

Habitat Networks: linking across scales and land-uses

Centre for Human and Ecological Sciences
Forest Research

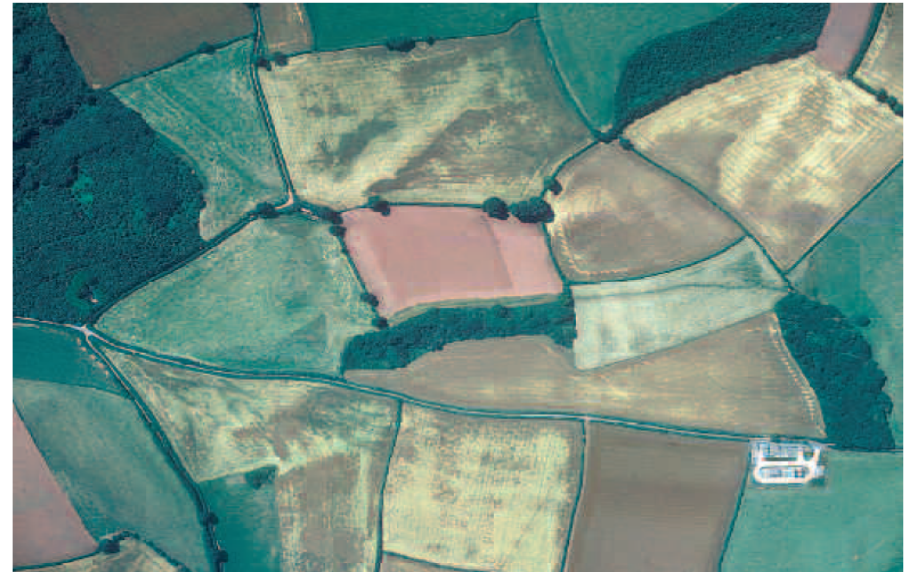
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Scotland's changing rural biodiversity: policy and action needs
Battleby, 13 May 2009

Habitat Networks: linking across scales and land-uses

- Policy and action needs
- Scale and land use – a landscape ecology problem
- Land use planning – woodland & open habitat, people, and climate change adaptation
- Monitoring – UK biodiversity role
- Conclusions

Aerial photograph showing broadleaved woodland (very dark green) within a highly fragmented agricultural landscape.



- International

Convention on Biological Diversity - In April 2002, the Parties to the Convention committed **to achieve by 2010 a significant reduction of the current rate of biodiversity loss**

- European

European biodiversity Action Plan - Halting the loss of Biodiversity by 2010 - and beyond, sustaining ecosystem services for human well-being

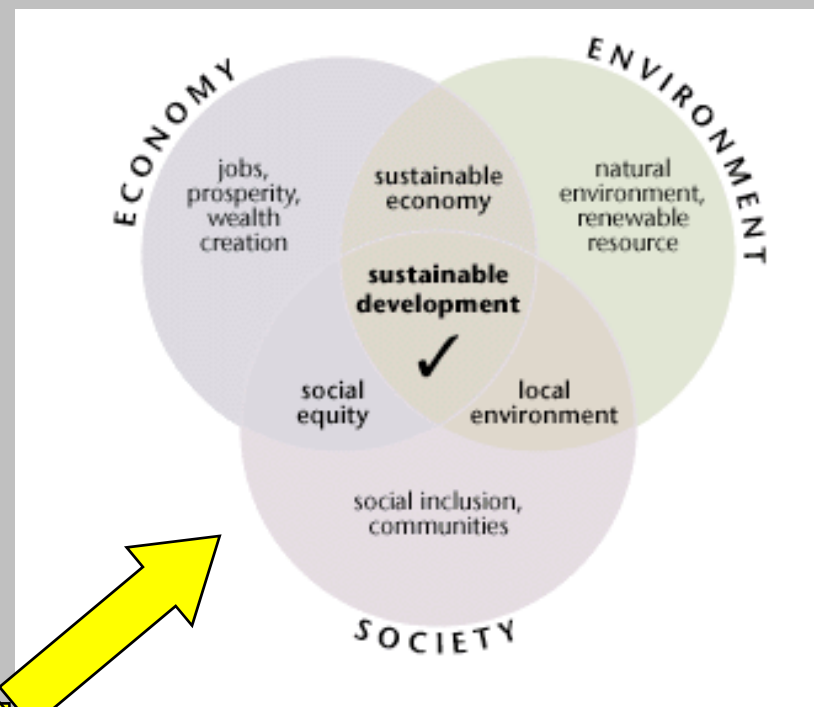
- National

SG aspiration - Scotland to be a world leader in biodiversity conservation where everyone is involved and everyone benefits

Nature Conservation (Scotland) Act 2004 – public bodies have a “duty to further the conservation of biodiversity in Scotland”

