Nightjar habitats and breeding in East Anglia

Rob Berry

Numbers of Nightjars have apparently been declining in Britain for some years. A census is needed: this study provides valuable background information.

The characteristic habitat of the Nightjar *Caprimulgus europaeus* is dry heathland with scattered trees, usually silver birch *Betula pendula* or Scots *Pinus sylvestris* and Corsican pine *P. maritima*. A range of other habitats may also be used: chalk downland, open woodland, dense coppice, sand-dunes and even shingle beaches (Bannerman 1955); and, in recent years, clear-felled woods and young pine plantations. Little is known of the species' requirements within these habitats; indeed, the Nightjar has been very little studied recently, although its numbers have been reported to be declining (Stafford 1962, Sharrock 1976). This paper reports a study made during 1968-77.

**Study sites**

**Minsmere**

At Minsmere, Suffolk, the heathland covers 176 ha. Silver birch is the dominant tree species, expanding from denser areas into the open heath. There are also some Corsican pine plantations dating from about 1948 and 1966. Heather *Calluna vulgaris* is the dominant field vegetation, although bracken *Pteridium aquilinum* tends to replace it in areas of dense...
silver birch. Gorse *Ulex europaeus* and western gorse *U. gallii* are sparsely distributed over the open heath.

This site was studied from 1975 to 1977. Nightjar numbers had also been recorded previously: in each year during 1948-58, R. Wolfendale recorded ten pairs; H. E. Axell recorded about 20 pairs in 1959-62, 15 pairs in 1963 and 1964, about 20 again in 1966, possibly 30 pairs in 1967, and about 20 pairs in each year 1968-74. During the three years of the present study, 15, 13 and nine pairs respectively were recorded. Thus, there was no major decline in the last 30 years, but it must be borne in mind that recorded numbers are clearly observer-influenced.

**Dersingham**

At Dersingham Fen, Norfolk, an area of 169 ha consists of a dry heath on a plateau sloping down about 100 m to meet a bog. On the dry area, heather is dominant, with scattered silver birch and bracken, the latter again thicker in the birch areas. Small valleys on the slopes are densely covered with rhododendron *Rhododendron ponticum*. In the bog area, typical plants such as *Sphagnum* mosses, round-leaved sundew *Drosera rotundifolia*, common cottongrass *Eriophorum angustifolium* and bog asphodel *Narthecium ossifragum* are found. Within the bog, there are small raised plateaux, covered with vegetation like that of the dry slopes: heather and silver birch. Birch and Scots pines are invading the southern end of the bog.

This site was studied from 1970 to 1977, and held 14-23 pairs of Nightjars, with no evidence of a decline.

**Leziate**

Leziate, King's Lynn, Norfolk, an area of 126 ha, has scattered silver birches and Scots pines. Heather once more is dominant in the field layer, with bracken again concentrated in the dense birch areas. Where sand extraction has ceased and the land has been levelled, heather, silver birch and, in the damper areas, round-leaved sundew are recolonising. This site was studied during 1968-77, and held five to nine pairs of Nightjars.

**Methods**

At each site, churring males were plotted on a 1:10,000-scale map. As males churred from various song perches around their territories, there was always the danger of plotting the same bird twice. Therefore, at least three evening visits were made in May to establish exact numbers. To check the accuracy of the plottings, an effort was made to find several nests in each of the three sites. In all, eight to ten visits of between one and three hours’ duration were made to each study area throughout the breeding season. The progress of all nests found was followed until either young fledged or the nest failed.

**Behaviour**

The first Nightjars usually arrived during the second week of May and started churring shortly after; occasionally, however, churring was
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recorded in April. For a few days in April 1977, at Minsmere, a male churred in an area of fairly dense woodland away from the traditional nest sites; after it ceased, 17 days passed before another was heard. At Dersingham, Nightjars were also recorded churring during the last week of April, consistently outside the traditional breeding areas, but they ceased after a short period.

During the breeding season, the males roosted on the ground, usually about 50 m, and exceptionally 100 m, from the incubating female. This accords with the findings of Lack (1932). There was remarkable fidelity to roost sites, both from year to year and within each breeding season. On three occasions when the young were near fledging, the males roosted with the females and young at the nest site.

