



# Snowy Owl

*Bubo scandiacus*

## 1. INTRODUCTION

Snowy owls have a circumpolar distribution, breeding in Fennoscandia, Arctic Russia, Alaska, northern Canada and northeast Greenland. They are highly nomadic and may migrate southwards in the winter, when a few may reach Britain and Ireland. The numbers of owls that are found in winter in southern areas may be linked to cyclic fluctuations in small mammal populations in the Arctic, with more individuals coming south when populations crash (Gross, 1947). Breeding has been recorded in Scotland and Ireland. A pair of snowy owls bred successfully on Fetlar in Shetland from 1967 to 1975 after which time the male disappeared and was not replaced, although 2-4 females were regularly recorded on the island in subsequent years and infertile eggs were laid several times (Thom, 1986; Gibbons *et al.*, 1993; Pennington, 2007). In Ireland, a pair bred unsuccessfully in Glenveagh National Park in Donegal in 2001 and there is also anecdotal evidence that a pair bred successfully in West Donegal in 1999, with reports from local people of five white owls in an area where an adult pair were photographed. Birds have summered in other parts of Scotland and Ireland but breeding has not been recorded. The snowy owls that bred in Shetland were sedentary. Male snowy owls are whiter and smaller than the females. Immature birds can be distinguished from adults by their heavy barring until they moult at one year of age (Cramp, 1985; Mikkola, 1983). The age of first breeding is not known but is probably not until at least two years old (Cramp, 1985).

## Annual cycle

Breeding Activity	Peak Period	Range	Duration (days)
Occupation of home range		All year (Shetland)	
Courtship		Early April to mid May	
Laying	May	May	2 to 26
Incubation	Early May to mid June	Early May to mid June	30 to 34
Hatching	June	June	
Young in nest	June to July	June to July	14 to 28
Fledging		July to August	At 43 to 50 days old
Juvenile dispersal		September	

Note that most of the timings given here do not refer to Britain and Ireland but they should still give a reasonable approximation; exact timings are very variable across the breeding range, depending on snow thaw.

## 2. HABITAT, HOME RANGE, NESTS AND BREEDING

### 2.1 Habitat

In the Arctic, snowy owls breed in low open tundra, often near the coast (Cramp, 1985). In Norway, they breed on mountain plateaux at 1,100–1,500 m ASL (Bannerman, 1955). They avoid damp areas and use dry hummocks, tussocks and rocks as perches (Cramp, 1985). In Britain and Ireland, snowy owls have frequented arctic/alpine mountain plateaux and heather/grass moorland as well as coastal farmland and machair.

### 2.2 Home range

In the breeding season, the size of the home range varies with the food supply; in suitable terrain with a favourable food supply, it can be as small as 75 ha (Watson, 1957). Only the immediate nesting territory is defended. Snowy owls are solitary in winter. In Canada, males tend to be nomadic, while females defend territories of 150–450 ha in extent for periods of up to 80 days (Boxall & Lein, 1982).

### 2.3 Nest sites

Snowy owls nest on the ground, normally on a raised hummock, rocky outcrop or ridge where the snow melts early.

### 2.4 Nests

The nest is a slight scrape, which may be lined with small pieces of vegetation. Nests are not normally re-used in successive seasons (Watson, 1957). The nests in Shetland were on open moorland with grass, heather and rocky outcrops (Sharrock, 1976). In Glenveagh, Ireland, the nest was in blanket bog on the slope of a raised valley with rocky outcrops and dry heath nearby.

### 2.5 Clutch size and incubation

Clutch size varies with the availability of food and ranges from 2–14 eggs (normally 3–9). The pair that bred in Shetland produced one clutch of four eggs, four clutches of five eggs, three clutches of six eggs and one clutch of seven eggs (M. Robinson in Cramp, 1985). In Ireland the pair which bred in Glenveagh in 2001 laid four eggs. The eggs are laid at 2-day intervals and are incubated for an average of 32 days (range 30–34 days) (Mikkola, 1983; Cramp, 1985). Incubation, which begins with the first egg, is carried out by the female who is fed on the nest by the male (Cramp, 1985).

### 2.6 Brood size and fledging

The eggs hatch asynchronously and the young are brooded by the female for about 21 days (Cramp, 1985) or until they leave the nest. The male provides food to the female who feeds the young (Mikkola, 1983), with both sexes foraging for food once the young are well-grown. There is evidence that the male may feed chicks once they have left the nest (Taylor, 1973); in Shetland, large young took prey from the male but he was often prevented from feeding young by the female (Tulloch, 1969; Mikkola, 1983). At one nest in southern Norway, prey items were delivered every 10–15 minutes between 23:00h and 01:00h (Hagen, 1960; cited in Mikkola, 1983 and Cramp, 1985). In Shetland, 91% of prey items were brought to young between 18:00h and 06:00h, and 60% of these were between 21:00h and 03:00h (Tulloch, 1969). From 14–28 days of age, the young may leave the nest and hide in the surrounding vegetation. They fledge at 43–50 days (average 45 days, M. Robinson in Cramp, 1985) but do not become independent for at least a further 2–5 weeks.

## 3. SURVEY TECHNIQUES

**CAUTION** *Snowy owls should not be disturbed during laying or incubation. Due to the rarity of the species within Britain and Ireland, all observations on the breeding of this species should be made from a distance, unless there is a specific need to collect information on clutch or brood size.*

### 3.1 Breeding season visit schedule

The species is listed on Schedule 1 in Great Britain (see Section 7.1.1 of Introduction). It is recommended that at least two visits (Visits 1 and 4) are made to confirm occupancy and breeding, even if no signs of occupancy are found during the earlier visit(s). Snowy owls are most active between dusk and dawn although during midsummer at high latitudes they must also hunt by daylight. They can be located by searching for roosting birds (which are often conspicuous) during the daytime. Visits to view active birds should be made during the evening or early morning.