Planning our needs without compromising the needs of future generations

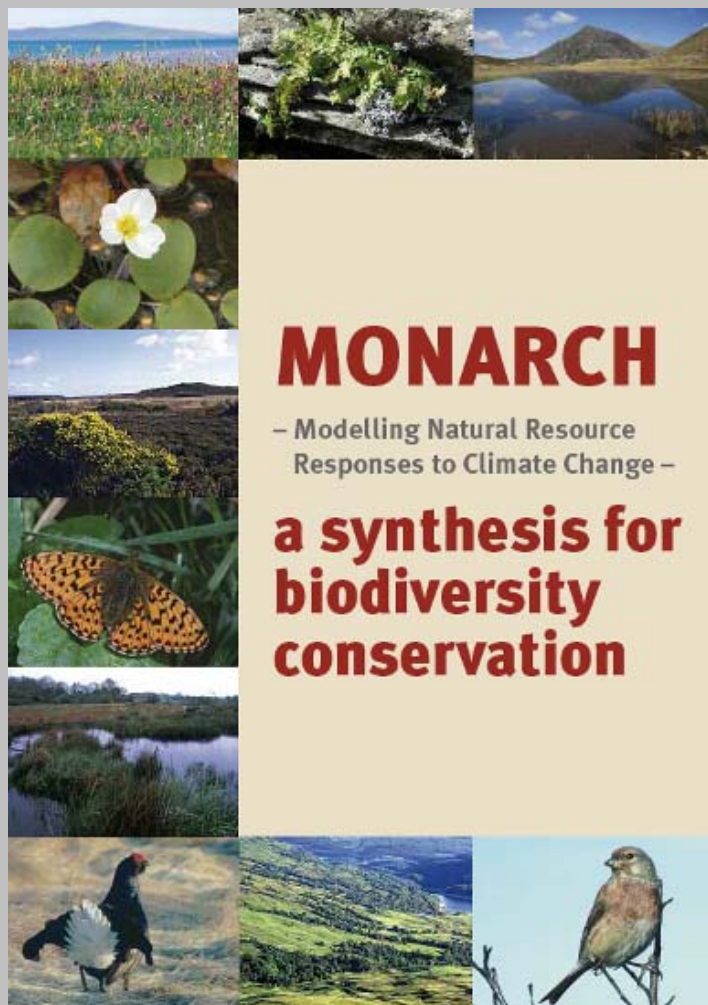
- What are the needs of future generations?
- Sustainable local economy
- Diverse & stimulating environment
- Social inclusion



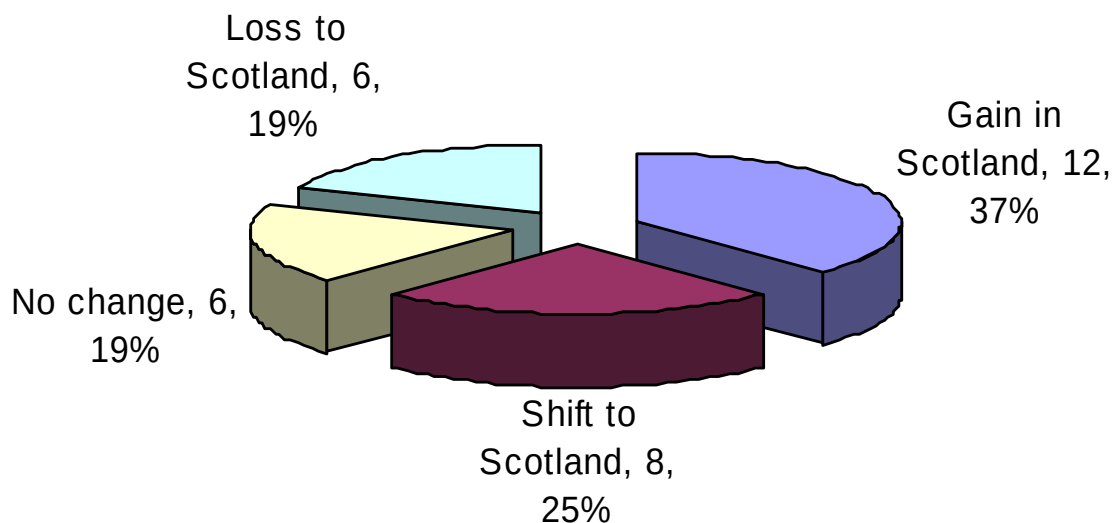
Climate change

Sustainable and adaptive development

Development that facilitates economic, environmental and social adaptation to climate change



