



Little Owl

Athene noctua

1. INTRODUCTION

Little owls were introduced into several areas of England in the middle of the 19th century, and are now found breeding throughout lowland England, in some areas of Wales and in southern Scotland (Gibbons *et al.*, 1993; Gordon, 2007). Only occasional vagrants have been reported in Ireland (Hutchison, 1989) and they are absent from the Isle of Man. Birds breeding in Great Britain and mainland Europe are sedentary, seldom dispersing more than a few kilometres from their natal site (Glue, 2002a). Little owls cannot be sexed in the field. Before their autumn moult, juveniles can be separated from adults by their paler, greyer and more uniformly patterned plumage (Cramp, 1985). Little owls can breed when one year old.

Further information on the biology and ecology of little owls can be found in Van Nieuwenhuysen *et al.* (2008) and Leigh (in press).

Annual cycle

Breeding Activity	Peak Period	Range	Duration (days)
Occupation of home range		All year	
Territorial display		All year (but less display in winter)	
Courtship		March to April	
Egg laying	Mid-April to mid-May	Mid-March to late June	2 to 5
Incubation	Mid-April to early June	Mid-March to early July	28 to 33
Hatching	Late May to early June	Mid-April to early July	
Young in nest	Late May to early July	Mid-April to early August	19 to 28
Fledging		Late May to early August	At 28 to 32 days old
Juvenile dispersal		Late June to early September	

2 HABITAT, HOME RANGE, NESTS AND BREEDING

2.1 Habitat

In England and Wales, little owls breed in a wide range of habitats, generally below 122 m ASL but up to 320 m ASL (Glue & Scott, 1980). They mainly occupy agricultural areas but are

also found in woodland, parks, gardens, cemeteries and quarries and occasionally on heaths, moors, wetlands and coastal areas. The presence of fence posts is important as these provide hunting perches (Loske, 1986).

2.2 Home range

Male little owls defend their home range throughout the year (Finck, 1990), although they are less aggressive in the winter. Home range size varies according to the stage in the breeding cycle (Génot & Nieuwenhuyse, 2002). In southern England home ranges averaged 35 ha in water meadows and 38 ha in mixed farmland (Glue & Scott, 1980); in northeast France, birds actively foraged over 27 to 44% of their home range (Génot & Wilhelm, 1993). Various studies have reported densities of 0.02–41.67 territories per km² (Génot & Nieuwenhuyse, 2002). Nests may occur as close as 240 m apart, and little owls have been recorded breeding 2 m from a barn owl nest (Glue & Scott, 1980). The availability of nests sites appears to be the limiting factor in areas where food is abundant (Exo, 1992).

2.3 Nest sites

In England and Wales, little owls breed in holes in deciduous trees (92% of nests examined in detail), rabbit burrows, or cracks in rock faces (Glue & Scott, 1980). They may also use man-made structures such as farm buildings, stone walls and haystacks. In trees, they nest mainly in clefts and hollow branches but they may also use the tree bole or roots, vertical holes in trunks, pollards, fallen branches or trunks, and magpie nests (<1% of nests). Nests are an average of 3 m (range 0.3–12.2 m; Glue & Scott, 1980) above the ground. The commonest trees used for nesting are oak, ash and fruit trees. Nest holes may be used for up to 10 years but individual females may or may not use the same nest hole from year to year (Génot & Nieuwenhuyse, 2002). Little owls will use nest boxes (Génot & Nieuwenhuyse, 2002) although the take up appears to vary between areas, perhaps related to the availability of natural sites (Barn Owl Trust, 2000). It may take several years for birds to take up residence, often using the box for roosting prior to any use for breeding.

2.4 Nests

No nest is constructed, the clutch is laid on the floor of the cavity in use, although the nest chamber may be scraped.