Visit 1	April to early May	To check for occupancy
Visit 2	May	To locate active nests
Visit 3	June to July	To check for young
Visit 4	August	To check for fledged young

### 3.2 Signs of occupancy

#### 3.2.1 Locating home ranges

Snowy owls are large and conspicuous and can sit motionless for long periods. Male snowy owls carry out display flights (usually when the female is close by), involving flying with wings held in a deep 'V' at the top of each stroke, causing undulating flight, with drops of 1.5–3 m between down-strokes. Such flights are probably most frequent and complete early in the season, may involve the male carrying prey, and may be followed by a 'mantling display' on the ground once the prey is dropped (Taylor, 1973; Cramp, 1985).

Once a pair of owls has been seen or is suspected to be present, the fieldworker should search the area systematically, checking all rocky areas for sitting birds. The location of any snowy owl signs (moulted feathers and pellets) should also be noted. Searches are easier if there is no snow and snowy owls will use the first areas to become clear of snow.

#### 3.2.2 Locating roosts

Snowy owls roost on the ground during the day and are large and conspicuous enough to be seen from some distance.

#### 3.2.3 Recognition of signs

Snowy owl pellets are large, (49–153 mm long x 20–43 mm diameter), irregular and loosely compressed, containing large bone fragments from prey such as rodents, rabbits and birds (Mikkola, 1983; Cramp, 1985; Brown *et al.*, 2003). They are distinctive in that they often contain snowy owl feathers.

#### 3.2.4 Evidence for occupancy

Sightings of a single bird or a pair on several occasions within the same area provide evidence for occupancy.

### 3.3 Evidence of breeding

#### 3.3.1 Locating active nests

Snowy owls normally nest on dry hummocks or ridges, where the snow melts early. Systematic searches of all suitable areas should be made with appropriate care taken to avoid disturbing incubating females. During the day, the male may be found perched near to the nest. Nests may also be located through observations of hunting owls in the evening or early morning when snowy owls may carry prey directly back to the nest. Even if the owls are not observed going as far as the nest, the direction in which the prey is carried can suggest where searches should be made subsequently.

#### 3.3.2 Evidence for fledging

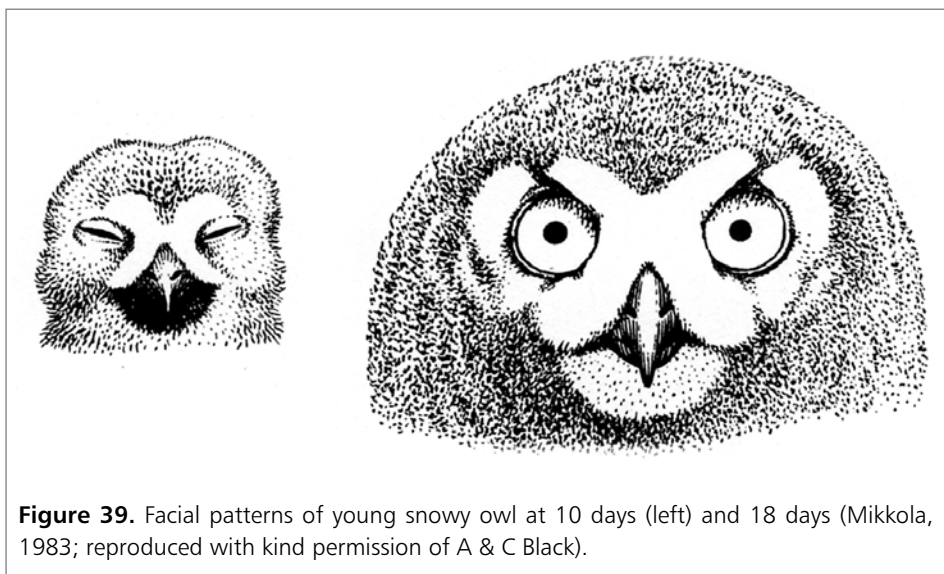
Counts can be made of recently fledged chicks close to the nest, and they are particularly conspicuous when an adult brings prey. Before fledging, large young are more difficult to count, as they leave the nest and hide.

### 3.4 Evidence for non-breeding

If a pair of snowy owls occupies a nesting territory, and an active nest or fledged young are not found despite comprehensive searches at the appropriate times, then this provides evidence for non-breeding.

### 3.5 Ageing and sexing young

No measurement data for ageing and sexing young have been found. As a guide, the white first down is replaced by grey second down from 5-10 days, and chicks appear grey from 8-14 days (Cramp, 1985). At 10 days old the face is dark grey with a characteristic white X-mark between the eyes, which looks more obvious by 18-20 days, and then gradually disappears as white feathers grow in over the face (Cramp, 1985; Mikkola, 1983; Figure 39). For developing chicks on Shetland, Tulloch (1969) reports that the eyes were fully open by 9 days and by 23 days the irides were the same golden yellow as the adults; the whitish primaries and tail feathers were visibly sprouting by about 30 days.



**Figure 39.** Facial patterns of young snowy owl at 10 days (left) and 18 days (Mikkola, 1983; reproduced with kind permission of A & C Black).

## 4. SURVEYS OUTSIDE THE BREEDING SEASON

The number of snowy owls holding winter territories in an area can be surveyed using the methods in Section 3.2.1. Snowy owls have crepuscular and nocturnal foraging habits in the winter, remaining largely inactive during the day (Boxall & Lein, 1989).