

Climate Change Adaptation Projects



National biodiversity climate change vulnerability
model

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Climate Change Vulnerability Assessments - Aims



- Advance our approach to climate change adaptation
- Prepare for long term changes
- Identify most vulnerable assets
 - Target resources to address sustainable climate change adaptation
 - Inform spatial planning, land management
 - Inform objective setting e.g. National Character Areas



National Climate Change Vulnerability Assessment - Approach



- Initially a regional GIS grid model used to undertake spatial analysis to assess regional biodiversity climate change vulnerability
- National roll-out
- IPCC Vulnerability Model:
 - What we have/what we **value** (assets)
 - Asset **sensitivity and exposure** (UKCP09) to climate change
 - **Adaptive capacity** (connectivity, topography and management)

= vulnerability
- Pilot areas for GIS products for our partners



6 Principles – Inform Adaptive Capacity



Method based on Defra document 'Conserving Biodiversity in a Changing Climate' - the 'Hopkins Principles':

1. Conserve existing biodiversity
2. Reduce sources of harm not linked to climate
3. Develop ecologically resilient and varied landscapes
4. Establish ecological networks through habitat protection, restoration and creation
5. Make sound decisions based on analysis
6. Integrate adaptation and mitigation measures into conservation management, planning and practice



1. **Conservation value** – BAP, national designation, international designation
 - *Rationale - Conserve Protected Areas and other high quality habitats (HP1a)*
2. **Sensitivity to climate change** – H/M/L classification based on England Biodiversity Strategy 'Towards Adaptation to Climate Change' (Mitchell et al 2007) 'risk of direct impact' classifications
 - *Rationale - Habitats highly sensitive to climate change variables are at most risk*

Adaptive capacity – Physical environment

3. **Structural connectivity** – habitat proximity and landscape permeability
 - *Rationale - Develop ecologically resilient and varied landscapes (HP3)*
4. **Topographic heterogeneity** – variation of height and aspect
 - *Rationale - Develop ecologically resilient and varied landscapes (HP3)*