2.5 Clutch size and incubation

Clutch size varies from 1–7 eggs (Génot & Nieuwenhuyse, 2002) and has been shown to decrease with population density (Bultot *et al.*, 2001). The BTO Nest Record Scheme gives an average clutch size of 3.5 (n=592), although Leigh (2001) found an average of 2.5 in northwest England (between 1993 and 2000). Eggs are normally laid on consecutive days but intervals of 2–4 days have been recorded in captive birds (Génot & Nieuwenhuyse, 2002) and the laying period can last 10–12 days for a clutch of 6–7 eggs. Weather and prey availability may affect both the duration of the laying period and the final clutch size. Eggs are laid from mid-March to late June, with most birds laying between mid-April and the first ten days of May. Incubation may begin with the first or second egg or be delayed until the clutch is completed. It is carried out by the female (perhaps with assistance from the male; Mikkola, 1983) and usually lasts 28–33 days (Glue & Scott, 1980), although it may be longer or shorter (18 days (in captivity) to 35 days; Génot & Nieuwenhuyse, 2002). During this time the birds are secretive and the male feeds the female. Lost clutches are occasionally replaced and rarely, a second brood may be attempted after the first has fledged (Mikkola, 1983).

2.6 Brood size and fledging

Hatching may be asynchronous or nearly synchronous. If food is short, then not all young will survive and cannibalism may occur (Mikkola, 1983). For the first 10–15 days the male provides all the food while the female broods the chicks. After this time, the female also hunts. The chicks are normally fed between dusk and midnight, and again from 02:00h until dawn (Glue & Scott, 1980). The young first emerge from the nest at 19–28 days of age when they are very active but often hide in the branches or vegetation surrounding the nest (Glue & Scott, 1980; Mitchell, 1994). They fledge after 28–32 days (Nieuwenhuysen *et al.*, 2008), exceptionally longer, and are dependent on their parents for a further month after fledging (Génot & Nieuwenhuysen, 2002). Breeding success depends on the condition of the female before laying (Gassmann & Bäumer, 1993). High levels of rain in March, promoting a higher availability of earthworm prey, are associated with the production of larger broods (Gassmann *et al.*, 1994).

3. SURVEY TECHNIQUES

CAUTION *Goggles and face protection should be worn if looking inside a confined space for a nest site, particularly if more aggressive tawny owls may be present. Appropriate health and safety precautions should be taken if working at night and if nest inspection visits involve climbing (see Section 7.10 of Introduction).*

3.1 Breeding season visit schedule

Visit 1 is required to establish home range use and to map territories, Visits 2 and 3 to confirm breeding, and Visit 4 to record breeding success. It is preferable to make all four visits even if occupation is not confirmed after the early visits. Little owls are most active around dawn and at dusk but frequently perch in the open during the day (Mikkola, 1983).

Visit 1 (several preferable)	March to April	To check for occupancy
Visit 2	Mid-April to May	To locate active nests
Visit 3	June	To check for young
Visit 4	July to August	To check for fledged young

3.2 Signs of occupancy

3.2.1 Locating home ranges

Occupied home ranges can be located by listening for the males calling in March and April. The positions of calling birds should be noted on a map of the study area. If a series of visits is made at this time, it is possible to delineate home ranges by mapping the locations from which calls are heard. The amount of calling is density dependent, in areas with low density populations little owls call less than in areas with high density populations. It is very difficult to determine the sex from the call alone, although female calls have been described as more high-pitched and nasal. During pre-copulation behaviour the female is said to give a begging display accompanied with snoring sounds and during copulation the male is said to utter a guttural chugging sound.

Little owls can also be surveyed by broadcasting the male territorial call. Depending on the weather, calls of responding male owls can be heard up to 600 m away (Nieuwenhuysen *et al.*, 2008). Surveys should be carried out on still nights with a maximum of 500 m between broadcast points. The positions of calling birds should be noted on a map of the study area.

