Measuring connectivity and applying the outputs: examples from Forest Research

Chloe Bellamy

Nature Improvement Areas - Best Practice Event - Connectivity

Birmingham Botanic Gardens, 24 February 2015

Parameterisation

- 'Core' habitat is identified and mapped

- The maximum dispersal distance is set

- The permeability of the matrix is set
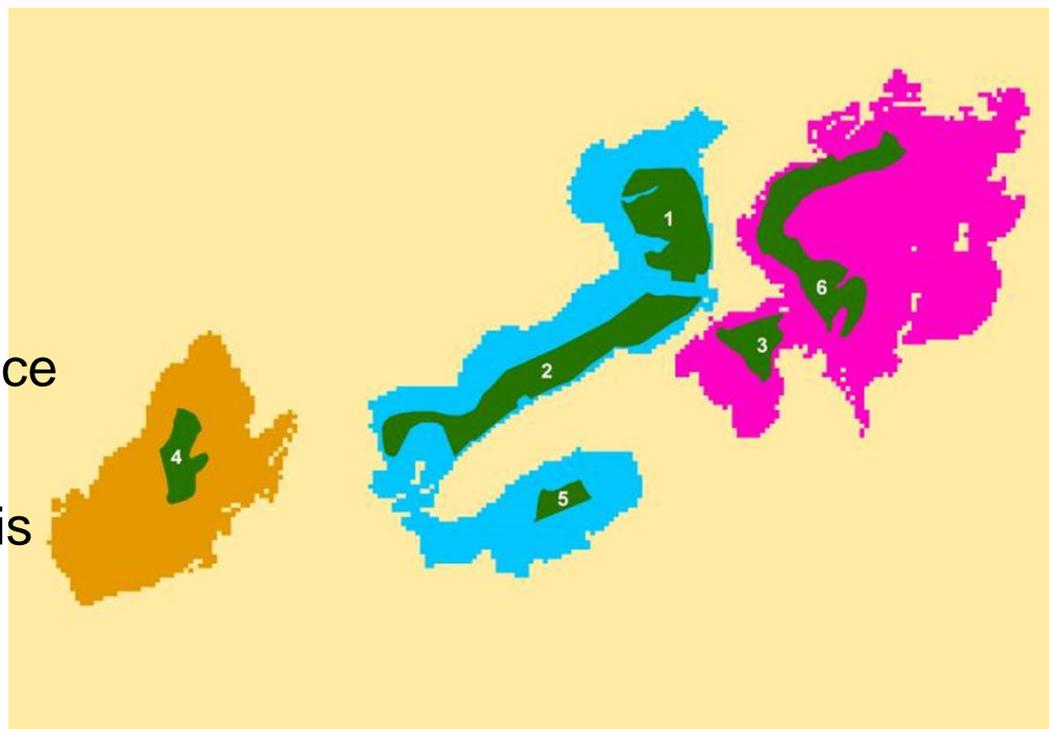
RESEARCH ARTICLE

Targeting and evaluating biodiversity conservation action within fragmented landscapes: an approach based on generic focal species and least-cost networks

Kevin Watts · Amy E. Eycott · Phillip Handley ·
Duncan Ray · Jonathan W. Humphrey ·
Christopher P. Quine

Filling evidence gaps with expert opinion: The use of Delphi analysis in least-cost modelling of functional connectivity

Amy E. Eycott[a,*], Mariella Marzano[b], Kevin Watts[a]

[a] Forest Research, Alice Holt Lodge, Farnham, Surrey GU10 4LH, England, UK
[b] Forest Research, Northern Research Station, Roslin, Midlothian EH25 9SY, Scotland, UK

Forest Research

Action on the ground:

