



## **CENTRE FOR EVIDENCE-BASED CONSERVATION**

### **SYSTEMATIC REVIEW No. 8: DO HABITAT CORRIDORS INCREASE POPULATION VIABILITY?**

#### **PART A: DO HEDGEROW CORRIDORS INCREASE THE POPULATION VIABILITY OF WOODLAND SPECIES?**

#### **SUMMARY OF REPORT**

**LEAD REVIEWER:** Dr. Zoe G. Davies

**POSTAL ADDRESS:** Centre for Evidence-Based Conservation  
School of Biosciences  
University of Birmingham  
Edgbaston  
Birmingham  
B15 2TT  
UK

**EMAIL ADDRESS:** [z.g.davies@bham.ac.uk](mailto:z.g.davies@bham.ac.uk)

**TELEPHONE:** +44 (0)121 4144090

**FACSIMILE:** +44 (0)121 4145925

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## SYSTEMATIC REVIEW SUMMARY

### Background

To mitigate the effects of habitat fragmentation in the modern landscape, conservation biologists commonly advocate interventions that increase habitat connectivity in order to sustain, and enhance, the population viability of target species. The use of habitat corridors as a conservation tool to mediate such effects has been an area of considerable debate over the past two decades. To investigate whether habitat corridors represent effective conservation interventions, this initial systematic review has focused on whether hedgerow corridors mitigate woodland habitat fragmentation.

### Primary Objective

To systematically collate and synthesise published and unpublished evidence in order to address the following two questions:

1. “Do hedgerows increase the population viability of target species occupying otherwise isolated fragments of woodland habitat?”
2. “Do hedgerows increase biodiversity within otherwise isolated fragments of woodland habitat?”

### Search Strategy

Relevant studies were identified through computerised searches of the following electronic databases: ISI Web of Knowledge (including ISI Web of Science and ISI Proceedings), JSTOR, Science Direct, Directory of Open Access Journals (DOAJ), Copac, Scirus, Scopus, Index to Theses Online, Digital Dissertations Online, Agricola, English Nature’s “WildLink” and the Countryside Council for Wales (CCW) library. Web searches were conducted using the internet meta-search engines Alltheweb and Google Scholar, in addition to inspecting the following statutory and non-governmental organisation websites: UK Department for Environment, Farming and Rural Affairs (Defra), Northern Ireland Department of Agriculture and Rural Development (DARD), European Union portal (Europa), Scottish Natural Heritage (SNH), The Royal Society for the Protection of Birds (RSPB), Birdlife International, Plantlife International, The Mammal Society and The National Trust. Bibliographies of traditional literature reviews and articles accepted into the systematic review at the full text stage were examined for studies that had not yet been identified by any other means.

### Study Selection Criteria

The criteria, which studies had to meet for inclusion into the final stage of the systematic review, were:

1. *Subject*: any mammal, bird, invertebrate, amphibian or plant population or assemblage.
2. *Intervention*: a hedgerow, or hedgerow network, connecting two or more fragments of woodland habitat.
3. *Outcome*: desired primary outcomes were change in population density for a target species or change in species richness within assemblages. Nonetheless, studies were not rejected on the basis of outcome.
4. *Type of study*: any.

## **Data Collection and Data Analysis**

Study inclusion assessments were performed and the observed agreement between the two independent reviewers was deemed to be “substantially good”. Due to a lack of high quality data on changes in the long term persistence of populations or in species richness within assemblages, no formal statistical analysis was undertaken.

## **Main Results**

The evidence currently available on the role of hedgerows as corridors is insufficient to definitively evaluate their effectiveness in regard to maintaining, or increasing, the population viability of species inhabiting woodland. However, although direct, high quality evidence is lacking, there were a number of studies that provided anecdotal evidence supporting the functional importance of corridors, reporting local and mechanistic effects within the system such as species movements. The research suggests that hedgerows with greater vegetational diversity and structural complexity are favourable for movement over hedgerows of a more basic composition.

## **Conclusions**

In the absence of robust, high quality evidence, the management priority should be to improve the quality and continuity of existing hedgerow corridors and to monitor their value with regard to population persistence of target species in the long-term. The behaviour of species moving through hedgerows within agricultural landscape is likely to be influenced by the nature of the matrix, the type and spatial distribution of adjacent habitats, season, farming activities (e.g., herbicide and pesticide applications) and interaction between conspecifics and other species. Detailed information on the movement rates and specific movement behaviour of individuals therefore needs to be collated, if not for each species, then for those of conservation concern. The challenge for researchers is to integrate species’ land-use behaviour and landscape configuration in order to determine whether hedgerow corridors can, or do, function between isolated fragments of woodland habitat.