BM Protocol

Moorland breeding birds

Aim

To record the annual distribution and abundance of breeding birds within selected areas of ECN sites

Method

Research on moorland bird populations indicates that the number of breeding pairs can be assessed with confidence for the waders, but that, among the passerines, twite (*Acanthis flavirostris*), skylark (*Alauda arvensis*) and meadow pipit (*Anthus pratensis*) present some difficulties. Most of the changes in breeding numbers of moorland birds seem to stem from differences in habitat conditions, weather conditions and food availability, though much debate persists about the additional or compounding effects of predation, parasitism and disease. The methodology described below provides a well-tested means of assessing numbers of breeding birds on moorland.

Licences to disturb breeding birds listed under Schedule 1 of the Wildlife and Countryside Act (1981) should be obtained from English Nature, Scottish Natural Heritage, Countryside Council for Wales or the Department of Agriculture for Northern Ireland.

Location

The survey is based on a representative group of 1 km^2 units of the National Grid. The area to be surveyed will depend on the size of the ECN site and on the consistent availability of staff to carry out this activity on the same area each year. A survey area of 4 km^2 (2 km x 2 km) may be expected to require at least one man-day's work per visit. On enclosed land this is approximately equivalent to a search intensity of one minute per hectare. Each of the 1 km^2 units to be monitored is divided into four sub-squares, each 0.5 km x 0.5 km, which are marked so as to be re-locatable in future surveys. This eases navigation and ensures that all parts of the kilometre square(s) receive equivalent amounts of search effort.

Sampling

Frequency and timing

Each subsquare is surveyed twice during spring/summer by a single observer. The first visit should take place between early-April and mid-May. The second visit should take place between mid-May and end-June. These times may need to be changed, being earlier if there is an early spring and later if spring is late. The survey should be carried out only between 0830 and 1800 BST, thus avoiding periods when the detection of birds is unreliable. The survey should be carried out when wind strength is less than Beaufort Scale Force 5; there should be good visibility, and no persistent precipitation.

Mapping method

Within each subsquare 20-25 minutes should be spent surveying the entire subsquare thoroughly by walking about it in such a way that all parts of the square are approached to within 100 m. On the second visit, subsquares should be visited in the reverse order to that used on the first visit. The observer should stop at regular intervals, scan and listen. Attention is focused on obtaining proof of breeding (see below) and on distinguishing individual pairs of birds.

Apart from red grouse (*Lagopus lagopus scoticus*), skylark, meadow pipit, twite and carrion crow, the locations and activities of all species should be recorded separately (see Chapter 3, page 173) for each of the two visits on a 1:25 000 or 1:10 000 map using the notations of Marchant (1983); the date and starting time

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for each subsquare should be recorded on the back of the map. Birds are considered to be breeding if any of the following activities are observed:

- song or display;
- birds carrying nesting material;
- nests or young birds found or chicks heard;
- adults repetitively alarmed, indicating nearby nests or young;
- adults giving distraction displays;
- birds carrying food;
- birds in territorial dispute.

All data are transferred from field survey maps to summary visit maps. Where several individuals are present in an area, and it is impossible to determine the number of pairs they represent in the field, individuals are judged to be representative of different pairs only if the distance between them is greater than 500 m (or greater than 200 m for dunlin (*Calidris alpina*) and passerines). In these instances, where two individuals are considered to constitute a 'pair' of birds, the pair's location is placed centrally between the two individuals.

Individual red grouse, skylarks, meadow pipits, twite and carrion crows are counted within each 1 km square only on the first visit.

Population estimates

Maps produced on both visits are considered together in assessing the records for population estimates and in producing distribution maps. For all species other than dunlin and passerines, breeding pairs are considered to be separate from one another only if more than 1 km apart on different visit maps. For dunlin, this distance is reduced to 500 m, and for passerines it is reduced to 200 m. Where pairs are judged to be the same (ie less than these distances apart), their locations are mapped as being half-way between the mapped observations of pairs on the two individual visit maps.

The distribution maps can be related to habitat and topographical information collected for the site.

A full description of the method is provided by Brown and Shepherd (1993).

Authors

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References

Brown, A.F. 1991. *An annotated bibliography of moorland breeding bird and breeding wader surveys, 1970-1990*. (Report no. 8.) Peterborough: Joint Nature Conservation Committee.

Brown, A.F. & Shepherd, K.B. 1993. A method for censusing upland breeding waders. *Bird Study*, **40**, 189-195.

Brown, A.F. & Stillman, R.A. 1993. Bird habitat associations in the eastern Highlands of Scotland. *Journal of Applied Ecology*, **30**, 31-42.

Marchant, J. 1983. *BTO Common Birds Census instructions*. Tring: British Trust for Ornithology.

Thompson, P.S. & Thompson, D.B.A. 1991. Greenshanks (*Tringa nebularia*) and long-term studies of breeding waders. *Ibis*, **133** (Suppl.1), 99-122.

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Specification of results and recording conventions

The measurement variables listed below are those required for each BM sampling location at an ECN Site. Sites submitting data to the ECNCCU should refer to the accompanying Data Transfer documentation for the specification of ECN dataset formats, available on the restricted access Site Managers' extranet. Contact ecnccu@ceh.ac.uk if you need access to this documentation.

The first 4 key parameters uniquely identify a sample or recording occasion in space and time, and must be included within all datasets:

• Site Identification Code (e.g. T05)	Unique code for each ECN Site
• Core Measurement Code (e.g. PC)	Unique code for each ECN 'core measurement'
• Location Code (e.g. 01)	Each ECN Site allocates its own code to replicate sampling locations for each core measurement (e.g. for different surface water collection points)
• Sampling Date (/time)	Date on which sample was collected or data recorded. This will include a time element where sampling is more frequent than daily

ECNCCU 2001

Core measurement: vertebrates – birds (BI Protocol)

Moorland birds (BM)
Moorland birds are monitored twice annually, between early April and mid-May and between mid-May and end June, through complete survey of selected 0.25 km squares. Locations and activities of moorland birds by species are marked on to maps using the standard BTO notations given overleaf, with the exception of five species: red grouse, meadow pipit, skylark, twite and carrion crow - which are simply counted. The following information should be recorded.

Variable	Units	Precision of recording
Map-based recording		
Site Identification Code		
Core Measurement Code		
Location Code		
Recording (Sampling) date		
Visit code	1 (first) or 2 (second)	
Habitat features	BTO CBC method[1]	
Species/nest location	BTO codes[2]	
Bird activity	BTO codes[3]	
Square codes (1 km)	numeric code	
Subsquare codes (0.25 km)	1 character code (A-D)	
Form-based recording		
Site Identification Code		
Core Measurement Code		
Location Code		
Date of recording		
Start time	BST 24-h clock	1 min
Finish time	BST 24-h clock	1 min
Visit code	1 (first) or 2 (second)	
Square code (1 km)	numeric code	
Subsquare code (0.25 km)	1 character code (A-D)	
Numbers of the five species to be counted	count	1

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Recording forms

1. Standard CBC summary sheets and BBS field recording forms are available from the Census Unit, British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU, UK. (Note that the CBC summary sheets are normally completed by the BTO from interpretation of the maps sent in by recorders.) The BTO normally arrange for the preparation of CBC outline maps of the survey area.
2. A field recording form for moorland birds is available from the CCU.

Notes

1. BTO CBC habitat mapping instructions (pp174-176)
2. BTO species codes (p177)
3. BTO bird activity mapping symbols (p178)

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