1. Protect and manage

2. Improve/manage

3. Restore

4. Create habitats
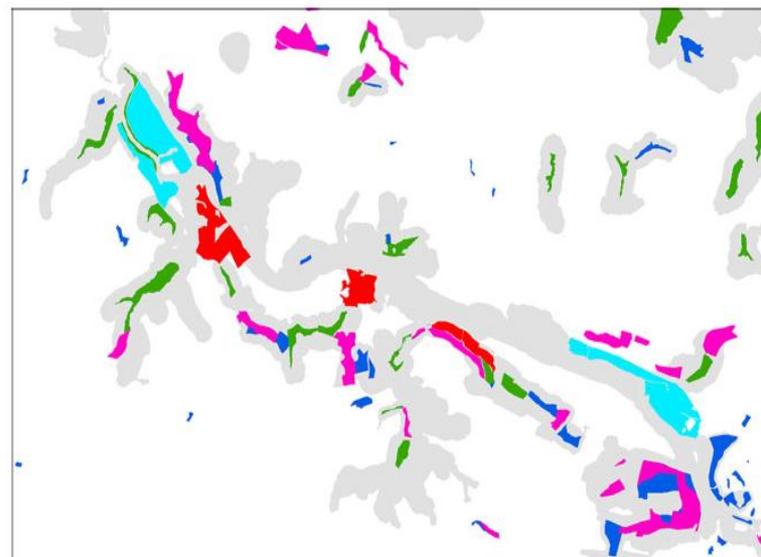
Conservation actions

0   1.5   3 Kilometers   N

Existing focal network

1. Protect/mange high quality woodland (86 ha - all scenarios)

2. Restore woodlands (129 ha - all scenarios)

3. Improve woodlands (70 ha - all scenarios)

4. Improve matrix permeability (52 ha - shown for targeted scenario)

5. Create new woodlands (89 ha - shown for targeted scenario)

FORUM

A decision framework for considering climate change adaptation in biodiversity conservation planning

Tom H. Oliver[1]*, Richard J. Smithers[2], Sallie Bailey[3], Clive A.Walmsley[4] and Kevin Watts[5]

[1]Centre for Ecology & Hydrology, Maclean Building, Benson Lane, Crowmarsh Gifford Wallingford, Oxfordshire, OX10 8BB, UK; [2]AEA Technology plc, The Gemini Building, Fermi Avenue, Harwell, Didcot, OX11 0QR, UK; [3]Forestry Commission, Silvan House, 231 Corstorphine Road, Edinburgh, EH12 7AT, UK; [4]Countryside Council for Wales, Maes-Y-Ffynnon, Penrhos Garnedd, Bangor, LL57 2LQ, UK; and [5]Forest Research, Alice Holt, Farnham, Surrey, GU10 4LH, UK

