

**HIGHWAYS HABITAT CONNECTIVITY IN DEVON & CORNWALL  
A30 AND A38 IN DEVON AND CORNWALL  
KIER HIGHWAYS & HIGHWAYS ENGLAND**

**BIG Biodiversity Challenge Award Category: Medium - Large  
Project overview**

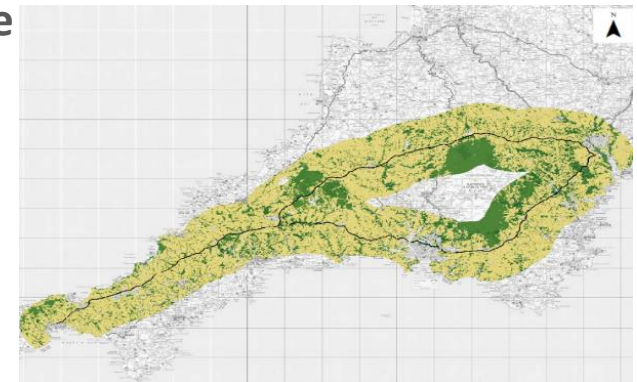
A landscape scale habitat connectivity project (2015-16), in partnership with CEH, was undertaken using remote sensing & earth observation techniques. Results were cross mapped with species data. GIS layers were created to allow easy interrogation. This is a first for the strategic highway network. The main aim of the project was to maximise habitat connectivity and has resulted in several habitat creation schemes, including the creation of new species rich grassland, heathland and 7km of new hedgerow (2018).

**What were the biodiversity conditions on site, prior to the enhancement?**

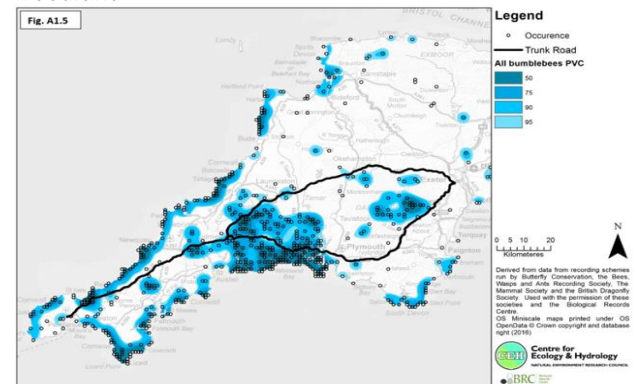
There were some good areas of standalone habitat with potential for high biodiversity value along the highway verge, such as large areas of woodland and hedgerows, grass & heathland, even wetland. However, many of these were suffering from fragmentation with isolated populations of protected species. These highway habitats did not always connect with the wider landscape. We have been recording road casualty data and it was clear that species struggle to travel across and along the road network. The aim of the study and resulting habitat creation schemes was to maximise the free movement of species across the landscape.

**What were the reasons behind this project ?**

Traditionally road networks are viewed as barriers to species movement. However, it has potential to act as a wildlife corridor, if habitats are connected on a landscape scale. As climate change takes hold many species will need to migrate north to reach cooler temperatures. To assess highway verge connectivity on a landscape scale, an innovative approach was required using remote sensing & earth observation techniques, cross mapped with species data. The driver is ultimately biodiversity net gain, to mitigate negative impacts of road networks. This work contributes to Highways England KPI on Biodiversity net gain & Devon and Cornwall BAPs.



*Woodland Connectivity Map: Dark Green shows well connected woodland*



*Mapped species data (bumblebees): cross referenced with heathland GIS layers to identify locations for improvement*

### What were the biodiversity measures taken?

This innovative project covered the trunk road network and the surrounding landscape 20km corridor (10km either side). The objectives were: 1) Categorise and map habitat areas using remote sensing (satellite & LiDAR aerial photography); 2) Establish habitat permeability using ecological research & GIS techniques; 3) Prioritise areas for targeted habitat creation and develop schemes to improve connectivity.

The data used exists for the whole country and could be replicated at a relatively low cost in comparison to major developments. Using the data & mapping from the study we prioritised specific locations and created targeted habitat and species enhancements allowing for better long term management taking a more holistic approach at a landscape scale.

