# Nightjar 2004

**Title**
Nightjar 2004.

**Description and Summary of Results**
The Nightjar *Caprimulgus europaeus* is a red-listed species that is protected under Annex 1 of the EC Birds Directive. Numbers and range declined in Britain over most of the 20th Century, but began increasing again since the start of the 21st. The species breeds mainly in southern England, but there are scattered populations as far north as central Scotland. It is the subject of a national Biodiversity Action Plan (BAP).
This (2004) survey was the fourth survey of the species organised by the BTO with various partners, previous ones being in 1957-58, 1981 and 1992.
Observers located 4131 singing ("churring") males in 3264 surveyed 1-km squares (in 603 10-km squares). (In 2005, a further 192 territorial males and 3 unsexed individuals were located in places not covered during the 2004 survey (New Forest, Dorset Heaths and East Anglia). However, up to 7 of these may be represented in both the 2004 and 2005 datasets.)
Not all 1-km squares selected for coverage were actually surveyed, those that were covered were not visited an equal number of times and not all areas of suitable habitat were covered. A correction factor for survey intensity and suitable habitat not visited was therefore applied to adjust the population estimate.
The overall estimated total was 4606 males, an increase of 36% since 1992, and the positive records in 275 10-km squares showed a 2.6% increase in range. However, there was evidence of population decline and range contractions in northwestern Britain, including north Wales, NW England and in Scotland.
In 2004, 57% of Nightjars were associated with forest plantations (similar to 1992) and 59% with heathland (slightly higher than in 1992). National BAP objectives for the conservation of the species were reached in respect of population size and stability, but the target for a 5% range increase by 2003 was not met.

**Methods of Data Capture**
The geographic units for the survey were 1-km squares. All sites known to have been occupied in the previous few years were mapped as were formerly occupied sites where suitable habitat might remain. The strategy was to cover all high priority sites and to sample 100-km buffer zones around these (to detect local range expansion). Further, a random sample of areas of potentially suitable habitat, but with no recent record of occupancy, was also made. Specific sample squares were chosen on a hierarchical basis according to three levels of priority: high -- sites known to have held birds at any time since 1992, and a random sample of 500 1-km squares containing suitable habitat within 100km of such known sites; medium -- a 30% sample of sites occupied in 1981 but not subsequently, and a sample of areas of potential future Special Protection Areas (SPAs) extension or designation; and low -- a 10% sample of sites with suitable habitat but no

history of occupancy, and additional sites which observers considered to contain suitable habitat.
Observers (mainly volunteers but with professional help covering gaps, particularly in remote parts of Wales, parts of Dorset and lowland Scotland) were asked to make two visits to allocated 1-km squares between late May and mid July. Each surveyor recorded the locations of all individuals observed (onto 1:2500 maps) from all visits and casual records. These were plotted in GIS to determine individual territories, whilst accounting for duplicated observations from adjacent recording areas or additional visits. Observers also noted the occurrence of habitat categories within 50m of each Nightjar registration.

**Purpose of Data Capture**
The stated aim was to assess the population size and range of the Nightjar and to gather information on its use of different habitat types.

**Geographic Coverage**
The stated aim was to survey the entire UK breeding population of the species, although the actual coverage did not reach this ideal. The range is concentrated into southern England but there were known to be scattered populations as far north as lowland Scotland. In the event sample 1-km squares in 603 10-km squares around Britain were visited.

**Temporal Coverage**
Most of the data were collected in 2004 but some additional data, to provide complete coverage of selected Special Protection Areas (New Forest, Dorset Heaths, Breckland and Suffolk Sandlings), were collected in 2005 by BTO and Just Ecology for English Nature (now Natural England).
A minimum of two visits to a site, at either dusk or dawn, between late May and mid July was requested, with a stated preference for one to be in June and with at least three weeks between visits.

**Other Interested parties**
The survey was organised, run and funded by BTO in partnership with the Royal Society for the Protection of Birds, Natural England (then English Nature) and the Forestry Commission in England, Wales and Scotland.

**Organiser(s)**
Greg Conway and Ian Henderson as BTO staff members.

**Current Staff Contact**
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**Publications**

A full report of the survey is:

Conway, G., Wotton, S., Henderson, I., Langston, R., Drewitt, A. & Currie, F. 2007. The status and distribution of European Nightjars *Caprimulgus europaeus* in the UK in 2004. *Bird Study* 54: 98-111.

It was noticed in *BTO News* numbers 250 and 259.

**Available from NBN?**

Yes -- as part of the Nightjar dataset covering the 1981, 1992 and 2004 surveys.

(The dataset contains a total of 4197 territory records, comprising 3083 territorial males (10 without location information), six single females, 18 unsexed adults and 46 presumed migrant males – only noted in May.)

**Computer data -- location**

BTO Windows network central area.

**Computer data -- outline contents**

All bird counts, habitat data and counts of "other species" at each site on each visit.

