Suffolk Ecological Networks Project Mapping Methodology

Background

Suffolk Wildlife Trust (SWT) and Suffolk Biological Records Centre (SBRC) on behalf of the Suffolk Biodiversity Partnership will deliver the Suffolk Ecological Networks project. It has two goals, which support the delivery of the Suffolk Biodiversity Action Plan (BAP):

- To counter habitat fragmentation and climate change by mapping wildlife habitat across the county and establishing ecological networks of interconnected habitat on which to focus conservation effort.

- To encourage targeted action for BAP habitats and species within the ecological networks by providing proactive advice to landowners and community groups.

Developing ecological networks in Suffolk will focus efforts to enlarge and link together existing wildlife habitats to create an interconnected landscape through which species can move freely. In doing this, the delivery of the project will move Suffolk a step closer towards the overall aim of the England Biodiversity Strategy (EBS) of 'a halting, and if possible a reversal, of declines in priority habitats and species, with wild species and habitats as part of healthy, functioning ecosystems'.

These networks will be built up from core areas of high wildlife sites, buffer areas and habitat creation areas, particularly farmland habitats, to link up disparate blocks of habitat. As recommended in English Nature's best practice guidance, the mapping methodology will be agreed through a rigorous consultation with all key users, including local authorities and the five habitat working groups. Local authorities will be key users of the Ecological Networks map and the consultation and training seminars to engage Planning Officers and put biodiversity at the centre of local policy and planning, are integral to the network approach.

By drawing together the scattered datasets, held by key users, the Ecological Networks mapping will enhance the delivery of Suffolk BAP targets for grassland, heathland and farmland habitats and species by:

- Identifying priority areas e.g. great crested newt pond, corn bunting site, and dormouse hedge.

- Targeting work to stabilise core populations.

- Focussing habitat work to enable expansion from these core sites.

The project's team of Conservation Advisors will translate the map into on-the-ground action through proactive advisory work with landowners and community groups and a programme of training courses to equip people with the knowledge and skills to monitor and manage BAP species and habitats. SWT has piloted this model of targeted advice coupled with specialised training sessions for several BAP species and habitats, and it has proven an effective way of working. The Ecological Networks project will extend this principle countywide and provide the direction for the longer-term goal of range expansion from core sites through networks of connected habitat across the county.

Since habitats and species do not recognise county boundaries, the project will also seek to establish partnerships with mapping initiatives in neighbouring counties and across the eastern region. By sharing experiences and comparing methodologies during the planning stage of the Suffolk map, we aim to ensure continuity across boundaries and between scales of mapping.

Introduction

The mapping section of the Suffolk Ecological Networks project is divided into two separate aspects. The first of these is the production of an indicative map of biodiversity for the county as a whole. This will provide a simple, pictorial representation of the location and extent of wildlife in the county and opportunities for its expansion. It will represent core areas for wildlife habitats and the appropriate type of biodiversity enhancement for all other areas. The second aspect of the mapping seeks to identify core areas for particular species and habitats and develop ecological networks that will allow expansion and transfer from these areas. Both of these mapping approaches will utilise a Geographical Information System (GIS) to perform the mapping and calculations.

The methodology for the indicative map of Suffolk is based on that developed for the East of England Biodiversity Mapping Project (Land Use Consultants & Terra Consult, 2005). See figure 1. This was prepared for the East of England Biodiversity Forum to meet the need for an informed response to the environmental chapter of the Regional Planning Guidance (RPG 14) in development for the East of England at that time. High levels of growth are outlined in RPG 14 and as such there is a need to establish a network of biodiversity areas and networks to conserve existing biodiversity and where possible enhance it, especially in deficient areas. The preparation of the map complements the regional biodiversity targets as it identifies opportunities for different scales of habitat enhancement.

The map produced includes four components:

- Core Biodiversity Areas
- Biodiversity Enhancement Areas
- Strategic river corridors
- Urban Biodiversity Deprivation Areas

The methodology devised for identifying these areas was also developed to be applicable at a more local level. This was to be relevant to Local Authorities who will need to prepare biodiversity or ecological network maps for inclusion within Local Development Frameworks (LDF). The assumption being that the methodology will be applied using smaller study units enabling a finer resolution output.