Impact of climate change on the 32 MONARCH species in Scotland



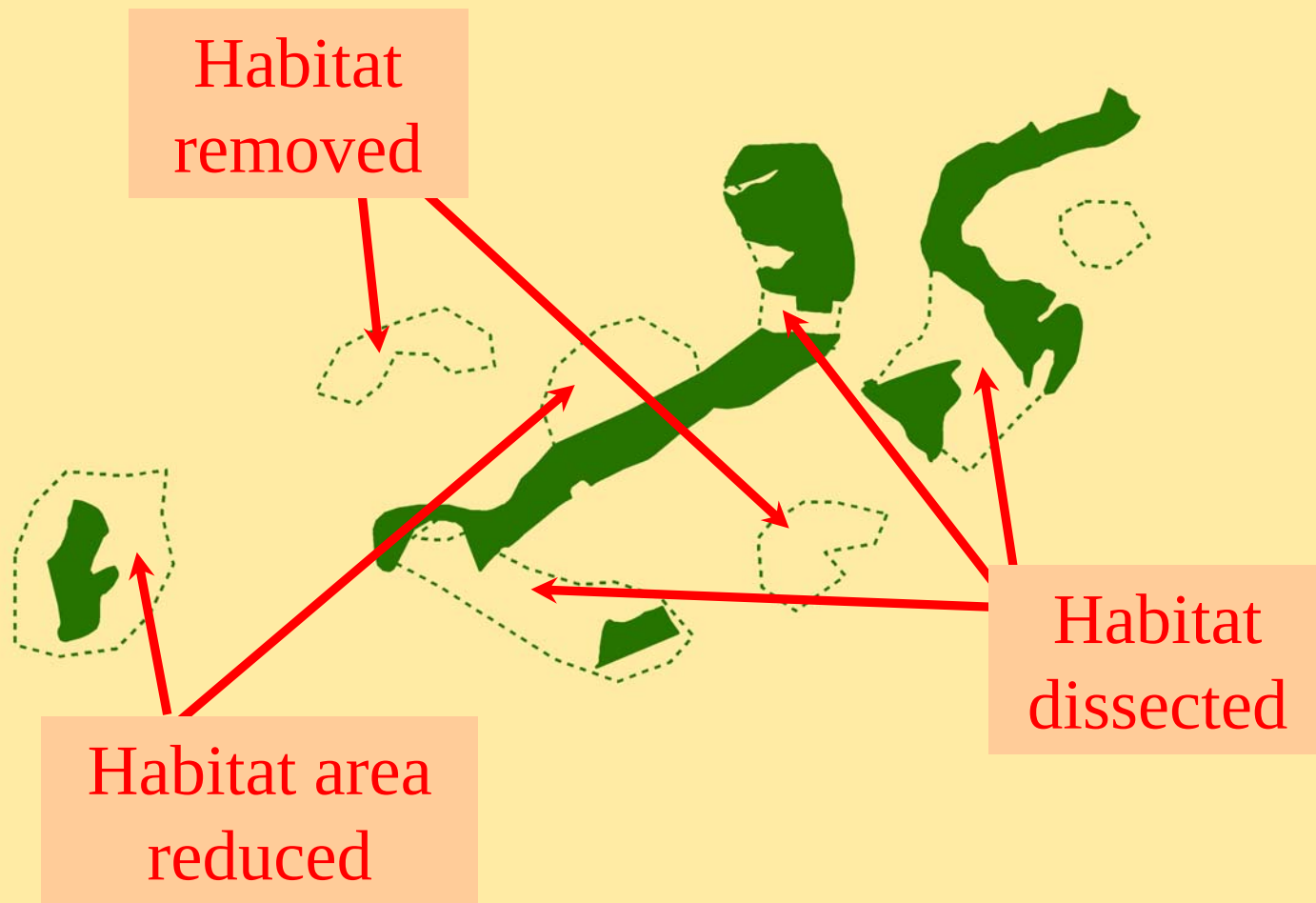
From - Walmsley et al (2007)

‘the study of the interactions between the temporal and spatial aspects of a landscape and its flora, fauna and cultural components’

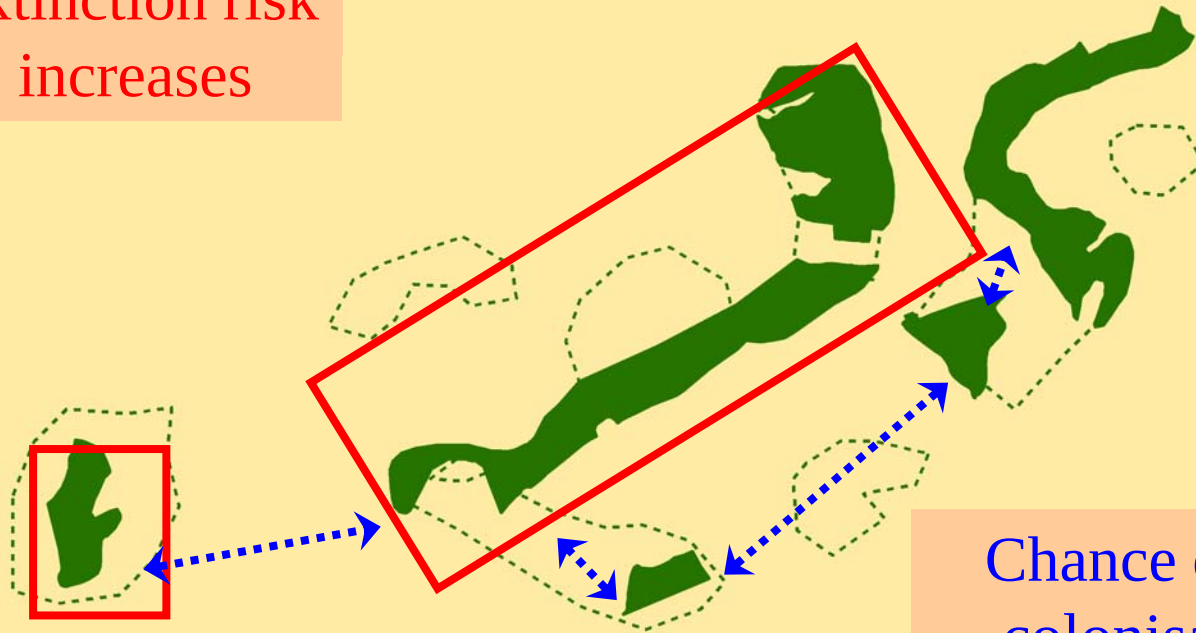
(Dover and Bunce, 1998)

- Structure/pattern - *composition & configuration*
- Function/process - *interactions, flow, movement*
- Change in space and time
 - NOTE: Landscape scale is linked to the scale of the study – e.g woodland, catchment, region, country...

