



## ***CEE review 05-010***

# ***WHAT IS THE IMPACT OF PUBLIC ACCESS ON THE BREEDING SUCCESS OF GROUND-NESTING BIRDS?***

## ***Systematic Review Protocol***

**SHOWLER, D.A., STEWART, G.B., SUTHERLAND, W.J. & PULLIN, A.S.**

Centre for Ecology, Evolution & Conservation - School of Biological Sciences - University of East Anglia - Norwich - NR4 7TJ - UK

Correspondence: [d.showler@uea.ac.uk](mailto:d.showler@uea.ac.uk)  
Telephone:

*Final protocol published on website: 5 December 2005*

*Cite as:* Showler, D.A., Stewart, G.B., Sutherland, W.J. & Pullin, A.S. 2005. What is the impact of public access on the breeding success of ground-nesting birds? CEE protocol 05-010 (SR16). Collaboration for Environmental Evidence: [www.environmentalevidence.org/SR16.html](http://www.environmentalevidence.org/SR16.html).



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

### **SYSTEMATIC REVIEW NO. 16**

#### **WORKING TITLE: WHAT IS THE IMPACT OF PUBLIC ACCESS ON GROUND-NESTING BIRDS?**

**Lead Reviewer:** **Dave Showler**  
**Postal Address:** **Centre for Ecology, Evolution and Conservation,  
School of Biological Sciences,  
University of East Anglia,  
Norwich,  
NR4 7TJ.**  
**Email Address:** **d.showler@uea.ac.uk**  
**Facsimile:** **+44 (0)1603 592250**

### **REVIEW PROTOCOL**

#### **1. BACKGROUND**

The Countryside and Rights of Way Act 2000 (CRoW) has created a new statutory right of access to open country and registered common land in England and Wales, extending the public's ability to enjoy the countryside by opening up previously inaccessible areas (HMSO 2000). However, public access may have potentially deleterious impacts on habitats and species of nature conservation value, including ground-nesting birds (e.g. Bayfield *et al.* 1988, Holland *et al.* 1982, Ratcliffe 1990, Sidaway 1990, Watson 1985, Woodfield & Langston 2004, Yalden & Yalden 1989, 1990). Within the CRoW act, there is provision for the relevant authority (Countryside Council for Wales – Wales, English Nature – England) to exclude or restrict access for the purpose of conserving flora, fauna or geological or physiographical features of the land in question (HMSO 2000). The impact of human access on ground-nesting birds (including cliff-nesting species) needs to be ascertained to enable evidence-based decision-making regarding the restriction of access for nature conservation purposes.

Access on foot is undertaken for a wide range of recreational activities including angling, bird-watching, fell-running, orienteering, picnicking, climbing and walking. Horse-riding and mountain-biking are allied activities. These activities may impact different habitats and biota in different ways. Documented detrimental impacts of disturbance of breeding bird species include golden plover (Yalden & Yalden 1989, 1990), oystercatcher, ringed plover, dipper and grey wagtail (Ratcliffe 1990). Poor breeding success of black-throated and red-throated divers has been attributed to angling disturbance, whilst local declines of common sandpiper have also been noted (Holland *et al.* 1982). More recently studies of ringed plover (Liley 1999), stone curlew (Green *et al.* 2000) and woodlark (Mallord 2005) have revealed impacts at the population level.

The impact of public access on ground-nesting birds may be modified by a number of variables including, the species, the type, intensity, duration and season of access, spatial scale and follow up period (i.e. duration of monitoring). These factors require investigation and will be reviewed in relation to access relevant to the CRoW, as well as looking at the effects of other recreational activities such as angling and climbing.

A systematic review methodology will be used to retrieve data pertaining to the impact of access on ground-nesting and cliff-nesting birds. The review will limit bias through the use of a comprehensive literature search, specific inclusion criteria and formal assessment of the quality and reliability of the studies retrieved. Subsequent data synthesis will summarise empirical evidence which will assist in the formulation of appropriate management guidelines and highlight gaps in research. The review should be relevant to a policy audience, particularly in relation to decisions about the application of the access clauses of the CRoW Act. It may also have wider international relevance and be of use to practitioners in relation to the management of high value nature conservation sites with public access.

## **2. OBJECTIVE OF THE REVIEW**

### **2.1 Primary question**

What is the impact of public access on ground-nesting (including cliff-nesting) birds?

**Table 1:** Definition of components of the primary systematic review question.

Subject (Population)	Intervention Primary	Secondary	Outcome Tertiary
Ground-nesting and cliff-nesting bird species	Angling, bird-watching, fell-running, orienteering, picnicking, climbing, walking, mountain-biking, horse-riding, dog-walking.	Change in breeding abundance/density and population effects (increase/decrease in population size)*	Any other outcomes*
	Vs No access or access at a lesser intensity	Local effects (displacement, nest failure) *	

\* Definitions of adverse impacts including ecologically significant magnitudes must be defined prior to data extraction.

## 2.2 Secondary question

What influence does type of access, the intensity, duration and season of the impact, the species impacted, spatial scale and follow up period have on the impact of public access?