Applying the methodology to Suffolk

The report of the East of England Biodiversity Mapping Project (Land Use Consultants & Terra Consult, 2005) outlines the methodology used in detail. This report will not repeat it, but the following is an explanation of the relevant sections and how these have been applied on a finer county scale in Suffolk.

The mapping methodology requires a geographical base unit on which to base the calculations of core habitat and biodiversity enhancement type. The regional study utilised Landscape Description Units (LDU) at Level 1 (Regional) for the Suffolk Ecological Network map Level 2 LDUs were used. See figure 2. Suffolk has 310 of these level 2 LDUS. LDUs are relatively homogenous units of land that are distinct from each other, the boundaries of which are defined on the basis of the analysis of a range of attributes derived from published map-based data. The attributes fall into two category types: Natural (landform geology, geology and soils) and Cultural (settlement farm type, farm type and tree cover). LDUs are a unit widely recognised and used within environmental and landscape based work and so provide possibility of combination of data between different projects and

disciplines, particularly Landscape Character Assessment work and Agri-Environment schemes.

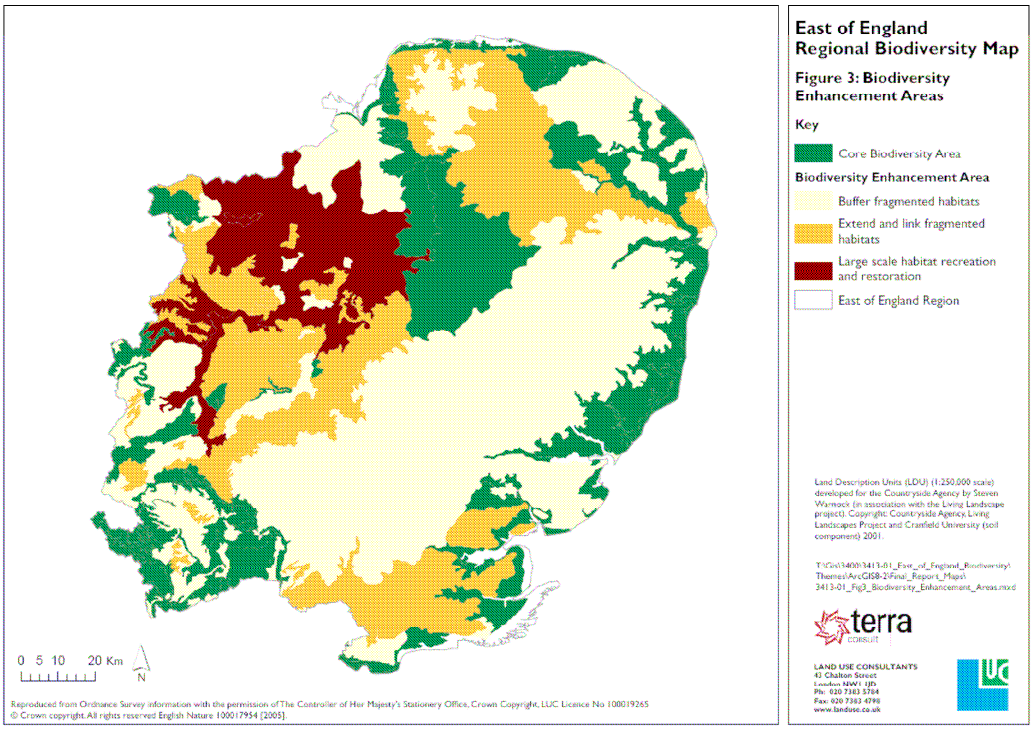

Figure 1. Regional Biodiversity Enhancement Areas

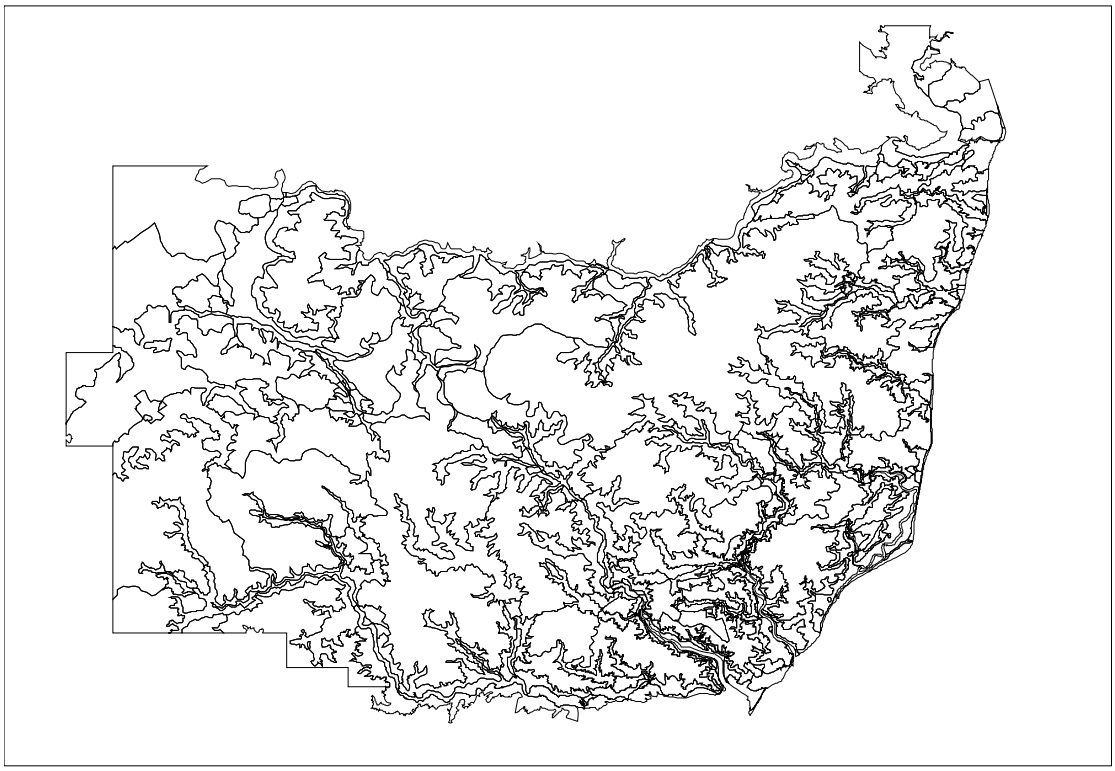

Figure 2. Map showing Suffolk Landscape Description Units

The regional study determined that all land should be classified as either a biodiversity core area or a biodiversity enhancement area. This was important to prevent any blank areas on the map that could be misunderstood within the planning context. It was deemed important that it should be clear that all land has the potential as some form of habitat even if of poor quality.

Biodiversity Core Areas

These are LDUs that have been identified as meeting at least one of the following criteria:

- Over 10% of the LDU area is covered by priority habitat
- Over 10% of the LDU area is covered by a statutory designation for nature conservation-related purposes, i.e. Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Ramsar, National Nature Reserve (NNR) or Local Nature Reserve (LNR)
- Over 10% of the LDU is designated County Wildlife Status

This process identifies 122 LDUs as being Biodiversity Core Areas the resulting map is shown in Figure 3.