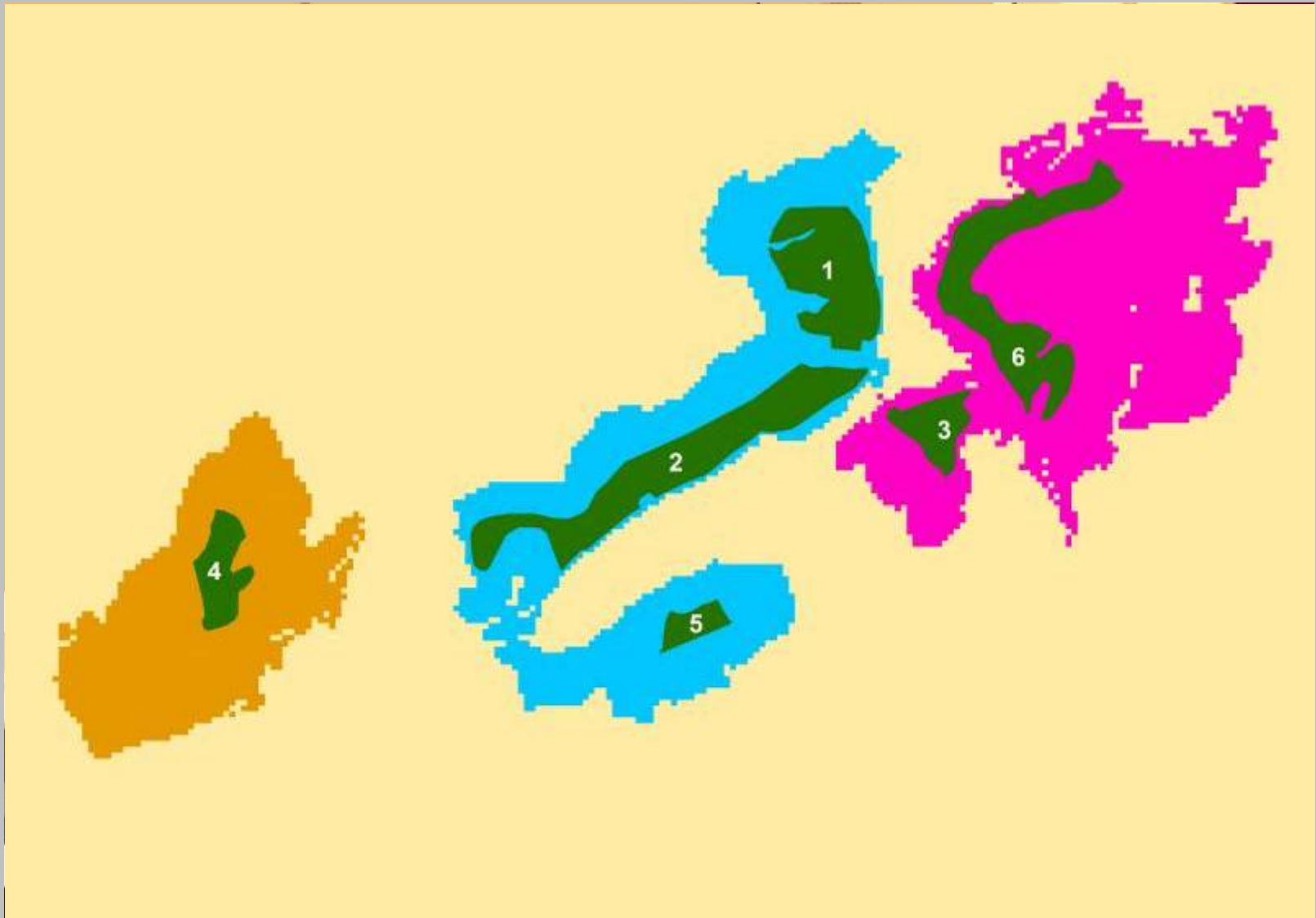
- ***Fragmented biodiversity resource***
 - Site-based conservation management (declines)
= *landscape-scale strategy & management required*
- ***Planning sustainable landscapes***
 - Sustainable development/sustainable forestry
 - Multiple objectives/integrated planning
 - Climate change
= *landscape-scale planning required*
- ***Framework for landscape-scale action***
 - Tool to guide/inform action rather than prescribe action
 - Integrated shared action better than random ad hoc action
 - Acknowledges the matrix has an impact on biodiversity