February 2018: a vast hedgerow connectivity scheme was delivered. 21 sites along the A30 and A38 were identified using the mapped data from the connectivity study and involved planting 10,000 native trees and shrubs to fill or reduce gaps in hedgerow and woodland along the roadside. In total the planting has provided around 5km of new hedgerow and connected over 105 miles of habitat on the verges and lands adjacent to the two roads.

Spring 2018: a heathland creation scheme was delivered. The mapped data enabled us to target locations to help connect existing heathland on important sites such as Dartmoor, Bodmin and Goss Moor on the network. Eight locations were delivered creating 26,850m<sup>2</sup> of new heathland, this represents a 60% increase of heathland habitat along the verge. Heathland arisings from neighbouring sites were used as a seed source to ensure local provenance.

June 2018: the creation of new species rich grassland (59,000 M<sup>2</sup>) on the A38 is being delivered to help Highways England meet its commitment to deliver 3500 hectares of new species rich grassland by 2021. The new species rich grassland will be created using our own seed source & provide stepping stone habitat for pollinating species helping to link several SSSIs. Again these locations were identified using the mapped connectivity data.

All of these schemes had pre-works baseline surveys undertaken (i.e. invertebrate surveys). All have monitoring regimes in place, post works surveys are already programmed & will result in biodiversity net gain.



*Hedgerow Connectivity Scheme: 5km of new planting*



*Heathland Connectivity Scheme: plot prepared ready for heathland seed harvested from local sources*

### Further information

BAP species were given priority when mapping the species occurrence data. A priority list of 94 species was then prepared and used to search Biological Records Centre (BRC) and National Recording Schemes and Societies (NSS) databases for all records. This work will inform the long term management of the network in several ways:

- 1) amending maintenance regimes and identifying the most probable location of good quality habitats and where restoration would bring maximum benefit.
- 2) Where new roads and road improvements are to take place the maps and dataset will help planners when evaluating the best places to provide mitigation.
- 3) highlight potential conflict with areas of high biodiversity and land uses under development proposals.
- 4) allow the user to gain a wider appreciation of the landscape scale habitat fragmentation issues without the need to have to visit site.

We were able to produce a Digital Canopy Height Model using LiDAR. This makes the identification of gaps in woodland connectivity extremely easy. Further schemes are currently in design, such as a wetland creation scheme and a green bridge over the A38 in Devon to reconnect a wooded ridgeline and SSSI.

### Project Team

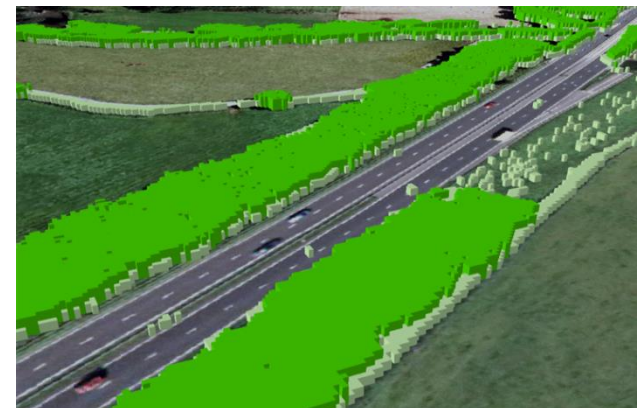
- Highways England
- Kier Highways
- Centre for Ecology & Hydrology

### What was the motivation for carrying out the enhancement?

The transport corridors that transect the country are a necessity for our society and economy to function. They pose one of the biggest barriers to wildlife movement and exacerbate the issue of habitat fragmentation, this issue will only worsen in the face of climate change. However, they also have a huge potential to become corridors for wildlife as well as people. I believe this can only be tackled at a landscape scale and even though projects such as this are above and beyond what is required to manage a road network, they are required to plan and deliver meaningful, effective solutions and enhancements.



*Species rich grassland connectivity scheme: existing plot used as a donor site.*



Digital Canopy Height Model: helped identify gaps in connectivity