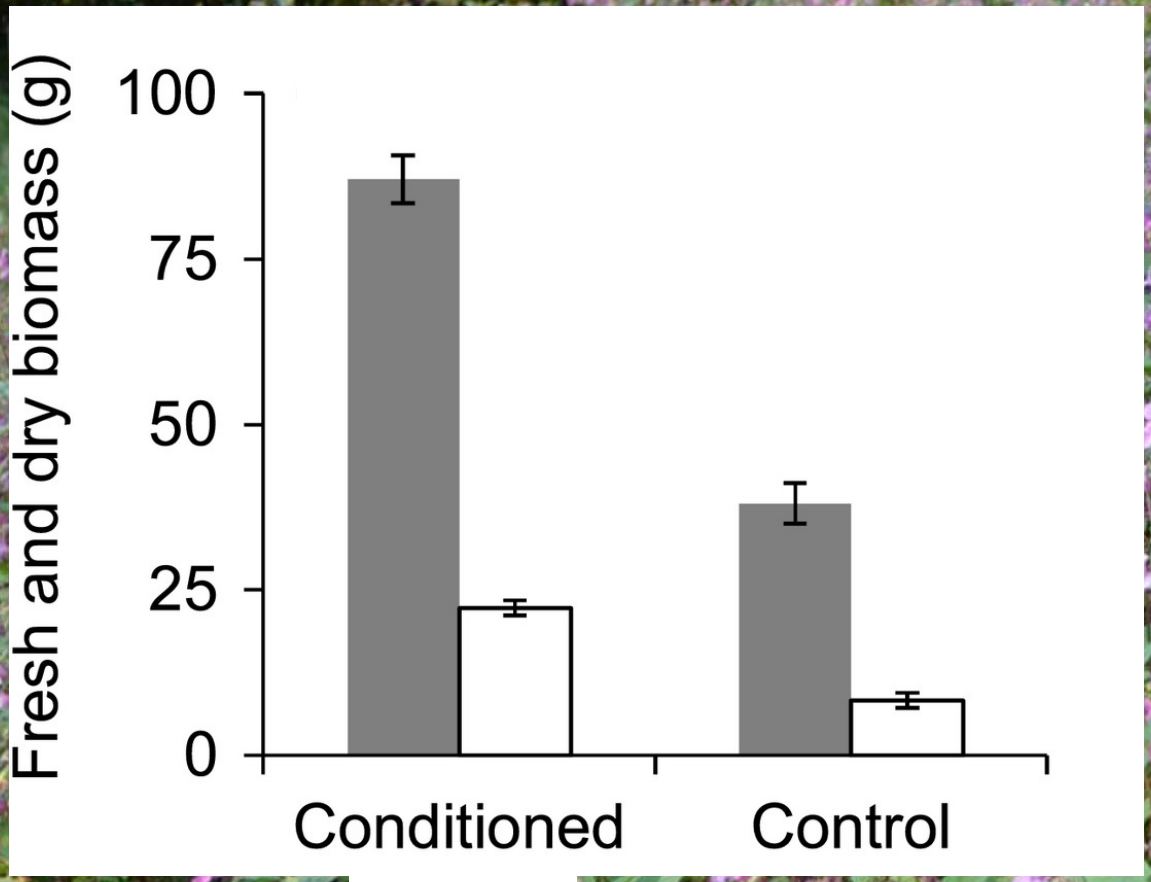

HB SOIL

Pattison et al. 2016 *Weed Research;* Pattison et al. 2017 *Bio. Invs.*

Managing this….?!

Dominant native & HB respond differently to local environmental conditions

Pattison et al. 2019 *Ecosystems*

Dominant native & HB respond differently to local environmental conditions

↑ moisture in spring reduces invasion abundance

overengineered channels (steep slopes) ↑ invasion abundance

Pattison et al. 2019 *Ecosystems*

HB in ancient woodlands: impacts and management options

HB in ancient woodlands: impacts and management options

Thank you!