**Computer data -- description of contents**

"2004 Nightjars Survey Visit Data.xls" contains all information relating to visits in 2004: Columns are: 1-km square; Site Name; 10-km square; 1-km square; Central Grid Reference; BTO Region; County; Visit - A B etc; Date - of visit (DD/MM/YYYY); Start - time (xx:xx); Finish - time (xx:xx); Dawn/Dusk; Rain - Y/N; Cloud cover - as percentage; Wind direction; Wind Force; Temperature; Moon Phase; Number of Males (in survey area); Number of females (in survey area); Males on adjacent survey area; Notes

"2004 Nightjar Habitat Data.xls" contains all habitat data recorded on survey forms:

Columns are: sitename; 10km square; 1km square; gridref (6 figure); county (in words); btoreg (4-letter code); region (SEAST, SWEST etc); visit (A B etc); bird (1 - 23 but incl 0 presumed to be where centre not in 1-km square); bird1 (0.1, 0.2, 0.3, 1.0 - presumed proportion of territory in square); habitat columns = 0 or 1 for absence/presence of habitat in the 1-km square: unpl (unplanted); bdlf (broadleaf); con (conifer); mix (mixed); lt1m (less than 1m high); onetotwo (1-2m); twotofour (2-4m); gt4m (more than 4m); stnd (stand); brsh (brash); dry; wet; Pb (??); Bracken; Grass; Heather; bdlf; con; mix; Ride; Edge; activity; SiteSuitable; Notes; Comments

"OtherSpecies.xls" Contains data for all other bird species reported during the 2004 survey.

Woodcock; Tawny Owl; Long-eared Owl; Wood Lark; Song Thrush; Grasshopper Warbler; Little Owl; Cuckoo; Barn Owl; Turtle Dove; Stone Curlew; Muntjac; Hobby; Yellowhammer; Whitethroat; Kestrel; Linnet; Red Deer; Red Fox; Oystercatcher; Snipe; Curlew; Dartford Warbler; Stonechat; Bat sp; Wren; Willow Tit; Lesser Redpoll; Bullfinch; Goshawk; Corn Bunting; Tree Pipit; Willow Warbler; Nightingale; Honey Buzzard; Buzzard; Meadow Pipit; Roe Deer; Robin; Raven; Badger; Mallard; Pheasant; Swan; Short-eared Owl; Red Grouse; Swallow; Grey Partridge; R-L Partrige; Woodpigeon; Crow; Chaffinch; Swift; Brown Hare; Peregrine Falcon; Teal; Skylark; Blackbird; Glow Worm; Lapwing; Redstart; Sparrowhawk; Heron

**Information held in BTO Archives**

2 Archive boxes containing data.

**Notes on Access and Use**

The data were collected under the Statutory Conservation Agencies and RSPB Breeding Birds Scheme (SCARABBS). Please acknowledge BTO, RSPB, Natural England and the Forestry Commission for England, Wales and Scotland in any use of the data.

Users are requested to exercise appropriate care when publicising or publishing any results because the species is vulnerable to human disturbance and habitat loss. Full disclosure of breeding locations to the public might lead to environmental harm.

**Other information needed**

**Notes on Survey Design**

Large expanses of relatively uniform heathland or forests, usually pine plantations, in the lowlands or mixed conifer plantations in the uplands, were identified from a) heathland inventories held by RSPB, English Nature and forest stock maps, b) Geographic Information System (GIS) databases of the Forestry Commission, and c) the National Inventory of Woodland and Trees respectively. The same habitat criteria were used in the present survey as in the previous Nightjar survey (1992) to identify 1-km squares that contained potentially suitable habitat. These criteria included conifer plantations less than 21 years old, plus unplanted blocks, bare ground and clear-fell areas.

'Playback' of Nightjar calls was not used as it could have biased counts if not used ubiquitously, and could have caused disruption by drawing birds in from neighbouring areas.

Observers recorded the presence or absence of several habitat categories occurring within 50m of each Nightjar registration or at the centre of sites where no Nightjars were recorded. This was the same as the method used in 1992, but the heathland category was divided into three subcategories: 'forest', 'heathland' or 'woodland'. The forest and woodland categories were further subdivided according to the composition of the woodland (unplanted, conifer, broadleaved, mixed), four height categories (<1m, 1-2m, 2-4m, >4m), the presence of 'stands' of taller or mature trees within young plantations or 'brash/stumprows' which may be used as song-posts, and the presence of 'rides' or woodland 'edge'. In 'heathland', ground cover was assessed as >50% cover of Bracken *Pteridium aquilinum*, grasses Gramineae or heather species *Erica* spp and *Calluna* spp, and as 'wet 'or 'dry'. The presence of conifer or birch *Betula* spp encroachment onto heathland was also recorded. These categories were not mutually exclusive as, for example, a Nightjar registration might be at the edge of both forest and dry heath.

**Specific Issues for Analysis**

Lone males that were heard "churring" in May only, particularly in coastal counties along the English Channel, and which were not subsequently observed during the breeding season were excluded from the population calculation. These individuals were considered to be passage birds *en route* to breeding grounds further north.

To assess population estimates a boot-strapping, resampling method was used, with 999 reiterations to calculate 95% confidence intervals around mean population estimates, based on the actual counts of territorial males seen or heard. From the real counts, regional (and hence national) extrapolated population estimates were calculated to account for unsurveyed areas of habitat. These calculations accounted for differences in habitat composition (in practice relatively similar and no adjustments were made) and the mean area of habitat availability between surveyed and unsurveyed squares (in practice these were sometimes different). In such circumstances, male densities were recalculated for a subset of the regional data that contained a similar area of available habitat, per $km^2$ (±1 sd). These new density estimates were used on a regional basis, to account for the 1-km squares not surveyed, which was important as male densities varied disproportionately with the area of available habitat per $km^2$. See the published report for more details of this. A similar approach was used on a reanalysis of the data from previous surveys to enable comparisons.