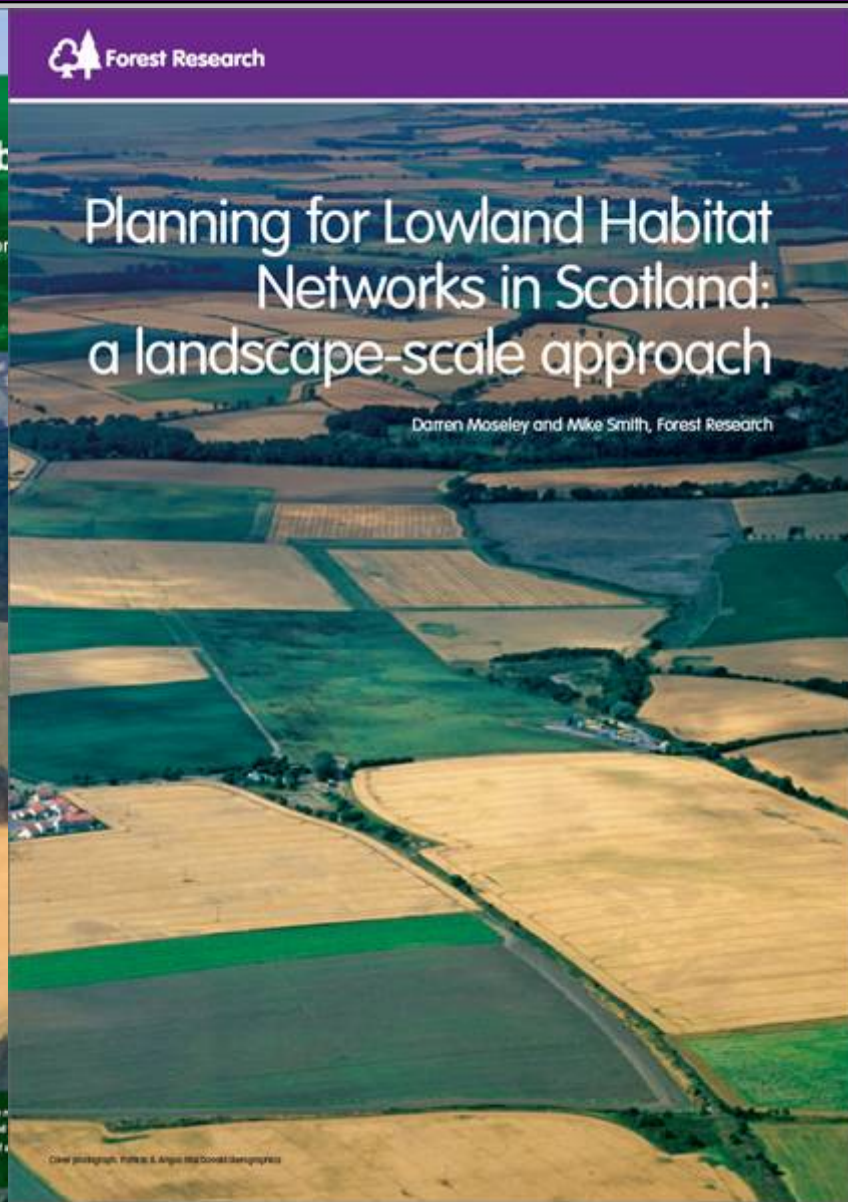
Local
extinction risk
increases



Chance of re-
colonisation
declines

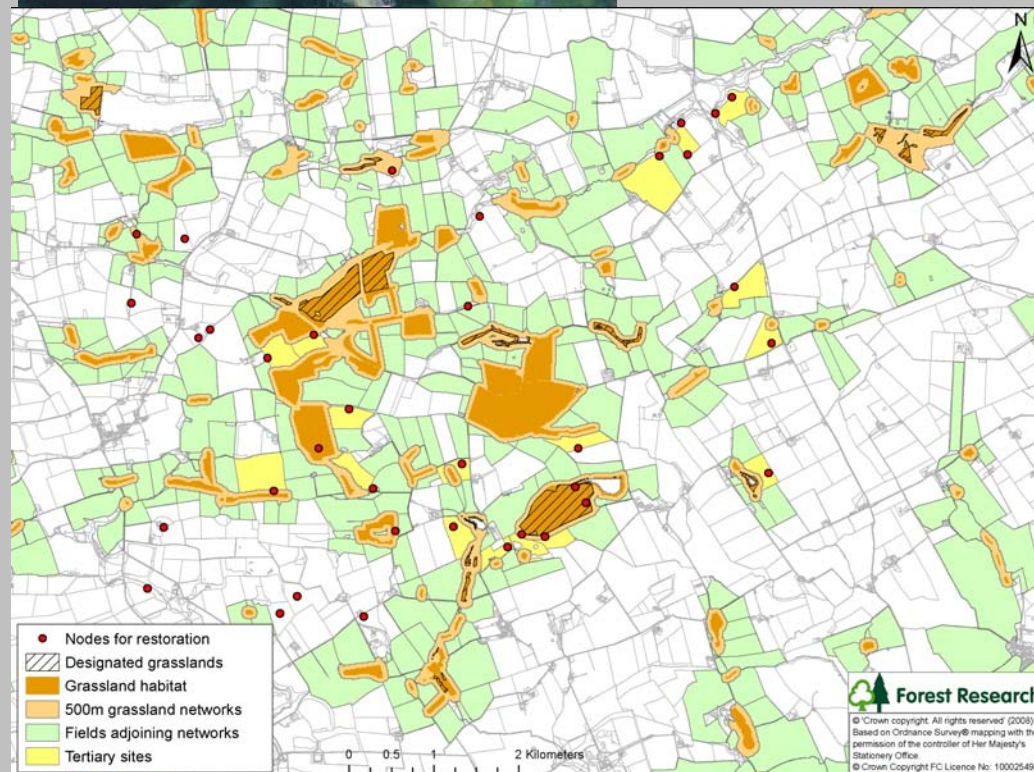


- Targeting woodland expansion in Scotland
- Reduce fragmentation
- Link designated woodland
- Improve dispersal for woodland species
- Adaptation to allow species to adjust to shifts in their climate range
- Prioritise and target adaptation management



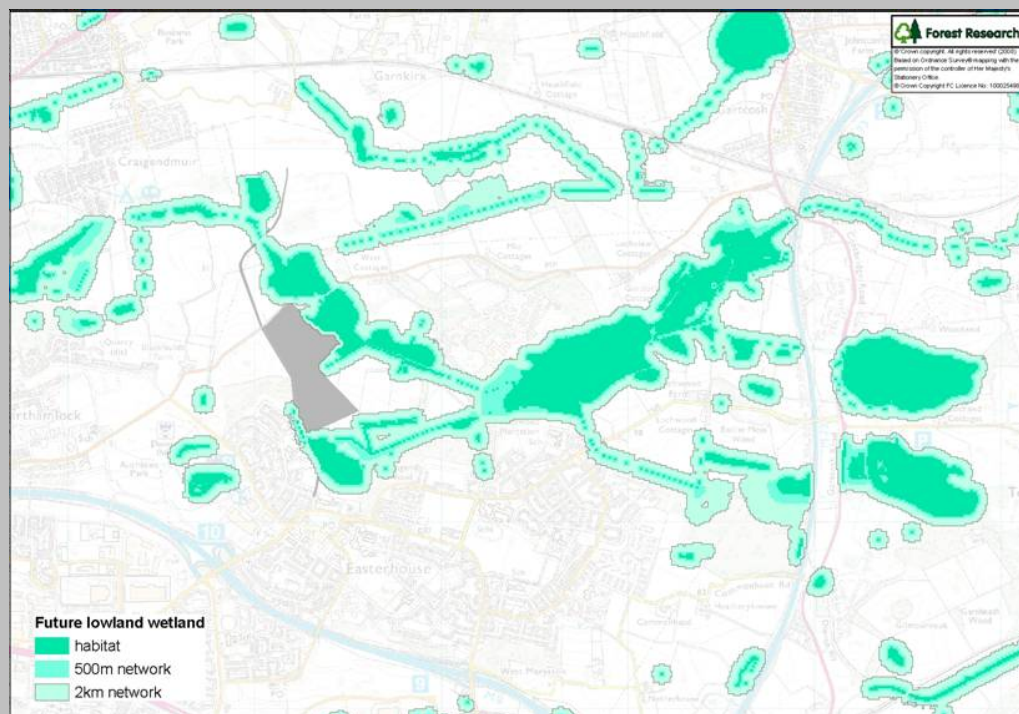
Spatial targeting of agri-environment incentives under SRDP

- Reverse grassland fragmentation
- Northern brown argus butterfly – focal species
- Cores sites – (SSSI) protection maintenance
- Secondary sites – restoration of remnants
- **Tertiary sites – Restoration of degraded habitat – selected through nodes for network consolidation**
 - Historical records & coincidence mapping



Glasgow & Clyde Valley Green Network Partnership

- Area for development in structure plan - growth corridor: Robroyston to Coatbridge
- Plan for 1000 hectares greenspace
- Network of wetland and water bodies
- A Corridor project
 - Community needs and opportunities
 - Attract investment
 - Secure natural heritage



Integration of green space for people with habitat networks for biodiversity

Green space
in south-west
Edinburgh



0 125 250 500 Meters



Legend

 accessible_greenpace

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Integration of green space for people with habitat networks for biodiversity