In the evening, after leaving the roost area, a male Nightjar will churr at various regular song posts in his territory, and then either relieve the female at the nest for a period or gather with other males at a communal feeding area over the heath/fen or woodland plantations. Numerous cases of communal feeding were recorded. At Dersingham Fen, this was regular

![Graph showing numbers of breeding pairs of Nightjars Caprimulgus europaeus at Minsmere (Suffolk), Dersingham (Norfolk) and Lexiate (Norfolk).]
Table 1. Primary vegetation of 43 territories of Nightjars *Caprimulgus europaeus*, East Anglia, 1975

<table>
<thead>
<tr>
<th></th>
<th>MINSMERE</th>
<th>DERSINGHAM</th>
<th>LEZIATE</th>
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<tbody>
<tr>
<td></td>
<td>Dom</td>
<td>Pres</td>
<td>Abs</td>
</tr>
<tr>
<td>Heather <em>Calluna vulgaris</em></td>
<td>13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Silver birch <em>Betula pendula</em></td>
<td>8</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Pine <em>Pinus</em></td>
<td>-</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Bracken <em>Pteridium aquilinum</em></td>
<td>-</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

in 1970, most memorably on the evening of 14th June 1974 when 14 Nightjars were observed together in the failing light hawking for insects over a bog area of no more than 3 ha. At Minsmere, in June 1965, 12 were seen together over the heath during late evening; and, on 21st May 1976, up to four were observed over the same area. Another record concerned eight individuals together over a sand quarry at Leziate. These crepuscular gatherings were always away from any Nightjar breeding territories, and in all cases both males and females were present. Communal feeding was also familiar to Lack (1932): ‘it is well known that several Nightjars will foregather to a place where food is especially abundant e.g. around an old oak [*Quercus*] tree.’

**Habitat**

In 1975, the vegetation of 23 Nightjar territories at Dersingham, 13 at Minsmere and seven at Leziate was studied within 100 m of the centre of activity of each singing male (table 1 and figs. 2-4). Heather was always the

![Fig. 2. Distribution of breeding Nightjars *Caprimulgus europaeus* at Minsmere, Suffolk, 1976. Scale 1: 20,000. Representations of nest sites/territories are diagrammatic](image-url)
Nightjars *Caprimulgus europaeus*, Surrey, August 1974 (Michael W. Richards)
99 & 100. Nightjars *Caprimulgus europaeus*, Suffolk, June 1948 (Eric Hosking)
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dominant ground vegetation at Minsmere and Leziate. In slightly fewer than half of those at Dersingham, heather was merely present, being replaced in the lower, damper areas by *Sphagnum* moss and associated stations of round-leaved sundew and common cottongrass. At all three study sites, the heather varied considerably in height from 10 cm to 90 cm; it was interspersed with a few plants of bell heather *Erica cinerea* and, at Minsmere and Dersingham, even with cross-leaved heath *E. tetralix*. There were occasional patches of bare ground within the heather areas, particularly around the silver birches and Scots pines.

Silver birch occurred in all the territories studied, with considerable variation in height and density. Growth ranged from 1 m to 7 m, and from isolated trees to dense thickets. At all sites, the birch was advancing rapidly into the heath, and at Dersingham into the bog as well. Scots and Corsican pines were the only other widespread trees, but were never dominant; the dense plantations (ten to 20 years old) were not used for breeding, although one Scots pine plantation at Snettisham, close to the Dersingham study area, held a pair of Nightjars for eight years, after which it became dense and overgrown.

Bracken was found in a number of territories in each of the three sites, but was never the dominant ground vegetation; the thickest areas were always under the shelter of and within the dense birch areas, and growth was considerably retarded once it penetrated the open heath. While heather, silver birch, Scots and Corsican pines and bracken formed the primary vegetation of the territories studied, all those at Minsmere included a scattering of gorse and western gorse. Some Dersingham territor-

Fig. 3. Distribution of breeding Nightjars *Caprimulgus europaeus* at Dersingham Fen, Norfolk, 1975. Scale 1:20,000. Representations of nest sites/territories are diagrammatic.
Fig. 4. Distribution of breeding Nightjars *Caprimulgus europaeus* at Leziate, Norfolk, 1975. Scale 1: 20,000. Representations of nest sites/territories are diagrammatic.

Nest sites contained dense clumps of rhododendron. A number of territories at all three study sites were transected by public footpaths or bridleways. Nightjars seemed undeterred by these, on one occasion even nesting within a few metres of a public right of way.

**Density and territory size**

The densities of Nightjars at each of the three study sites varied considerably from year to year (table 2). The maximum was one pair per 5.87 ha, at Minsmere in 1967 (when the younger Corsican pine plantations were more suitable for breeding Nightjars); the minimum was one pair per 25.2 ha, at Leziate in 1968, but this site included sand-quarrying areas which were obviously unsuitable.

