

# Breeding Nightjar Survey – 2011 – Humberhead Peatlands NNR, SAC, SSSI, SPA (Hatfield Moors)

## 1. Introduction

- 1.1 This report presents part of the findings of an annual survey of breeding nightjar *Caprimulgus europaeus* on the Humberhead Peatlands National Nature Reserve (NNR) between 10<sup>th</sup> June and 4<sup>th</sup> July 2011. The aim of the survey was to determine the number of churring male nightjars holding territories on The Thorne, Goole and Crowle Moors and Hatfield Moors. This report details the survey results from Hatfield Moors only and Thorne, Goole and Crowle Moors are covered in a separate report.
- 1.2 Whilst conducting the survey other species of interest were also recorded, in particular, long-eared (*Asio otus*), tawny owl (*Strix aluco*), grasshopper warbler (*Locustella naevia*) and woodcock (*Scolopax rusticola*).

## 2. Methodology

- 2.1 Two visits were made to Hatfield Moors on the 18<sup>th</sup> and 25<sup>th</sup> June, with a third part visit to the north-east section on the 4<sup>th</sup> July.
- 2.2 The survey method applied followed the standard design of Cadbury (1981), as summarised in Gilbert et al. (1998), with modifications by Conway et al (2007) for a breeding season survey to establish population size.
- 2.3 Surveying began each night at 22.00 hrs (BST) and ended not later than 2.30 hrs (BST).
- 2.4 Four surveyors (two teams of two) survey each site and a pre-determined route is walked with frequent stops (approx every 200m) to check for churring males or any direct observations (e.g., wing clapping, feeding flights etc). Located nightjars are marked on a map of the site with a red dot; this is preferred to using the standard British Trust for Ornithology codes in order to register the locations more accurately. Other species are marked using the BTO codes. All surveyors use hand-held Global Positioning Systems and compasses to facilitate accurate bird registrations. For example, when a churring male is detected the surveyors first locate the position of themselves using a GPS and then determine the direction of the churring

male nightjar from the surveyor location by taking a bearing with a compass (i.e. south west of surveyor position). They then plot the location on the map by estimating the distance by the loudness of the churring. Wherever possible this can be repeated for the same churring male from a different location to cross-reference the location, this is what's known as a re-section. Where the lines meet is the correct location of the churring nightjar. When this is done the initial registrations are mostly surprisingly accurate, however, occasionally the registration needs to be slightly adjusted. Often it is not possible to do a re-section because the birds sometimes only churr for a short time, this situation therefore could result in some error.

- 2.5 One team surveyed the northern section whilst the other team surveyed the southern section. To counteract observer bias the teams would exchange survey areas on the second visit. Furthermore, wherever possible the routes would be walked or surveyed in reverse on the second visit, because male birds churr most frequently just after dusk, and this ensured that most areas were covered at the optimum churring time.
- 2.6 The total number of churring males was achieved by evaluating both first and second visit maps. Only when churring males registered on separate visits were well in excess 200m (approx 350m) apart were they considered different birds. This is the most difficult aspect of the evaluation because it is often subjective; Cadbury (1981) does not detail evaluation, and Gilbert et al (1998) state that the distance should be more than 400m. Experience of the site proves that simultaneous churring males are often less than 200m apart and therefore the 400m criteria summarised by Gilbert (1998) would eliminate many territories. Conway et al (2007) used a 350m criteria therefore this method has been adopted. The total number of churring males has been combined on a master map included in this report.

### **3. Accuracy of survey methods**

3.1 The accuracy of any survey depends upon a number of factors.

- Methodology adopted
- Consistency of the methodology
- Knowledge and experience of the fieldworkers
- Consistency of recording
- Critical summary and evaluation

3.2 Perhaps the most difficult aspect of any survey is the assessment of the survey methods for a) how accurately the presence or absence of a species in a particular area is determined, and b) how accurately or consistently the number of breeding birds is calculated. The method for determining breeding nightjars is defined in section 2 of this report.