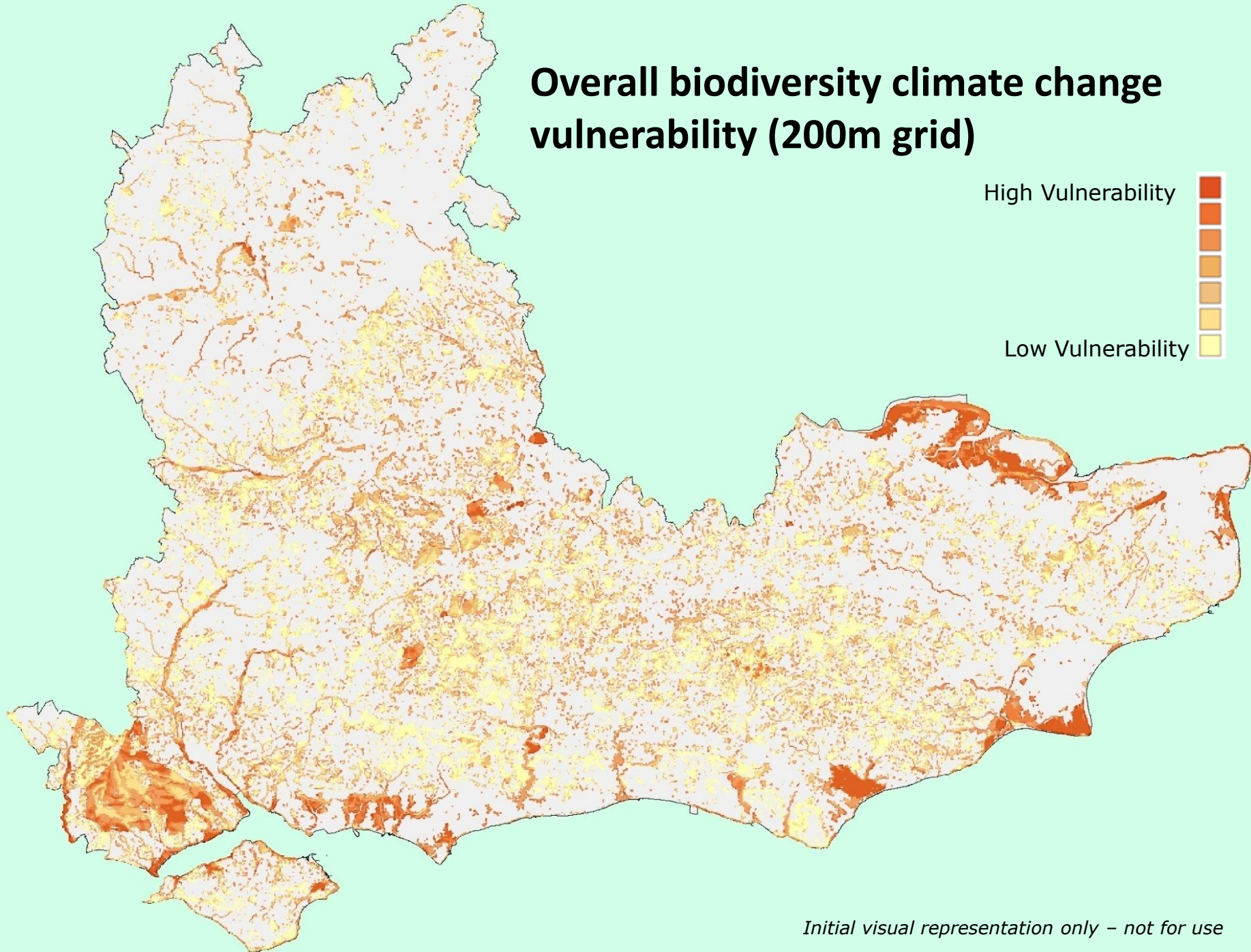
Adaptive capacity – Management

5. **Management of current sources of harm** – current management measures that address top sources of harm for BAP habitats (Y/N score)
 - *Rationale - Reduce sources of harm not linked to climate (HP2)*



Results

Overall biodiversity climate change vulnerability (200m grid)