## 3. METHODS

### 3.1 Search strategy

The following electronic databases will be searched:

1. ISI Web of Knowledge
2. Science Direct
3. Directory of Open Access Journals (DOAJ)
4. Copac
5. Scirus
6. Scopus
7. Index to Theses Online (1970-present)
8. Digital Dissertations Online
9. Agricola
10. Europa
11. English Nature's "Wildlink"
12. JSTOR
13. BIOSIS via EDINA
14. SIGLE via ARC2WebSPIRS

The following English language search terms will be used:

1. access\*

2. trampling\*
3. recreation\*
4. walk\*
5. disturbance\*
6. bird (in combination with above)
7. human and disturbance
8. human and activity

Further terms may be added as the search progresses involving combination of the existing terms, further intervention-based terms and the use of taxa-specific terms if necessary. The use of foreign language searches is not anticipated.

Publication searches will be undertaken on conservation and statutory organisation websites (Agricultural Development and Advisory Service, Countryside Council for Wales, Department of Agriculture and Rural Development, Department of Environment, Food and Rural Affairs, English Nature, Joint Nature Conservation Committee, National Trust, Royal Society for the Protection of Birds, Scottish Natural Heritage) and using the meta-search engines Dogpile, Alltheweb and Google Scholar. The first 100 word document or PDF hits from each data source will be examined for appropriate data. In addition bibliographies of articles viewed at full text will be searched. Authors, recognised experts and practitioners will also be contacted for further recommendations and for provision of any unpublished material or missing data that may be relevant. Questionnaires will be circulated to practitioners in order to collate experience.

### 3.2 Study inclusion criteria

- **Relevant subjects:** Ground-nesting (including cliff-nesting) birds.
- **Type of Intervention:** Angling, bird-watching, fell-running, orienteering, picnicking, climbing, walking, mountain-biking, horse-riding, dog-walking. versus no access or access at a lesser intensity.
- **Types of Outcome:** The primary outcome is change in abundance/density of bird species, and population effects. Secondary outcomes concern local effects (e.g. displacement, nest failure). However, studies will not be rejected on the basis of outcome and outcomes other than these will be catalogued.
- **Types of Study:** Type of study will not be used to define inclusion or exclusion criteria. It is envisaged that all information regarding the primary outcome will be collated qualitatively or within a Bayesian framework. Appropriate spatial or temporal controls are a prerequisite for studies to be included in inferential meta-analysis.

Where there is insufficient information to make a decision regarding study inclusion when viewing titles or titles and abstracts, then relevance to the next stage of the review process will be assumed. Reviewers will consider articles viewed at full text for relevance excluding or admitting them to different categories of relevance and quality. At least two reviewers will independently assess a random subset of 25% of articles viewed at full text. Disagreement will be resolved by consensus, or following assessment by a third reviewer.

### 3.3 Study quality assessment

Reviewers will consider articles viewed at full text excluding or admitting them to different categories of information quality. At least two reviewers will independently assess a random subset of 25% of articles viewed at full text. Disagreement will be resolved by consensus, or following assessment by a third reviewer.

### 3.4 Data extraction strategy

Data regarding study characteristics, quality and results will be recorded on a specially designed data extraction form. These forms may be amended after consultation with statisticians and piloting of the data extraction process.

### **3.5 Data synthesis**

It is envisaged that all information will be collated qualitatively or within a Bayesian framework. This will incorporate meta-analysis where appropriate data exists. Reasons for heterogeneity in results including type of access, the intensity, duration and season of the impact, the species or habitat impacted, spatial scale and follow up period will be investigated by meta-regression where appropriate data exist.

### **3.6 Reasons for heterogeneity**

The following potential reasons for heterogeneity have been formally identified a priori in order of importance.

1. Type of access
2. Intensity of access
3. Duration of access
4. Season
5. Species impacted
6. Follow up period
7. Spatial scale

## **4. POTENTIAL CONFLICTS OF INTEREST AND SOURCES OF SUPPORT**

No conflicts of interest to be declared. This systematic review is funded by NERC.

## **5. SUBSTANTIVE AMENDMENT**

The original protocol developed in association with the RSPB was broader, including changes in vegetation composition and mammal abundance amongst the outcomes. Searching for all outcomes simultaneously increases cost-effectiveness but the additional complexity and time required to deal with multiple outcomes was judged excessive. The RSPB were therefore consulted and prioritised ground-nesting and cliff-nesting birds, leading to substantive amendment of the protocol.

## **6. REFERENCES**

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## **7. APPENDIX**

The Royal Society for the Protection of Birds provided the following contacts, stakeholders and experts. We intend to invite these people and organisations to comment on the protocol and attend a stakeholder meeting to verify and refine the protocol prior to undertaking the search for information.

Contacts: Gwyn Williams, David Gibbons, Rowena Langston, John Day

Stakeholders: CA/EN/CCW Wildlife and Access Advisory Group chaired by Graham Bathe of EN.

Experts (researchers): Rowena Langston (RSPB), John Day (RSPB), Dur wyn Liley (Footprint Ecology), Jenny Gill (UEA).