3.3 There is often scope for error as the accurate determination of the breeding distribution of some species is made more difficult by non breeding individuals that are feeding, roosting or loafing. However, in the case of nightjar surveys, this element of error is eliminated by the fact that only churring (territorial males) are recorded for the purpose of determining numbers. Nevertheless, some error is inevitable; in particular, determining distance is sometimes problematic and, whilst the methodology used here reduces much error, there are still limitations. Furthermore, two visits are perhaps not sufficient to determine precise territories and indeed record all churring males. Considering these limitations it is generally sensible to build in a 10% error.

3.4 The amount of effort expended in detecting and recording nightjars for the main two visits was equal; however additional effort is occasionally required in small areas. Over recording has been kept to a minimum through careful analysis of first and second visit maps and eliminating birds closer than approximately 350m on separate visits. However, under-recording is also perhaps a possibility. Male nightjars often churr for only a very short time and therefore the possibility of territories remaining undetected is also likely. Many factors

contribute to the possibility of under-recording including time of visit to area and weather.

- 3.5 Registrations of churring nightjars entered on the maps that are relatively close were proven by simultaneous churring or quick successive churring (less than 30 seconds apart). When simultaneous churring does occur it proves that territories can be very close together, therefore the methodology used for evaluation may often result in lower overall numbers than may be the case. That is perhaps why it is sensible to employ a little subjectivity sometimes when evaluating maps.

#### 4. Weather

- 4.1 Churring males favour calm, dry nights. Therefore the survey began on the 18<sup>th</sup> June during a very brief period of suitable weather. The weather thereafter reverted to cold temperatures at night until the 24<sup>th</sup>. The second visit was completed on the 25<sup>th</sup> June in much warmer conditions.

- 4.2 Temperature and wind speed were checked on each visit at the beginning of the surveys (22.00 hrs) and at the end of the survey using an anemometer and thermometer. The data is as follows:

- 4.3 **First visit - Hatfield Moors** 18<sup>th</sup>/19<sup>th</sup> June. Cloud (95/100%).  
At 22.00 hrs; cloud 10%, temp 14c, wind W, 5 mph.  
At 02.15 hrs; cloud 100%, temp 13c, wind W, 7 mph.

**Second visit - Hatfield Moor** 25/26<sup>th</sup> June. Cloud (0%).  
At 22.00 hrs; cloud 0%, temp 17.4c, wind SW, 4 mph  
At 02.00 hrs; cloud 0%, temp 14.2c, wind SW, 2 mph

**Third (part visit to NE section)** 4<sup>th</sup> July. Cloud (100%)  
At 22.00 hrs; cloud 100%, temp 17.2, wind SE, 6 mph  
At 23.00 hrs; cloud 100%, temp 14.7, wind SE, 2mph

5. Results Table 1 (Hatfield Moors)

Nightjar Number	Grid ref	Visit	Weather* conditions	Temperature scale
NJ 1	SE 70360832	2	vg	warm
NJ 2	SE 70680817	2	vg	warm
NJ 3	SE 71600808	1/2	vg	acc/warm
NJ 4	SE 71850789	2	vg	warm
NJ 5	SE 71780770	2	vg	warm
NJ 6	SE 71520772	2	vg	warm
NJ 7	SE 71140799	2/3	vg	warm
NJ 8	SE 70760788	1/2	vg	acc/warm
NJ 9	SE 70300769	2	vg	warm
NJ 10	SE 69760737	2	vg	warm
NJ 11	SE 70110731	1	vg	acc
NJ 12	SE 69720684	1	vg	acc
NJ 13	SE 70080675	2	vg	warm
NJ 14	SE 70700690	1/2	vg	acc/warm
NJ 15	SE 71000688	3	vg	warm
NJ 16	SE 71470673	3	vg	warm
NJ 17	SE 71110652	1	vg	acc
NJ 18	SE 71470642	3	vg	warm
NJ 19	SE 72030597	2/3	vg	warm
NJ 20	SE 72400580	3	vg	warm
NJ 21	SE 71890569	3	vg	warm
NJ 22	SE 71060598	1	vg	acc
NJ 23	SE 71040598	1/3	vg	acc/warm
NJ 24	SE 71500540	1	vg	acc
NJ 25	SE 71050452	1	vg	acc
NJ 26	SE 69850419	2	vg	warm
NJ 27	SE 69520403	2	vg	warm
NJ 28	SE 69720435	2	vg	warm
NJ 29	SE 69370418	2	vg	warm
NJ 30	SE 69040415	2	vg	warm
NJ 31	SE 69550457	1	vg	acc
NJ 32	SE 69130460	2	vg	warm
NJ 33	SE 69020542	1/2	vg	acc/warm
NJ 34	SE 69310612	1/2	vg	acc/warm
NJ 35	SE 69420648	1/2	vg	acc/warm
NJ 36	SE 69420679	2	vg	warm