Network improvement opportunities for low range users : targeting deprived areas

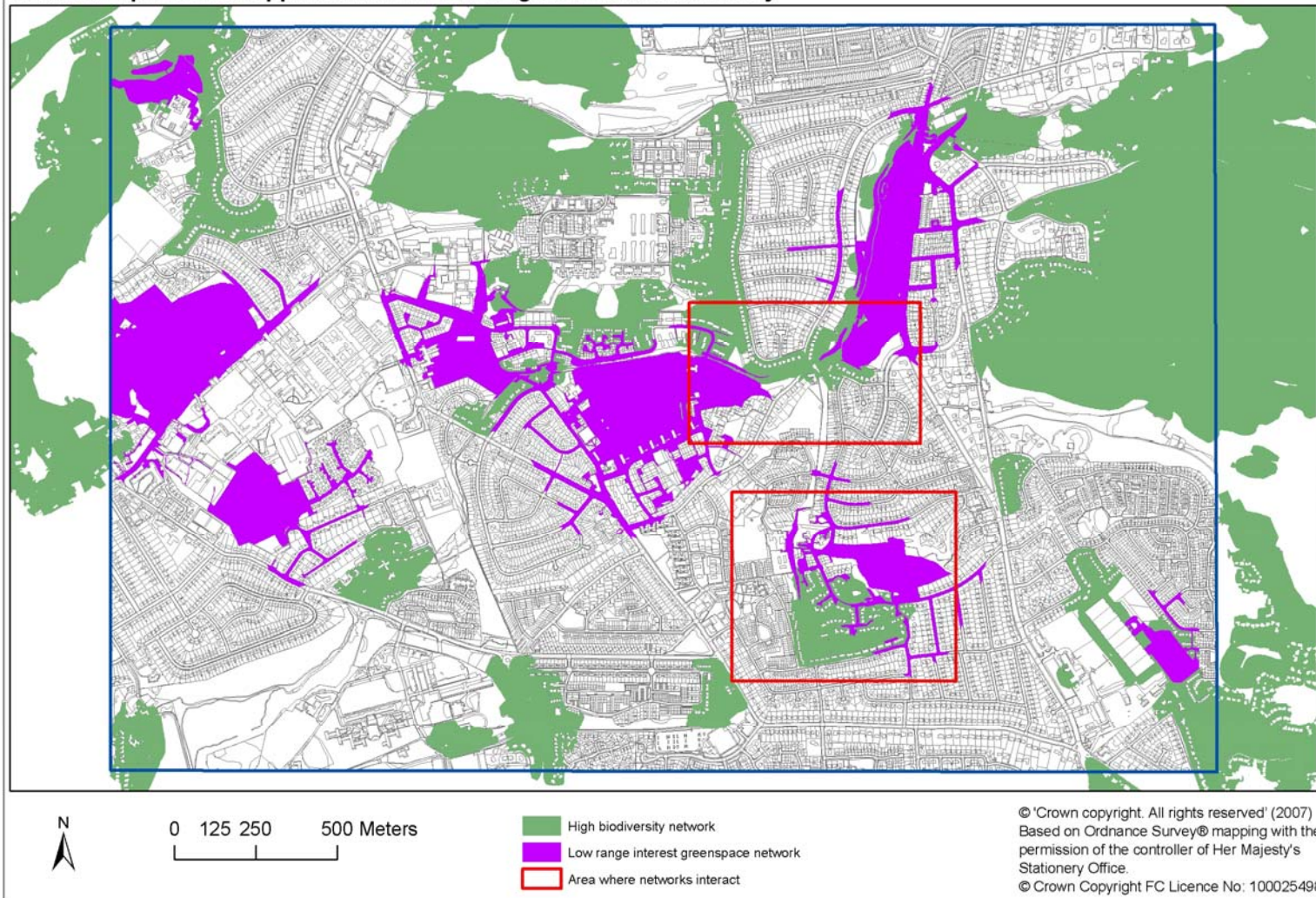


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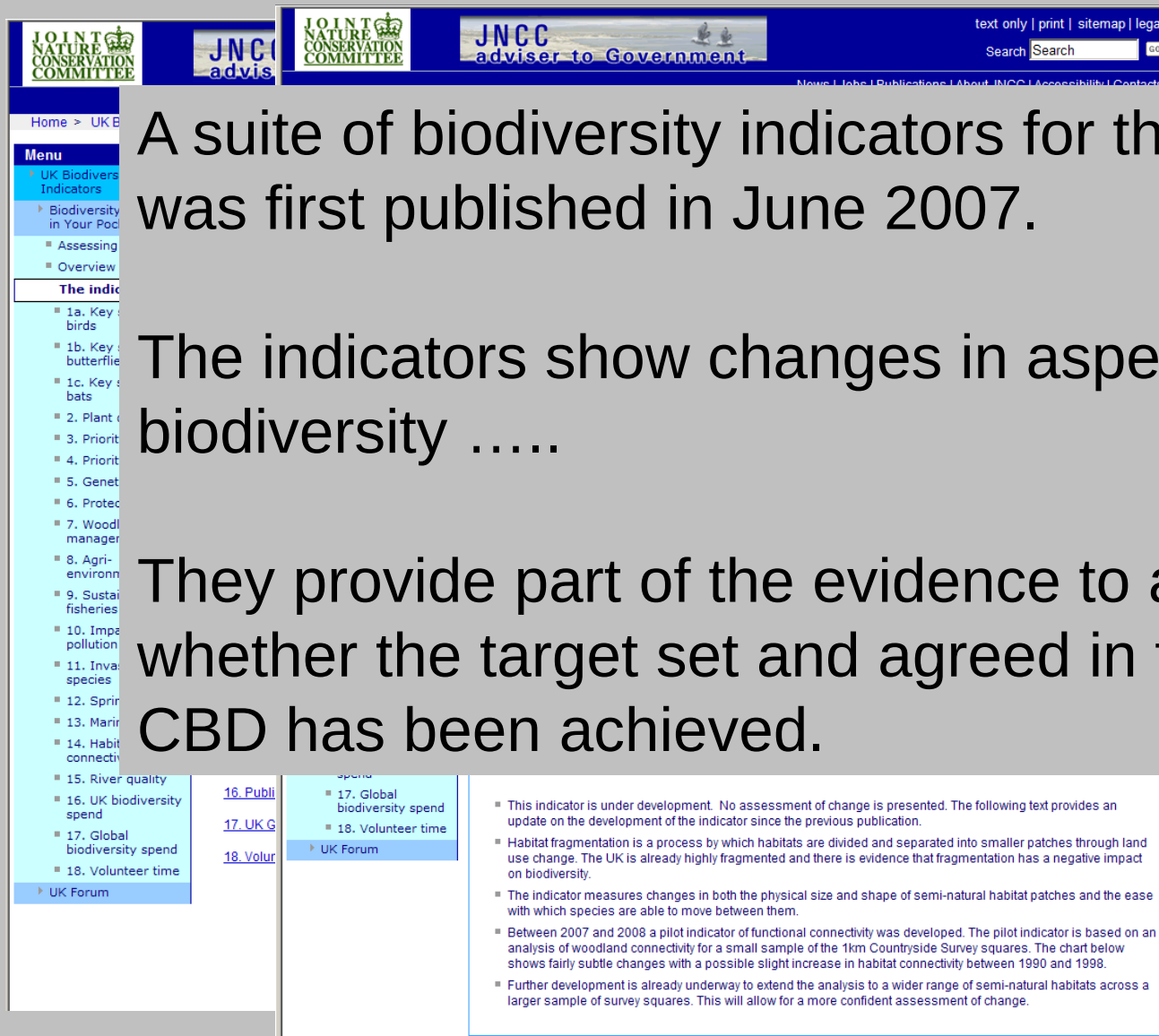
Social deprivation in south-west Edinburgh

