

Short-eared Owl

Title

Short-eared Owl 2006-2007

Description and Summary of Results

Knowledge of the population size and trends of breeding Short-eared Owls *Asio flammeus* in Britain is poor and, although there is a similarly inadequate knowledge of the status of the species in many other parts of its range, it is generally thought to have undergone population declines and breeding range contraction within recent decades. With the conservation interest in the species, including statutory designations (eg it is listed as vulnerable in Annex 1 of the EU Wild Birds Directive) there is benefit in improving knowledge of its current status and in improving techniques for its reliable monitoring. Effective surveillance requires knowledge of reliable times to detect the species and ideally also to ascertain the breeding status of individuals that are recorded. Owls, as a group, are typically nocturnal and many surveys of them rely on the detection of calling birds or the monitoring of known breeding sites. Short-eared Owls are not particularly vocal and can show low levels of tenacity to some breeding sites. They are, however, noted to be among the more regular diurnally active owls, and therefore surveys could potentially be based on observations of breeding birds.

A survey was set up, with both a professional and a wider-scale component, to try to quantify the diurnal activity patterns of breeding Short-eared Owls at three study areas in Scotland and to look at the practical implications of these for the potential survey and future monitoring of the species.

The proportion of time for which breeding owls were visible during daylight hours was low (4.8% of the time for the season March-July) and there were significant effects of stage of breeding, and of time of day within some stages. There was a greater than 75% likelihood of seeing owls during a combined total of four hours of watching (1) in the evenings during incubation (mid-April to mid-May), (2) mornings and evenings during chick-rearing (June), and (3) early morning and late evening during fledging (July). The likelihood of seeing key territorial behaviours was always low. Therefore, because surveys may only be able reliably to identify pairs that successfully reach the chick-rearing stage, the most robust survey/monitoring unit may be pairs that successfully hatch young.

The mean distance from an observer at which owls were first detected in 2006 was 495m (95% confidence limits 390-601m), and significantly greater in 2007 at 741m (95% 651-832m). This shows that a survey of any defined area will require vantage points separated by a minimum distance of about 1.5km, with allowance for topography, and a 180° field of view. Evidence of a disturbance or deterrence effect of field surveyors on the owls supports the need for unobtrusive observation points.

Seventeen volunteers carried out 174 point counts on 19 transects in 2007. Overall 97 bird species were recorded between mid-April and June in 2006 and 2007. Encounter rates

suggested that the method could produce useful information for breeding population indexing purposes (complementary to that from existing surveys eg BBS) for a range of species including two widespread raptors, and some breeding waders, gamebirds and passerines. The point counts also produced a satisfactory rate of encounter with owls. For transects surveyed in both 2006 and 2007, the number of registrations was slightly greater in 2007 than in 2006 (17 compared to 13), suggesting that there may be some meaningful correlation with the number of territories apparent from the vantage points within the study areas (up to 13 in 2007 compared to up to 11 in 2006 for vantage points monitored in both years). Furthermore, the small number of coincident transects that were surveyed by both professional fieldworkers and by volunteers does suggest a degree of repeatability in the methods.

Methods of Data Capture

Fieldwork was undertaken in three study areas and systematic observations of breeding Short-eared Owls were made from four independent vantage points in Ayrshire, three in Perthshire and three in the Borders. Points were selected based on local knowledge of locations where owls had nested recently. Each vantage point had a relatively unrestricted view of a maximum arc of 180°, was at least 250m distant from actual nest sites and was relatively obscured, eg by shrubs, or located on a slope, attempting to minimize any disturbance. Short-eared Owls bred within the field of view of each vantage point and reached the chick-rearing stage in all cases. Once selected, the vantage points and the search arc from them remained constant during the two study seasons, 2006 and 2007. The vantage points ranged in altitude from 180-480m asl and, combined, the habitat composition was: heath and bog (ca 60%), semi-natural grassland (32%), mature conifer plantation (3%), improved grassland (3%) and young pre-thicket conifer plantation (2%). Systematic observations (two-hour sampling intervals) were made in four study periods in each of the two years: March (territory occupation); mid-April to mid-May (incubation); June (chick-rearing); and July (fledging). A total of 1010 hours of systematic fixed-point watches was completed.

Within, or close to, each of the three study areas, two 'transects' were selected. Each was a series of roads or tracks that crossed potentially suitable habitat. Along each transect, suitable count points (14-21) were identified that offered a relatively unobscured view, where a vehicle could be parked safely, and with a minimum distance of 1km between count points.

Each transect was surveyed once in each of the four stages of the breeding season in 2006, but only in the second and third survey periods in 2007 within the last three hours before dark. Timed point counts (five minutes at each point) were used to measure the abundance of all bird species encountered (seen or heard). Surveyors used vehicles to drive between count points. From each count point, each registration of a bird was assigned to one of five distance bands (0-25m, 25-100m, 100-500m, 500-1000m and 1000+m). Birds seen or heard only in flight were recorded separately, although displaying birds (eg skylark, meadow pipit and curlew) were recorded within the respective distance bands above which they were flying. Care was taken in the field to try to avoid recording individuals more than once,

either at neighbouring count points or anywhere along the transect. Only birds in open habitats were recorded (those in any woodland present were excluded).

To increase the sample size and geographical spread of point counts, and to assess the potential interest by volunteer birdwatchers in participating in such extensive monitoring, a general request was made for volunteers to undertake additional 'transects' of point counts in similar habitats across Britain.

Purpose of Data Capture

The aims of the study were: 1) to identify the most appropriate times of day and stages of breeding for surveying Short-eared Owls; 2) to evaluate the feasibility of extensive field surveys and how these related to numbers of breeding owls estimated from intensive observations in key study areas.

Geographic Coverage

Three areas of Scotland for the intensive professional fieldwork but extending to other upland areas for the volunteer part.

Temporal Coverage

April to July in 2006 and 2007.

Other Interested parties

The project was a joint partnership of the BTO with Scottish Natural Heritage, the Royal Society for the Protection of Birds, the Scottish Raptor Study Groups, the Countryside Council for Wales, and the Joint Nature Conservation Committee.

It was funded by Scottish Natural Heritage, the Countryside Council for Wales (now Natural Resources Wales), the Joint Nature Conservation Committee Support Company, the J & JR Wilson Trust and the AEB Trust as well as the BTO itself.

Organiser(s)

John Calladine

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Publications

The main report on the survey was published as:

Calladine J., Garner G., Wernham C. & Buxton N. 2010. Variation in the diurnal activity of breeding Short-eared Owls *Asio flammeus*: implications for their survey and monitoring. *Bird Study* 57: 89-99.

Two reports evaluating the methods for longer term work are:

Calladine, J.R., Crick, H.Q.P. & Wernham, C.V. 2005. Development of methods for surveying and estimating population size of Short-eared Owls. *BTO Research Report* no. 394.

Calladine, J., Garner, G. & Wernham, C. 2008. Developing methods for the field survey and monitoring of breeding Short-eared Owls (*Asio flammeus*) in the UK: Final report from pilot fieldwork in 2006 and 2007. *BTO Research Report* no. 496.

Available from NBN?

No.

Computer data -- location

BTO Scotland

Computer data -- outline contents

Text files (different files associated with different sources) with associated SAS programmes for merging, management and description.

Computer data -- description of contents

Volunteer sourced data are stored as:

Site, Date, Time, Species, Distance Bands, Weather, Observer Code

Information held in BTO Archives

BTO Scotland

Notes on Access and Use

Other information needed

Notes on Survey Design

Specific Issues for Analysis