\* Standard methodology (Note that the temperature scale is an addition resulting from the realisation that cold weather has an adverse effect on nightjar behaviour)

As is evident in table 1, there are more records obtained during warm conditions.

## **5.1 Surveyors and assistants**

- Peter Middleton (both visits)
- Dave Pearce (both visits)
- Dave Little (both visits)
- Alan Cawthrow (both visits)

## **5.2 Survey weather conditions**

- Very Good (wind 0/4mph, dry)
- Good (wind 5/10 mph, dry)
- Poor (wind 11/16, dry or wind 0/8 mph with drizzle)

## **5.3 Temperature scale**

- Cold 0c – 10c
- Acceptable 11c – 14c
- Warm 15c and above

## **6. Summary**

6.1 A total of 36 nightjar territories were located during the survey of Hatfield Moors NNR this year. This number is one more than the previous year when 35 churring nightjars were located. This is a slight increase on the previous year and the largest number recorded there since 1998.

6.2 Most unusual this year was the fact the birds were not churring in the south section of Hatfield on the first visit and it was not particularly cold, in contrast at the same time in the north section many birds were churring. However, over the two visits there was an area where no territories were located, therefore, a brief third visit was made to this area and a further 5 territories were found. Evaluation this year was facilitated by the fact that most territories were widely spaced and churring males in close

- proximity were indeed confirmed by simultaneous churring, therefore the total of 36 is given with a great deal of confidence. The figures are without doubt conservative and if a third visit would have been made to the southern section further territories would almost certainly have been found.
- 6.3 The average density of churring males this year in whole 1 km<sup>2</sup> was 4 per 1km<sup>2</sup>, a slight increase on the previous year. The density is a little lower than at Thorne this year, but again it is just within the range of 4-17 per 1 km<sup>2</sup> given by Berry (1979) for three sites in East Anglia. There are more birds this year in the northern half of the site, whilst the highest density was seven in prime habitat in compartment 24 (Packard Heath). This is exactly the same as last year. On the rest of Hatfield Moors nightjars were again very evenly distributed (see map) and for the second year a territory was located on the reserve boundary east of Packard heath (compartment 22). Only one was recorded there but the area has the potential to support many more.
- 6.4 The experiences this year with the cold conditions confirmed earlier suspicions that nightjars churr less in low temperatures. Considering the above, the methodology has been revised by the author to preclude surveys in temperatures less than 10c.
- 6.5 Other species of note recorded during the surveys were two breeding pairs of long eared owl *Asio otus* (proven my calling juveniles), 4 tawny owl *Strix aluco* (one pair of which had calling young) and one quail *Coturnix coturnix*.

## References

- Berry. R. 1979. Nightjar habitats and breeding in East Anglia. *British Birds* 72: 207-218.
- Cadbury. C. J. 1981. Nightjar census methods. *Bird Study* 28: 1 – 4.
- Clear. N. Nurney. D. 1998. *A Guide to nightjars and related night birds*. Pica Press, Mountford.
- Conway et al. 2007. Status and distribution of European nightjars in the UK in 2004. *Bird Study* 54: 98 – 110

Gilbert et al. 1998. *Bird Monitoring Methods*. RSPB, Sandy, Bedfordshire.