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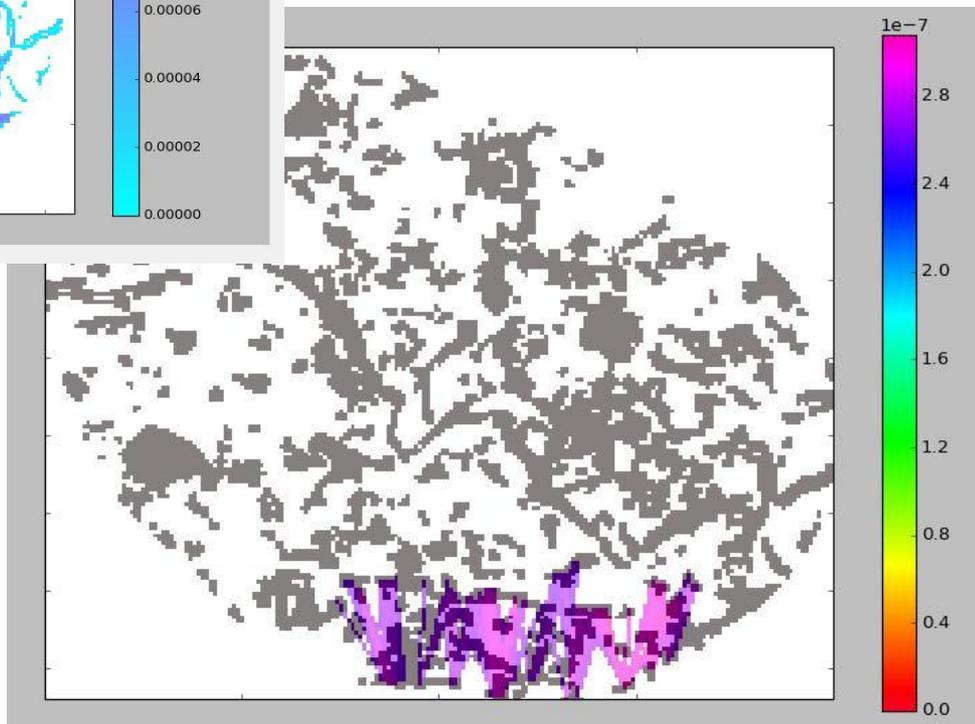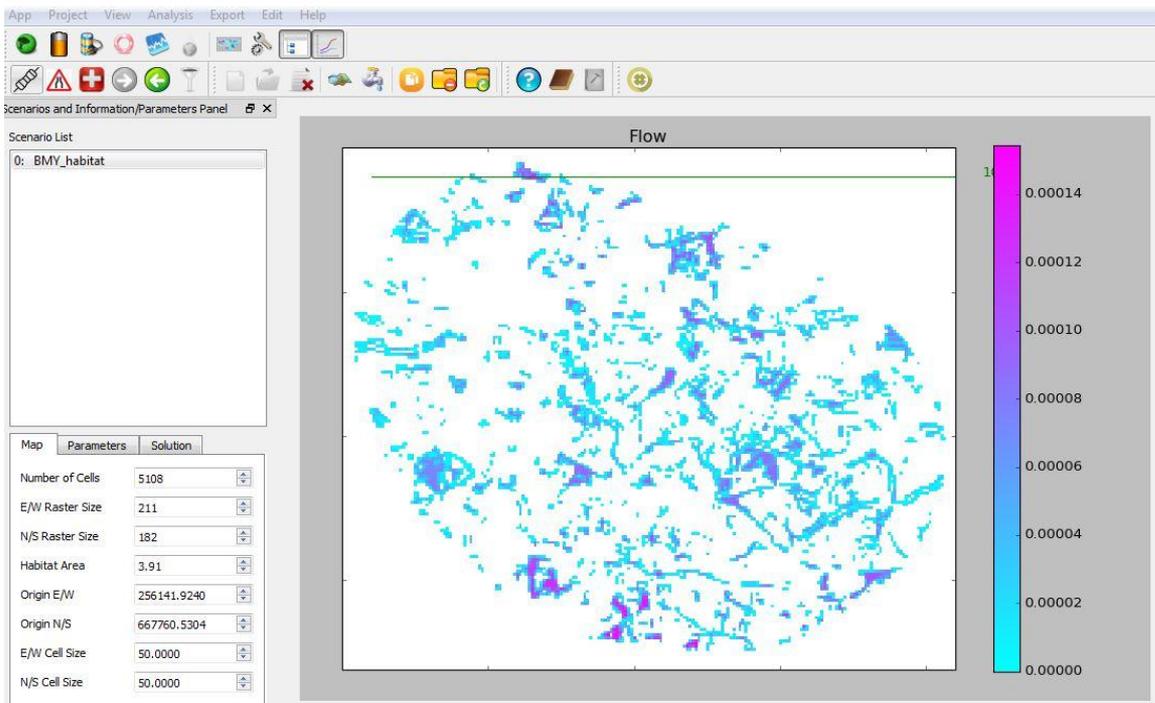
The Land Use and Ecosystem Service Research Group at FR are developing a data platform that:

- Provides detailed information on the spatial distribution, extent and ecological connectivity of important habitats

- Focuses on UK priority habitats and terrestrial EPS, which are protected by law and highly sensitive to environmental change and disturbance