Such surveys, which may be preferable to cold searching if large areas are to be covered, are best carried out during the owls' courtship period in March and April. The most effective time for survey is just after dusk and before dawn, to coincide with activity peaks of little owls. Rain, wind (> 3 on the Beaufort scale) and low temperatures inhibit calling, although temperature has a greater effect at dusk than at dawn. Little owls at their normal perches also respond more effectively to strange calls rather than those of neighbouring birds (Hardouin *et al.*, 2006). Visual displays have not been highlighted as of use in surveying this species.

3.2.2 Locating roosts

The presence of an active roost confirms occupation, as little owls remain within their home ranges throughout the year. Little owls will use cavities as roost sites, although they often roost out in the open on a post, tree, telegraph wire or isolated building (Mikkola, 1983; Mitchell, 1994). Some roosts can be located by searching suitable habitat. All holes in trees, rabbit burrows and cracks in rock faces or buildings should be checked. Active roosts will have fresh pellets, down and moulted feathers.

3.2.3 Recognition of signs

Little owl pellets are generally fragile and small (15–40 mm by 10–20 mm; Mikkola, 1983; Brown *et al.*, 2003). The exact colour and form depends on diet but they often contain insect fragments and may include plant material. Both ends are usually rounded but they can be tapered at one end and resemble kestrel pellets (Mikkola, 1983; Cramp, 1985; Brown *et al.*, 2003). In England, pellet contents change from mostly small mammal remains in the winter and early breeding period to almost all invertebrate remains in the fledging period.

3.2.4 Evidence of occupancy

A home range is occupied if a calling male is recorded on more than one occasion or an active roost is found.

3.3 Evidence of breeding

3.3.1 Locating active nests

Once a home range has been located, it should be systematically searched for an active nest. Faecal droppings (coffee-cream in colour) and pellets will occur below perches close to active nests. Down may also be seen at the entrance to a nest hole. Later in the breeding cycle, active nests can also be located from the characteristic food begging calls of the young, which are made from the age of 12–14 days onwards and become more pronounced as they grow older (Glue & Scott, 1980). Searches for potential nest sites can also be made in winter, prior to the spring surveys.

Some little owls will use one or more cavities near their nest site as 'larders' in which they prepare, and possibly store, prey items before feeding them to their chicks (Hibbert-Ware, 1938). Therefore, owls repeatedly carrying food into a cavity may not be visiting a nest, and this behaviour alone cannot be taken as evidence of breeding.

A mirror and light source attached to a long/extendable handle or pole can be a useful tool for checking cavities.

3.3.2 Evidence for fledging

Fledged young can be located by listening for their food begging calls between dusk and midnight in late May and June. Counts of such young may not be accurate, however, as they may move between calls. The best estimate of the number fledged from a nest is obtained by

counting well-feathered young in or around the nest before they disperse. This may require several visits because not all of the young may be visible or emerge on a given visit and some may hide in the foliage surrounding the nest site. The fieldworker should record the approximate age of the young at the time when brood size is recorded.

3.4 Evidence for non-breeding

If no active nest can be found in an occupied home range after careful searching, and no young are located during the appropriate visits in June and July/August, this provides evidence for non-breeding.

3.5 Ageing and sexing young

No measurement data for ageing and sexing have been found for little owls in Britain and Ireland. As a guide to ageing young approximately:

- the short white down, with which the young hatch, changes to a greyer colour by the age of one week;
- the eyes open at around eight days of age;
- the down becomes sparser and the short facial feathers begin to develop after two weeks of age; and
- the head, breast, nape and flanks are all well feathered by the age of three weeks and the young become mobile in the nest chamber.

Photographs of little owl nestlings at various stages of development are included in Plates 73 to 78.

4. SURVEYS OUTSIDE THE BREEDING SEASON

Calling males can be located at any time of the year but they call less often in winter. Visits should be made at dusk on calm, mild nights when little owls can be located by listening or by broadcasting calls (Section 3.2.1). The location of calling birds should be mapped. Multiple visits will be required to delineate each home range accurately. These can then be searched during daylight to locate roosts and/or birds.