At Minsmere, the site for which most figures are available, the average density during 1948-77 was one pair per 12.8 ha. This accords well with Lack’s (1932) findings on Kelling Heath, Norfolk, where ‘the density can be reckoned as one pair per 30 acres (12.14 ha)’. 

**Table 2. Highest and lowest densities of breeding Nightjars *Caprimulgus europaeus* at three study sites in East Anglia**

<table>
<thead>
<tr>
<th>Site</th>
<th>Number of Pairs</th>
<th>Density (ha per pair)</th>
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<tbody>
<tr>
<td>Minsmere</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffolk (176 ha)</td>
<td>39 (1967)</td>
<td>5.87</td>
</tr>
<tr>
<td></td>
<td>9 (1977)</td>
<td>19.56</td>
</tr>
<tr>
<td>Dersingham</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfolk (169 ha)</td>
<td>23 (1975)</td>
<td>7.35</td>
</tr>
<tr>
<td></td>
<td>14 (1971)</td>
<td>12.07</td>
</tr>
<tr>
<td>Leziate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfolk (126 ha)</td>
<td>9 (1969)</td>
<td>14.00</td>
</tr>
<tr>
<td></td>
<td>5 (1968)</td>
<td>25.20</td>
</tr>
</tbody>
</table>
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Actual territory sizes, however, were relatively small, each male's singing posts encompassing an area of approximately 5-6 ha. In both 1976 and 1977, at Minsmere, three pairs bred within an area of 16 ha, an average territory size of 5.3 ha.

It is evident that actual territory sizes were smaller than density figures imply because the birds were not uniformly distributed but tended to occur in a broad band along advancing woodland edges. Mean distances from nearest neighbour were 164 m at Dersingham and 172 m at Minsmere. Uniformly spaced at such intervals, territories would be about 2.4 ha in extent, a density greater than any found. The discrepancy is no doubt due to feeding areas being outside the territories, as at Dersingham, where Nightjars nested on the dry heath and fed over the bog.

Nest site selection

Nightjars were very faithful to their nest-site areas from year to year: although none was found nesting in a clearing used in earlier seasons, one nest at Minsmere in 1977 was only 45 m from the previous year’s.

During 1968-77, a total of 18 nests was located. They had several features in common. All were situated near or under a sheltering tree: once a Scots pine, but in all other cases a silver birch. The average height of birches at the nest, and indeed of those within a 15-m radius, was only 3 m. There was always a scattering of trees in the vicinity of the nest site, but dense areas of birch or pine were avoided, even though small, apparently suitable clearings were available. A very small clearing was always used for the site, the largest recorded being only 2 m × 2m. Another apparently significant feature of sites was the presence of heather, which ranged from 20 cm to 60 cm in height and from dense to sparse distribution. It was utilised a great deal by young Nightjars for concealment during the day, and quite possibly for cover in hot weather such as that in 1976. Bracken was recorded at only seven sites: it was always very sparse and in most cases consisted of only half a dozen fronds. Otherwise suitable clearings in the bracken areas were avoided, suggesting that these were not favoured Nightjar nest sites. Dead logs were found at only three nests, although Bannerman (1955) mentioned that these occurred frequently.

The height and distribution of trees, and the size of clearings in the heather beside them, would seem the two factors which influence a Nightjar’s choice of nest site. The optimum nesting habitat is thus within the area where silver birch scrub is expanding across open heathland, or where glades of heather up to 80-100 m in diameter have survived within the dense birch.

Breeding

The eggs were laid in a bare and very shallow scrape, always to one side of the clearing, which enabled the incubating bird to blend with the surrounding vegetation. Two eggs proved to be the rule in all nests found. Of eight pairs at Minsmere in 1976-77, four reared two young, one reared one (second egg infertile) and three failed (one with eggs, two with young): thus, eight nests produced nine young. Both failures with young
were thought to be caused by foxes *Vulpes vulpes*: in each case an occupied earth and fox faeces were found nearby.

Males were never found incubating eggs during the day; this was also the experience of Lack (1932). Second clutches were recorded on single occasions at Leziate in 1969 and at Dersingham in 1972, but none was found at Minsmere in 1976-77, despite a thorough search. This is incompatible with Lack’s (1929) observation that the Nightjar is normally double-brooded and that the male regularly takes over the young when they are about 13 days old in order to allow the female to start the second clutch (which she would otherwise not have time to do). On no occasion during the present study was the male found in charge of the young, even at the two sites with double broods.
Soon after hatching, the young move away from the nest site, the distance travelled depending on the access from the clearing: if there is a surrounding dense growth of heather, they will move to the edge for cover and remain there until they fledge. Many sites, however, have the old runs of rabbits *Oryctolagus cuniculus* or narrow pathways leading off them, and the young use these to move from the nest area. In 1969, at Leziate, two travelled over 25 m from the time they hatched until they fledged, but 2-3 m was normal. Lack (1932) also noted variable behaviour by the young and stated: 'I have found young Nightjars which wandered far from the nest when a few days old, usually, but not only, in cases when the nest was repeatedly visited. On the other hand I have known them remain within a three foot [1 m] radius of the nest until almost able to fly.'