- Uses national datasets

Standardised approach & lower cost service

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Connectivity indicator
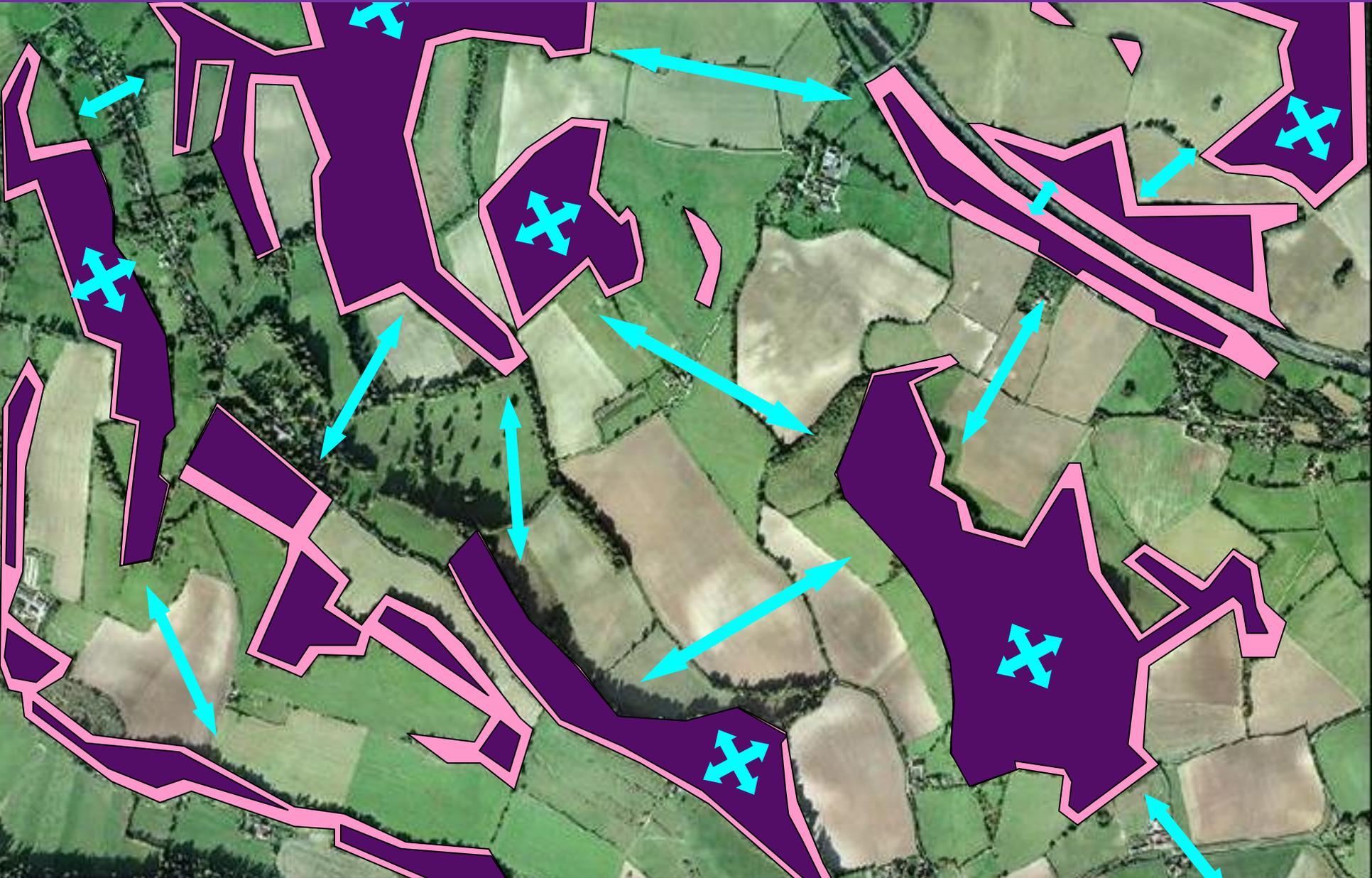
Connectivity within & between patches

