

Breeding Nightjar Survey – 2010 – 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 12th and 27th of June 2010. 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 12th and 23rd June.
- 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 1:10,000 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 On Thorne Moors, 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. For Crowle Moors only one pair of observers surveyed the site for both visits but again the route was done in reverse for the second visit.
- 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 prove 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 in all parts of the study area was equal. Furthermore, 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 12th June during a settled period of suitable weather, albeit cold. The weather remained settled throughout but the cold nights continued until the 21st; the second visit was completed on the 23rd June in 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** 12th/13th June. Cloud (95/100%).
 At 22.00 hrs, cloud 95%, temperature 14c, wind north west 6 mph.
 At 02.15 hrs, cloud 100%, temperature 11c, wind north west 3 mph.

Second visit - Hatfield Moor 25/26th June. Cloud (10/20%).
 At 22.00 hrs, cloud 40%, temperature 19.3c, wind; none
 At 02.00 hrs, cloud 0%, temperature 14.2c, wind; none

5. Results Table 1 (Hatfield Moors)

| Nightjar Number | Grid Ref | Date | Visit | Weather Conditions |
|-----------------|--------------|------------------------------------|-------|--------------------|
| NJ 1 | SE 6961 0720 | 25 th | 2 | very good |
| NJ 2 | SE 6980 0768 | 25 th | 2 | very good |
| NJ 3 | SE 7008 0802 | 25 th | 2 | very good |
| NJ 4 | SE 7040 0800 | 12 th | 1 | very good |
| NJ 5 | SE 7090 0788 | 12 th /25 th | 1/2 | very good |
| NJ 6 | SE 7159 0799 | 12 th /25 th | 1/2 | very good |
| NJ 7 | SE 7174 0776 | 12 th | 1 | very good |
| NJ 8 | SE 7193 0782 | 12 th | 1 | very good |
| NJ 9 | SE 7193 0750 | 25 th | 2 | very good |
| NJ 10 | SE 7041 0705 | 12 th /25 th | 1/2 | very good |

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|-------|--------------|------------------------------------|-----|-----------|
| NJ 11 | SE 7089 0678 | 12 th /25 th | 1/2 | very good |
| NJ 12 | SE 7108 0702 | 12 th | 1 | very good |
| NJ 13 | SE 7130 0652 | 12 th | 1 | very good |
| NJ 14 | SE 7107 0620 | 12 th /25 th | 1/2 | very good |
| NJ 15 | SE 7158 0626 | 12 th | 1 | very good |
| NJ 16 | SE 7196 0625 | 12 th /25 th | 1/2 | very good |
| NJ 17 | SE 7190 0581 | 12 th /25 th | 1/2 | very good |
| NJ 18 | SE 7160 0551 | 25 th | 2 | very good |
| NJ 19 | SE 7112 0556 | 25 th | 2 | very good |
| NJ 20 | SE 7098 0444 | 25 th | 2 | very good |
| NJ 21 | SE 7061 0445 | 25 th | 2 | very good |
| NJ 22 | SE 6987 0401 | 25 th | 2 | very good |
| NJ 23 | SE 6951 0407 | 12 th /25 th | 1/2 | very good |
| NJ 24 | SE 6975 0443 | 12 th /25 th | 2 | very good |
| NJ 25 | SE 6949 0434 | 12 th /25 th | 1/2 | very good |
| NJ 26 | SE 6922 0443 | 25 th | 2 | very good |
| NJ 27 | SE 6932 0460 | 12 th | 1 | very good |
| NJ 28 | SE 6900 0455 | 12 th | 1 | very good |
| NJ 29 | SE 6898 0517 | 25 th | 2 | very good |
| NJ 30 | SE 6905 0545 | 12 th /25 th | 1/2 | very good |
| NJ 31 | SE 6910 0523 | 25 th | 2 | very good |
| NJ 32 | SE 6930 0595 | 12 th /25 th | 1/2 | very good |
| NJ 33 | SE 6921 0610 | 25 th | 2 | very good |
| NJ 34 | SE 6933 0638 | 12 th /25 th | 1/2 | very good |
| NJ 35 | SE 6940 0659 | 25 th | 2 | very good |

5.1 Surveyors and assistants

- Peter Middleton (both visits)
- Dave Pearce (both visits)
- Carl Dixon (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)

6. Summary

- 6.1 A total of 35 nightjar territories were located during the survey of Hatfield Moors NNR this year. This number is four more than the previous year when 31 churring nightjars were located. This is a 13% increase on the previous year and the largest number recorded since 1998.
- 6.2 In spite of the cold weather conditions on the first visit, censusing this year was without problems. Furthermore, evaluation this year was facilitated by the fact that most territories were widely spaced, therefore the total of 35 is given with a great deal of confidence. The figures are indeed conservative, nevertheless, taking into account a + or – 10% error, this would equate to a total this year of between 32 and 38 breeding pairs.
- 6.3 The average density of churring males this year in whole 1 km² was 3.8 per 1km², a slight decrease on the previous year. The density is a little higher than at Thorne this year, but again it is just below the range of 4-17 per 1 km² given by Berry (1979) for three sites in East Anglia. The decrease in density is a direct result of nightjars this year using more of the site, thus emphasising that the site is capable of supporting considerably more. The highest density was seven in prime habitat in compartment 24 (Packard Heath). This is two more than in 2009. This is good news because sheep numbers in this compartment have been drastically reduced on the suspicion that they were having an adverse effect on nightjars. On the rest of Hatfield Moors nightjars were very evenly distributed and a glance at the map reveals that they are very evenly spaced all around the reserve. For the first time for several years churring males were located on the reserve boundary east of Packard heath (compartment 22). Indeed, with management, this compartment has potential for a further increase in population.
- 6.4 The only other species of note were two breeding pair of long eared owl *Asio otus*, 3 tawny owl *Strix aluco*, two singing wood lark *Lollula arborea*, two woodcock *Scolopax rusticola* and two water rails *Rallus aquaticus*.

References

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