High Vulnerability



Low Vulnerability

Initial visual representation only – not for use

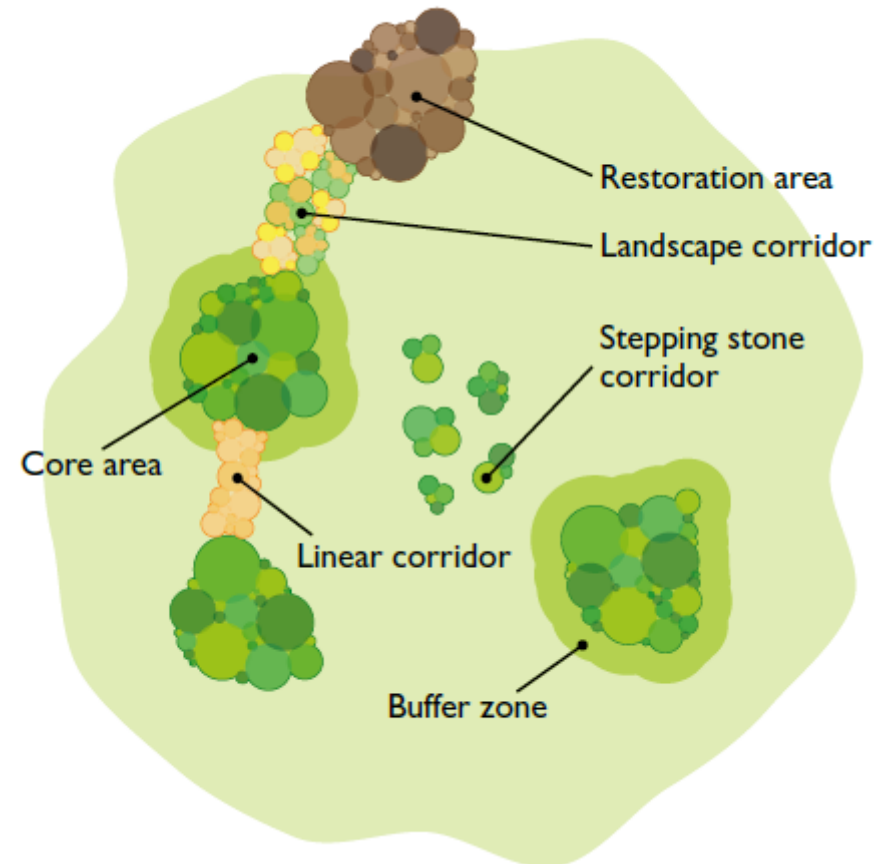


Products and uses

- Use model to help target adaptation action
- Interrogate grid squares to highlight which adaptive capacity variables are low and investigate practical solutions (management and connectivity)
- Input to focus partnership work
 - Discussion of local biodiversity climate change adaptation priorities
 - Ground-truthing assessment using local data and knowledge
 - Alignment with Biodiversity Opportunity Areas

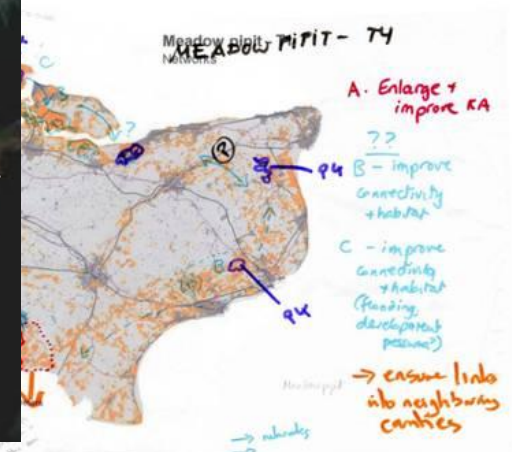
- **Better**
 - **Bigger**
 - **More**
 - **Joined**
 - **More permeable landscape**
- We can use the climate change vulnerability model to provide products that help us decide where we prioritise action using this hierarchy.

The components of ecological networks



Interpretation

- Partners will then make further prioritisation decisions on where to carry out adaptation action based on the model tools and local data and local knowledge of opportunities and constraints etc.
- For example the 'joined' tool will show the vulnerability of squares within BOAs with low structural connectivity, partners will then use the data to inform decisions on which BOAs to set up habitat creation projects.



- Derived, simplified dataset from model
- This will enable you to run queries, to select certain squares to highlight e.g. all squares with a water quality issue.
- Documentation required to interpret GIS (sit with the GIS team)
- Climate change GIS model grid squares that fall within appropriate boundaries and Biodiversity Opportunity Areas.
 - Focus this further to squares where interventions are prioritised (the Lawton tools mentioned above), for this we would provide:
 - Overall vulnerability, all habitats
 - Habitat sensitivity and exposure classification
 - Conservation value scores
 - Connectivity - prioritised squares
 - Topographic heterogeneity
 - Management scores
- (i.e. squares would be able to be interrogated)

- Contract underway for creation of national model (start 1st Sept - end 30th Nov)
- Investigating further developments – automation and scenario testing
- Create national tools – (Better, Bigger, Joined) with input from South East pilot areas
- Input to spatial prioritisation projects – Nature Improvement Areas, Green Infrastructure etc
- Testing within Holdings Assessment Toolkit for land management
- Supporting documents and launch of national tools

Any questions?

- Any questions on the approach?
- How would you use the data? Any particular projects you could use this for?
- What other data do you think would be best used alongside this data?
- Any other thoughts?



Thank you

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