UK Biodiversity Indicators in Your Pocket 2013
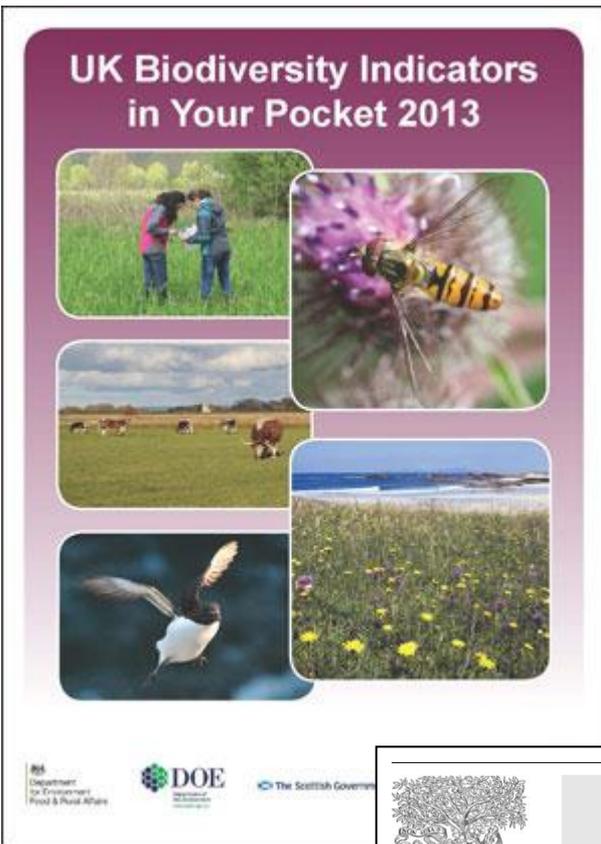
Change in woodland connectivity & area in GB between 1990 and 2007
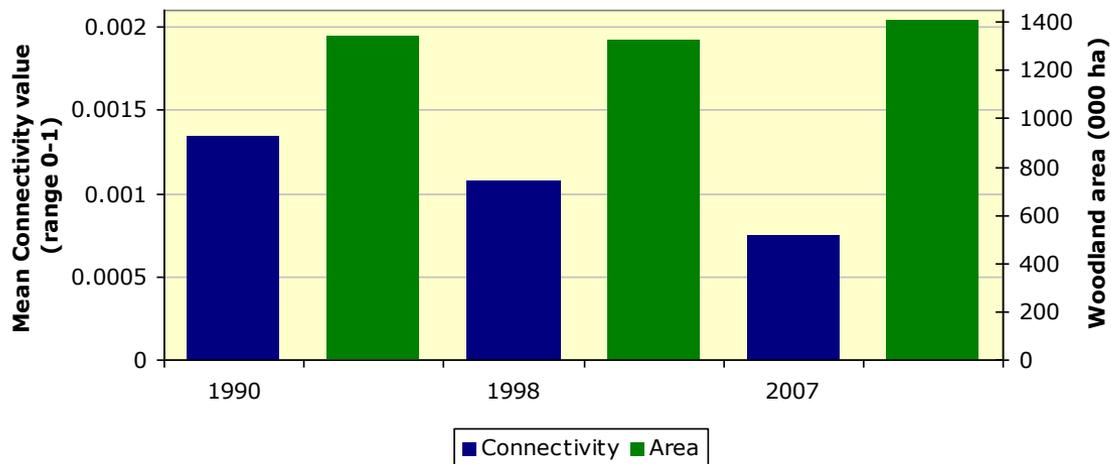
Contents lists available at ScienceDirect

Ecological Indicators

ELSEVIER

journal homepage: www.elsevier.com/locate/ecolind

Short communication

Developing a functional connectivity indicator to detect change in fragmented landscapes

Kevin Watts [*], Phillip Handley

Forest Research, Alice Holt, Farnham, Surrey, GU10 4LH England, UK

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		METRIC	Bigger/ Better	More	Joined
HABITAT	**COHERENCE**	Patch location score			■
		Interconnectivity			■
		Proportional cover		■	
	RESILIENCE	Patch size	■		
		Shape index	■		
		Naturalness	■		
		Edge naturalness	■		
		Proportion designated	■		
NETWORK	**COHERENCE**	Network area	■		
		Proportion of core area per network		■	
		Sum of interconnectivity per network			■
		Sum of intra-connectivity per network	■	■	
		Change in interconnectivity per network with stepping stones			■
	RESILIENCE	Average area weighted resilience score per network	■	■	

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Ecological resilience of Fen, Marsh and Swamp (FMS) habitat and networks in the Brue Valley