Integration of green space for people with habitat networks for biodiversity

Network improvement opportunities for low range user and biodiversity



Linking high biodiversity green space and people



The screenshot shows the JNCC Biodiversity Indicators website. The header includes the JNCC logo, the text 'JNCC adviser to Government', and navigation links for 'text only', 'print', 'sitemap', and 'legal'. A search bar is also present. The main content area is titled 'A suite of biodiversity indicators for the UK was first published in June 2007.' and lists 18 indicators. The indicators are: 1a. Key birds, 1b. Key butterflies, 1c. Key bats, 2. Plant, 3. Priority, 4. Priority, 5. Genetic, 6. Protected, 7. Woodland, 8. Agricultural, 9. Sustainable, 10. Impacts, 11. Invasive, 12. Spring, 13. Marine, 14. Habitat, 15. River quality, 16. UK biodiversity spend, 17. Global biodiversity spend, 18. Volunteer time, and UK Forum. The 'UK Forum' link is highlighted in blue. The '16. Publi' link is also highlighted in blue. The '17. UK G' link is also highlighted in blue. The '18. Volun' link is also highlighted in blue. The 'UK Forum' link is also highlighted in blue. The '16. Publi' link is also highlighted in blue. The '17. UK G' link is also highlighted in blue. The '18. Volun' link is also highlighted in blue. The 'UK Forum' link is also highlighted in blue.

A suite of biodiversity indicators for the UK was first published in June 2007.

The indicators show changes in aspects of biodiversity

They provide part of the evidence to assess whether the target set and agreed in the CBD has been achieved.

- 1a. Key birds
- 1b. Key butterflies
- 1c. Key bats
- 2. Plant
- 3. Priority
- 4. Priority
- 5. Genetic
- 6. Protected
- 7. Woodland
- 8. Agricultural
- 9. Sustainable
- 10. Impacts
- 11. Invasive
- 12. Spring
- 13. Marine
- 14. Habitat
- 15. River quality
- 16. UK biodiversity spend
- 17. Global biodiversity spend
- 18. Volunteer time
- UK Forum

This indicator is under development. No assessment of change is presented. The following text provides an update on the development of the indicator since the previous publication.

Habitat fragmentation is a process by which habitats are divided and separated into smaller patches through land use change. The UK is already highly fragmented and there is evidence that fragmentation has a negative impact on biodiversity.

The indicator measures changes in both the physical size and shape of semi-natural habitat patches and the ease with which species are able to move between them.

Between 2007 and 2008 a pilot indicator of functional connectivity was developed. The pilot indicator is based on an analysis of woodland connectivity for a small sample of the 1km Countryside Survey squares. The chart below shows fairly subtle changes with a possible slight increase in habitat connectivity between 1990 and 1998.

Further development is already underway to extend the analysis to a wider range of semi-natural habitats across a larger sample of survey squares. This will allow for a more confident assessment of change.

Habitat Networks: linking across scales and land uses

- Involve and promote stakeholder discussion of integrated land use planning and decision making
- Target habitat creation and restoration to improve biodiversity at whatever landscape scale is appropriate
- Deliver more high quality green space and encourage community use
- Promote green space benefits (including the value of biodiversity) to local communities and society
- Adaptation measure to improve species dispersal in response to climatic shifts
- Meet SG policy objectives - integrated land use planning - 'everyone is involved and everyone benefits'
- Habitat connectivity will be measured as a UK Biodiversity Indicator - commitment to CBD