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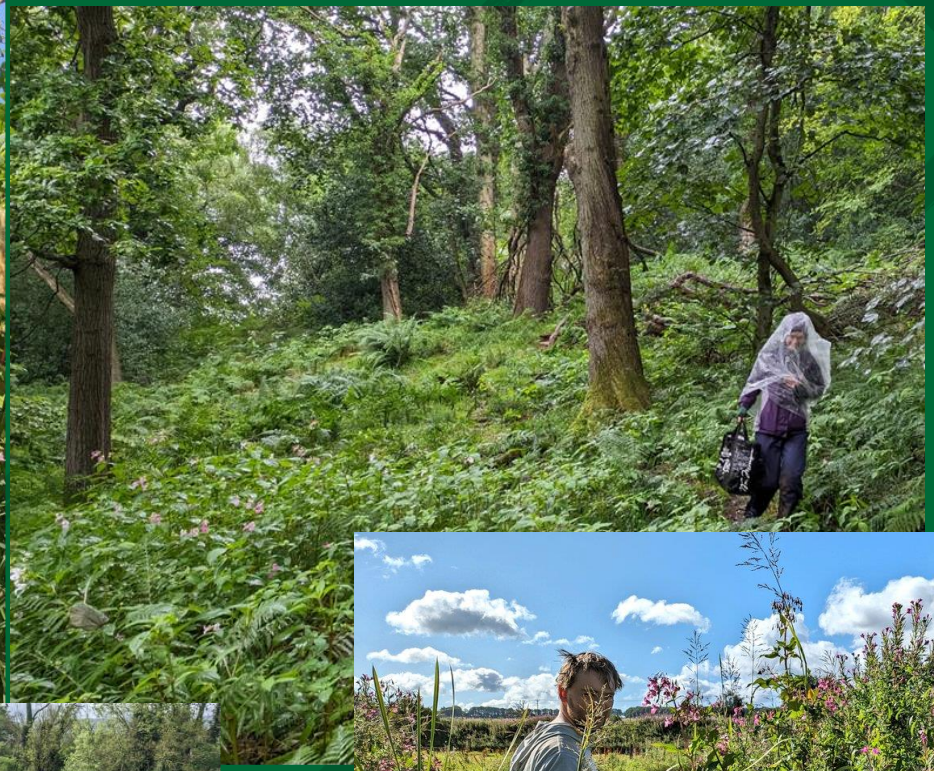

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BE THE DIFFERENCE

Cluster 2

Survey 1

Species	indicator_value
Agrostis stolonifera*	0.4979
Rhynchostegium riparioides***	0.4288
Equisetum arvense*	0.2705
Chiloscyphus polyanthos*	0.2654
Eleocharis palustris***	0.2317
Alopecurus geniculatus***	0.2225
Fissidens spp.***	0.143
Scapania spp.*	0.1402
Pohlia melanodon***	0.1347
Cratoneuron filicinum**	0.1296
Carex acuta***	0.1227
Carex acutiformis**	0.1111
Glyceria notata**	0.0698

Survey 2

Species	indicator_value
Deschampsia cespitosa***	0.4182
Persicaria hydropiper*	0.3692
Filipendula ulmaria**	0.3659
Galium palustre***	0.3378
Pellia epiphylla***	0.3319
Leptodictyum riparium***	0.3212
Senecio aquaticus***	0.3069
Sagina procumbens*	0.26
Stachys palustris***	0.24
Brachythecium rivulare*	0.2399
Thamnobryum alopecurum*	0.2214
Impatiens glandulifera***	0.2194
Stellaria uliginosa**	0.1634
Lunularia cruciata*	0.1452
Montia fontana*	0.1343
Rorippa sylvestris***	0.1284
Fallopia japonica***	0.0935
Epilobium brunnescens***	0.0791

Regardless of propagule diversity & abundance, invasion reduces native diversity