**Causes of decline**

That the Nightjar is declining seriously in Britain was borne in mind throughout the study. Possible reasons were sought.

The prime habitat of open heath with encroaching silver birch is, by its very nature, self-destructing: once the birch has completed its advance, the area has reverted to woodland and will support few, if any, breeding Nightjars. One natural vegetation control is grazing rabbits. This species itself, however, suffered a reversal in the early 1950s with the onset of myxomatosis, and areas at Minsmere and elsewhere became rapidly overgrown while the rabbit population was low. This presumably would have benefited the Nightjar, and there is some evidence of this at Minsmere.

The decline may also be primarily associated with climatic change, as with other heathland species such as the Red-backed Shrike *Lanius collurio*, which is also retreating (Bibby 1973). The recent succession of cold, wet springs may have contributed by delaying breeding until late in the season, thus allowing time for only one successful brood instead of two. This possibility would certainly profit from further study.

Another factor possibly exacerbating the decline is human disturbance. Most obvious are sand quarrying at Leziate and the use of part of the heath at Dersingham as a rubbish tip, while leisure activities on the heaths in the breeding season may be damaging (many Nightjars nest close to footpaths). The study found, however, only one nest which possibly failed through human disturbance.

**Management proposals**

Conservation of the Nightjar is clearly desirable, and necessary, where possible. Some suggestions for management of suitable habitat are outlined below.

Pine plantations which have reached 3 m (about ten years old) are usually unsuitable for breeding Nightjars. In such cases, scattered areas of 20 m × 20 m could be clear-felled throughout the plantation; this could be easily undertaken at a nature reserve such as Minsmere. Similarly, areas within the dense silver birch could be opened up to form large glades. Small clumps of six to ten trees of suitable height should be left standing, with heather and other debris beneath them. Such work has
recently been carried out at Minsmere, and the area will be carefully
monitored during the next six years or so to ascertain the use made of the
site by Nightjars and other species.

The provision of glades could also improve feeding prospects. Com­
munal feeding is an important feature of Nightjar behaviour: with better
knowledge, suitable conditions could be provided.

Management of heathland areas is the reverse process: the trees are
left, and the heather beneath them is removed to expose the bare ground
for suitable nesting sites. This is necessary because, as a rule, when silver
birches are expanding over open heathland (as is happening at Dersing­
ham and Minsmere), they are usually so prolific that they even grow
through the dense heather and so have no suitable clearings beneath
them. Intentional or accidental burning of heather, which occurs widely,
provides breeding habitat if birch or pine clumps, with some heather
cover, remain; but this causes much damage to other fauna and pro­
motes the spread of bracken, and is therefore not to be recommended.

When undertaking any type of management, the existing habitat should
always be studied in order to ensure that the work will not be detrimental
to other species.

Acknowledgements

I should like to thank Dr C. J. Bibby for his guidance and comments on several earlier
drafts of this paper; also Mrs F. C. Britton for making available some of her late husband's
data for Leziate, and Dr C. J. Cadbury for supplying Nightjar figures for Dersingham for
1976-77.

Summary

Habitats and breeding of the Nightjar Caprimulgus europaeus were studied at three sites in
East Anglia. Breeding behaviour and instances of communal feeding are described. The
main habitat features were heather Calluna Erica and silver birch Betula pendula; plantations
of Scots Pinus sylvestris and Corsican pine P. maritima and dense thickets were avoided.

Densities of breeding pairs are considered. Areas chosen for nest sites were investigated and
two factors, a small clearing and a sheltering tree, usually a silver birch averaging 3 m in
height, were found to be typical. The normal clutch size was two eggs, and second clutches
were found only twice (contra Lack 1929). Possible reasons for the species' decline in
Britain are discussed: influencing factors could include the advance of silver birch over
heathland, which has accelerated in some areas since myxomatosis; the fact that usually
only one brood now seems to be reared; and human disturbance on the heaths for indus­
trial and leisure purposes. Some management possibilities are suggested to contribute to
the conservation of the Nightjar in Britain.

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