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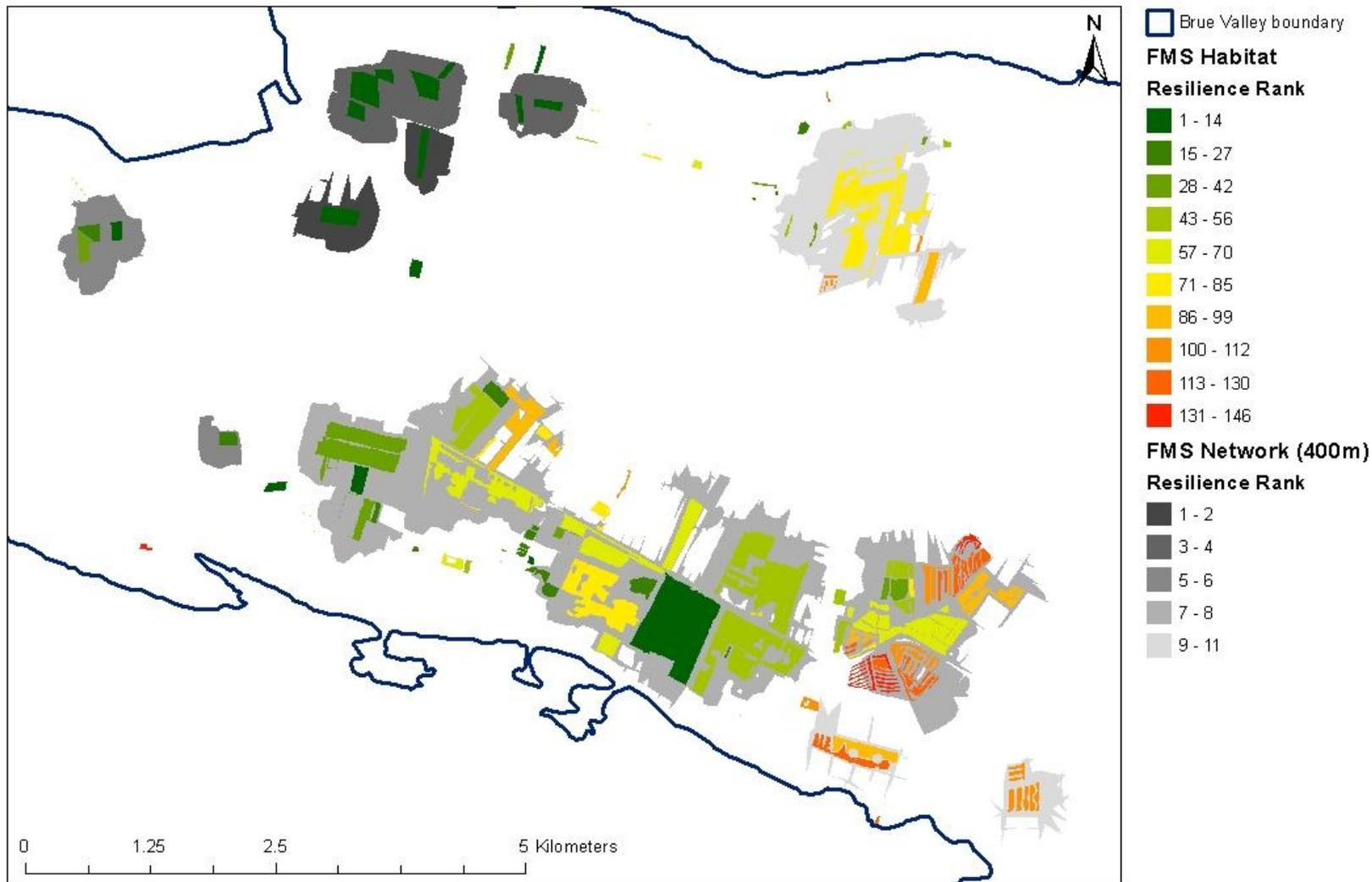
Parametrisation using real world data

Core patch size (km2)

20   0

Separate core foraging patches

Separate core foraging patches

0   0.75 1.5   3   km

OPEN ACCESS Freely available online   PLOS ONE

Defining Landscape Resistance Values in Least-Cost Connectivity Models for the Invasive Grey Squirrel: A Comparison of Approaches Using Expert-Opinion and Habitat Suitability Modelling

Claire D. Stevenson-Holt[1]*, Kevin Watts[2], Chloe C. Bellamy[3], Owen T. Nevin[4], Andrew D. Ramsey[5]

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Woodland **C**reation &
Ecological **N**etworks

Ecological reality

Structural   **Functional**

Patch and landscape metrics

Parameterisation

species data & spatial data

Spatially Explicit Population Models

Least-cost networks   Connectivity indicator

Low   Data, expertise & time requirements   **High**

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- Underlying methods
    - Ecological realistic?
    - Standardised and repeatable?

- Parameterisation: use of expert opinion, Delphi analysis, real world data, or other?

- Outputs
    - Intuitive?
    - Provide targeted information?
    - Comparable?

- Data, software, IT, expertise and time requirements

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