

Humberhead Levels Nature Improvement Area

Connectivity: From Sites to Landscape & Partnership

The Humberhead Levels Partnership has worked to embed connectivity ambitions across the Nature Improvement Area programme. This has involved joining up the work of our key visitor infrastructure and partners, working with University of York to analyse ecological connectivity, and developing our evidence base to inform future decision making across the partnership.

Connecting Gateway Sites

A key ambition of the NIA was to establish a network across the Gateway Sites—key partner infrastructure and the starting point for people to explore the Humberhead Levels (Fig 1). The Connect project has coordinated interpretation, marketing material, volunteering and events across a network of 10 sites. Connecting partners in this way has allowed the public to connect with the landscape in a bigger and better way. There is a geocache network to encourage people to get involved, and we have generated over 280 events, engaging over 13000 people and generated over 43,000 volunteer hrs!



Figure 1: NIA Gateway Sites.

Connectivity Indicator

We have been working with York University to develop our metric to measure the NIAs impact on connectivity. This will examine three scales of impact: local to 5km, landscape units, and the NIA or NCA level. It will also explore the relative impact of both the NIA project delivery and Agri-environment Schemes. It will also explore edge ratio and fragmentation.

The basic principle of the patch-wise functional connectivity metric applied here are taken from Moilanen and Nieminen (2002) and for this study can be written as:

$$s_i = \sum_{j \neq i} \exp(-\alpha d_{ij}) A_j C_j$$

where d_{ij} is the distance between habitat patches (polygons in landscape) i and j , A_j is the area of patch j and C_j is the condition score for the area. The parameter α controls how the contribution of patch j to patch i 's connectivity decays with distance. This measure of connectivity, s , comes from applications of the incident function model approach in meta-population modelling studies, where $1/\alpha$ is typically the average migration distance of a species (Hanski, 1994). This parameter allows for the species-specific effects of dispersal limitations on the rate of inter-patch movement to be explicitly considered.

www.ywt.org.uk/Humberhead-levels-NIA

Condition and Connections

As well as thinking about structural and functional connectivity, the NIA Monitoring and Evaluation Group wanted to make sure that the NIA considered the quality of sites as well as spatial and wider landscape considerations. As part of working on our Evidence Base, we have developed a first version of our Condition Map, which linking in with our Habitat Map and survey update to increased the validity of our data (Fig 2 a and b).

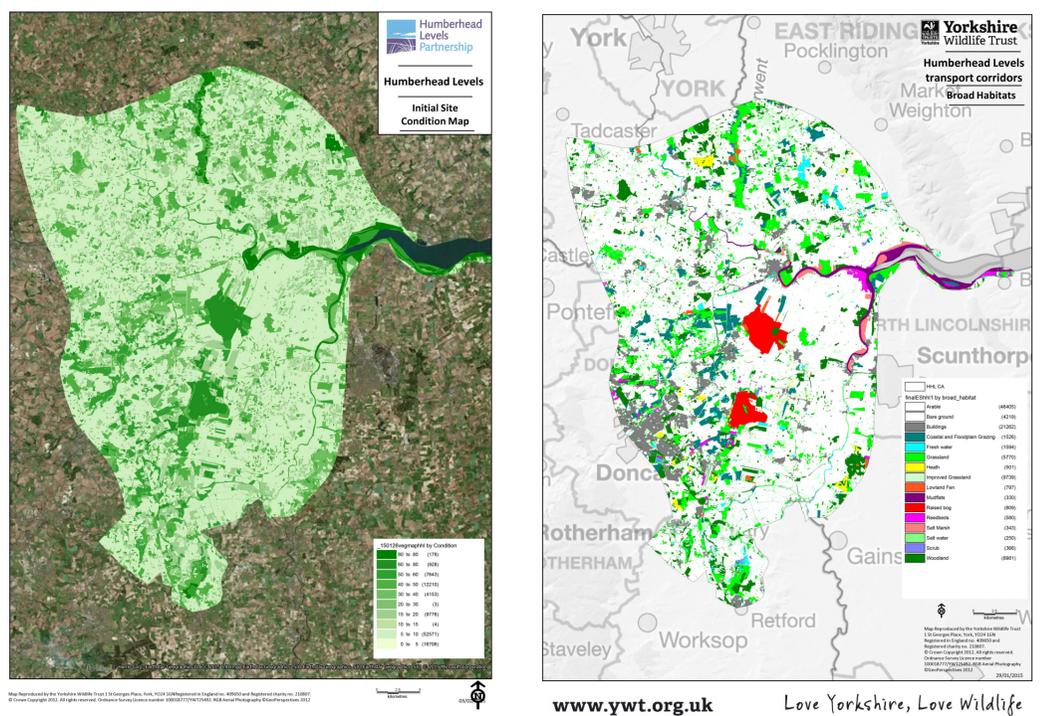


Figure 2: A) Version 1 Condition Map for the Humberhead Levels (condition surveys such as Common Standards, Structures Surveillance, LWS). B) Version 1 Habitat Map based on local Phase 1, LCM 2007, Forest Inventory, PHI, and other local habitat survey.

Connecting to future plans

The Humberhead Levels Partnership is currently working across our core sites to connect their management plans at a landscape scale, and explore prioritisation for restoration. Part of this is exploring the outputs and support that can be generated from models such as ECO SERVE GIS and CONDATIS, and also exploring how we can better monitor progress at achieving our ambition landscape level outcomes. Connectivity at the landscape level is a key indicator to monitor our progress, especially complemented with more site based condition monitoring.

In building our measures of success we are exploring the use of a modified conceptual model from ecological restoration, after Hobbs and Harris (2001) which can be seen in Fig 3. In this model indicators are developed to represent ecosystem states in a restoration trajectory, where condition is around Stage 5 and landscape connectivity at Stage 6. The application of this works at a number of levels and be used in business planning and reporting.

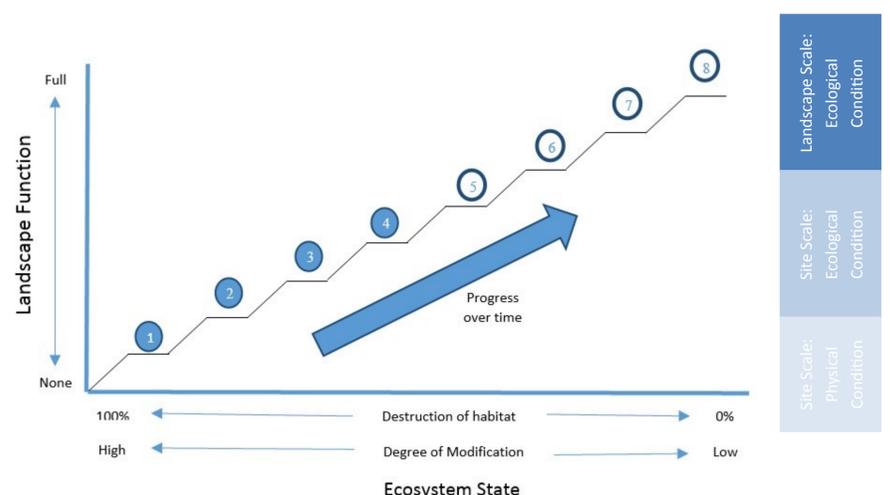


Figure 3: Conceptual Restoration Trajectory modified from Hobbs and Harris (2001). It is intended to highlight the level of landscape modification and also an increased reliance on outcomes moving away from the site (number 1 through 5) towards landscape scale indicators (6 through 8).