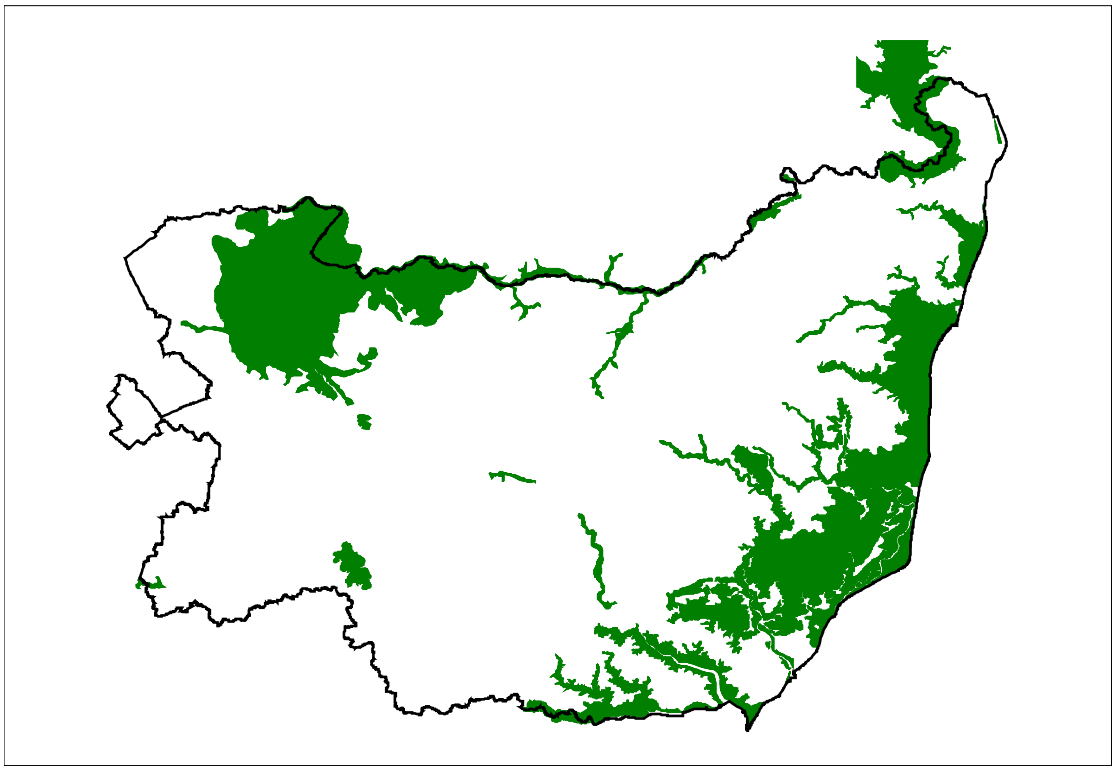

Figure 3. Biodiversity Core Areas

Priority habitat in this case is taken to mean any habitat that is identified in the Suffolk Biodiversity Action Plan. These are: Maritime cliff and slope, mudflat, saline lagoons, Saltmarsh, coastal sand dune, coastal vegetated shingle, cereal field margins, ancient species-rich hedgerows, lowland heath, coastal/floodplain grazing marsh, reedbed, fen and mixed deciduous lowland woodland. The presence of a priority habitat was determined using available GIS datasets. In many cases SBRC has produced up to date and accurately mapped habitat data and these were used where possible. Unfortunately not all BAP habitats have existing extents and these were obviously not included in the calculations. Cereal field margins and ancient species rich hedgerows fall into this category. This is problematic in a largely agricultural county such as Suffolk and needs to be rectified to

enable a truly accurate indicative or network map to be developed. Several of the other datasets are incomplete or of poor quality particularly in the case of English Nature Inventories. These have been used where there was no other data available with the aim to replace them with more accurate and up to date data in future. It is felt that although the data may not produce a truly accurate picture of biodiversity in the county, what data is available allows an adequate representation. The methodology that has been developed will allow the map to be rapidly remade as new datasets become available, allowing it to increase in accuracy over time.

Biodiversity Enhancement Areas

These are the LDUs not identified as Biodiversity Core Areas and area split into three categories by the regional study. The Suffolk methodology uses the same categories however the calculation method varies slightly as outlined below. The three types of enhancement are:

- Large-scale habitat recreation or restoration (Brown)
- Extend and link habitats (Orange)
- Buffer fragmented habitats (Yellow)

All three of these categories are important within the ecological landscape of Suffolk but each provides a different opportunity for biodiversity gains.

In order to define the enhancement type of an LDU it was examined according to the following factors:

- Proportion of priority habitat
- The rural proportion of the LDU as an indicator of wildlife potential
- Habitat patch size
- Fragmentation of habitat patches

The method of calculating these factors follows the regional methodology however the following adaptation was made to fit to the county scale. When assessing the proportion of priority habitat the regional study scored lowland calcareous grassland with a 110% weighting as it was deemed to be incredibly important at the regional level. This habitat is not included in the Suffolk BAP and is thus excluded from the calculations.

When using the factors to divide the LDUs into the three enhancement categories a number of problems were encountered that necessitated further adaptations of the methodology. The regional study states that yellow enhancement areas are those with the least proportion of rural area, the greatest degree of fragmentation as indicated by low average patch size and high fragmentation of patches and the lowest proportion of priority habitat. Orange enhancement areas as middle ranking in all criteria, and brown as being those with the highest proportion of rural area, existing priority habitat and the least degree of fragmentation. When examining the scores for each LDU it became apparent that there were many that didn't fit neatly into this three tier categorisation. Some score low in one section and high in others making it difficult to fit into such a simplified system. As a result the methodology was developed further to allow these awkward LDUs to be classified. Once the original scoring system was applied the remaining LDUs were examined. Those that had an urban area of greater than 66% of the total area were designated to be yellow. The remaining LDUs were then examined based on the fragmentation of habitat and the average patch size for each LDU. The LDUs were split into three tiers for each with a score of one, two or three awarded with 1 being equivalent to the most fragmented third, 2 the middle third and 3 for the least. The same was applied to the average patch size with 1 to the

smallest average and 3 to the largest. These scores were then combined for each LDU with overall total scores of 1-2 being assigned as yellow LDUs, 3-4 Orange and 5-6 Brown.

With all LDUs thus assigned a biodiversity enhancement type the final map was produced. See Figure 4.

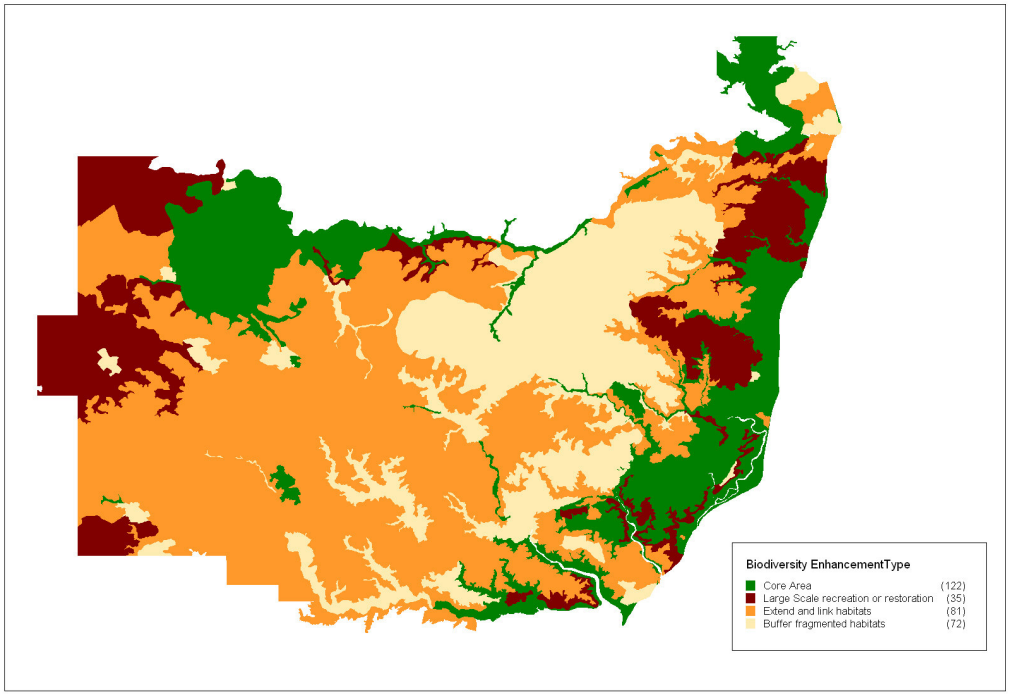

Figure 4. Final Suffolk Biodiversity Enhancement Map