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NESTBOXES FOR KESTRELS

by M. Canham

Abstract

Newly planted forests with rank ground vegetation provide ideal foraging areas for kestrels which prey largely on field voles. Whether or not kestrels breed in these areas depends on the availability of suitable nest sites. Kestrels will breed successfully in nestboxes where natural nest sites are lacking or absent and breeding density in young plantations can be increased.

Introduction

The kestrel is a small falcon that usually hunts by soaring and hovering almost motionless with head into the wind. Hunting from perches, particularly the tops of fence posts, telephone poles and trees occurs more frequently when there is little wind (Cramp and Simmons, 1980; Village, 1990).

Their main prey is the field vole which is often abundant in grassy habitats such as newly planted forests (Charles, 1981). Kestrels are opportunistic hunters able to exploit other prey species when field voles are scarce, including other rodents, large insects and a variety of small birds. In winter an adult kestrel needs to catch about three to four field voles a day or their equivalent biomass, whilst in the breeding season a male feeding a family needs at least twice this amount (Village, 1990).

In late winter and early spring much time is spent displaying to defend territories and in courtship. The male provides an increasing amount of food for the female as egg laying approaches. Kestrels make no nest but need some soft substrate in which to form a scrape where the eggs are laid. Nest sites include tree holes, cliff ledges, buildings and old stick nests. Eggs are usually laid at about 2-day intervals and usually number four to seven. In northern Britain laying starts in mid to late April in years when field voles are abundant. In poor vole years the start of laying is about 2 weeks later. Incubation is mainly by the female and lasts 27–29 days starting after the second or third egg has been laid. The eggs hatch over a 3–5 day period. The chicks are in the nest for about a month and continue to be fed by the parents for some time after fledging.

Kestrels are known to use nestboxes and artificial crow nests (Village, 1990). Nestboxes erected in the Dutch polders led to spectacular increases in density (Cave, 1968). In contrast, one study in upland conifer forests in Britain was unsuccessful (Petty, 1985) while another study did show that kestrels will breed in nestboxes and artificial crow nests (Village, 1990).

Aim of the study

Many newly-planted areas in upland forests develop a dense grassy vegetation in the 15–20 years before the tree canopy shades out the ground vegetation. These areas provide good habitat for field voles and productive hunting areas for kestrels. Planted areas are typically large at the afforestation phase and smaller and more dispersed when forests are felled and replanted (restocked). Second generation forests are being designed to provide a mosaic of different aged crops. This will result in hunting areas for kestrels always being available.

In much of upland Britain disused crow nests and crag ledges (Figure 1) are the nest sites most used by kestrels. Some areas lack both, so breeding kestrels may well be absent in otherwise suitable habitat. Therefore, the aim of the project was to investigate whether kestrels would breed in nestboxes in forests where natural nest sites were few or absent.

1. Kestrel nest with chicks on a small ledge on a crag. (*D.S. Whitaker*)

Study areas in north Scotland

The study areas comprised several Forestry Commission forests in Caithness, Sutherland and Ross-shire in north Scotland. Areas ranged from newly-planted sites to young plantations where the trees were 5–7 years old. Nestbox sites were between 10 m and 300 m above sea level in areas where the ground vegetation consists mainly of mixtures of heather, deer grass and purple moor grass.

Front cover. Male kestrel at nestbox with chicks, north Scotland. (*M. Canham*)

Nestbox siting and density

The siting of nestboxes was one of the most important factors affecting how quickly they were used for breeding. Kestrels like a good view from the nest area, so nestboxes should be positioned overlooking open areas particularly those suitable for hunting (Figure 2). Avoid siting nestboxes facing south (from SW to SE) unless they are well sheltered by branches from rain and the midday sun.

In newly afforested areas lacking large trees, nestboxes can be fixed to fence post extensions (Figure 3) or poles. Poles allow a wider choice of sites to be made. Choose a site on a knoll or small hill. If an isolated tree is present then position the box on this at any height above 3 m. When a plantation edge or shelterbelt of older trees is present, select a tree along the edge and fix the box to the upper third of the tree (Figure 4).

2. An ideal site for a kestrel nestbox, with a good view out over the surrounding country. (*M. Canham*)

Nestboxes should initially be spaced 1–1.5 km apart in areas where ample hunting habitat exists. If these are all occupied, then more nestboxes can be placed in between until saturation point is reached. When food is particularly abundant pairs of kestrels can breed within 200 m of each other. Several pairs may breed in a relatively small shelterbelt if surrounded by large areas of young plantations lacking natural nest sites. Kestrels often use nestboxes for roosting prior to nesting in them.

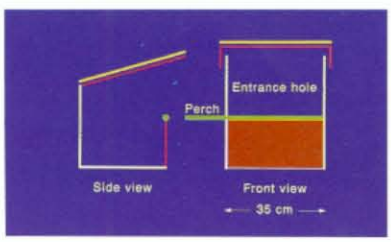
3. Kestrel nestbox fixed to a fence post extension. (*M. Canham*)

4. Kestrel nestbox sited on the edge of a plantation. (*M. Canham*)

Nestbox design and fixing

An open-fronted nestbox was used with the roof sloped to the back (Figure 5). The first nestboxes were made from 25 mm thick boards with felt covering the roof and back. More recently nestboxes were made from waterproof Sterling Board which overcame the need for roofing felt. Exterior grade plywood would be equally suitable. A perch made from 20 mm diameter dowel or branch was attached to the outside of the box extending out 300 mm from one side of the box.

Nestboxes were fixed to trees 3–10 m above the ground with 4 mm diameter nylon or polypropylene rope. The rope was threaded through holes drilled in the corners at the top and bottom of the nestbox and knotted on the inside. The other ends were tied around the back of the tree. This method allows the fixing rope to be slackened as the tree grows. Branches obstructing access to the nestbox were removed. Additional support is provided if a nestbox rests on a whorl of branches cut off approximately 200 mm from the trunk. Nestboxes on fence post extensions and poles were secured by nails or bolts at a height of 3–3.5 m.



5. Design of kestrel nestbox used in this study. The nestbox is built around an internal frame using 20 mm x 20 mm rough sawn timber (not shown in this Figure), approximately 2.5 m is required per nestbox. The rest is made from 10 mm thick exterior plywood or Sterling Board. Approximate dimensions are, side (x2) 35 x 25 x 30 cm, roof 45 x 37 cm, front 35 x 12 cm, back 25 x 33 cm, base 34 x 33 cm and the perch is made of 20 mm diameter dowel (or a branch) 65 cm long.

Results

This work has shown that kestrels will breed successfully in nestboxes where few or no natural nest sites exist (Table 1). In each of the last three years of the project (1988–1990) over 50% of the nestboxes were occupied, and over the last five years 285 young kestrels have been reared with an average brood size of 4.75 chicks per pair laying (Table 1). The occupancy rate of nestboxes sited on fence posts was not significantly different from nestboxes sited on trees (chi-squared = 0.56, df = 1, p = 0.46) (Table 2).

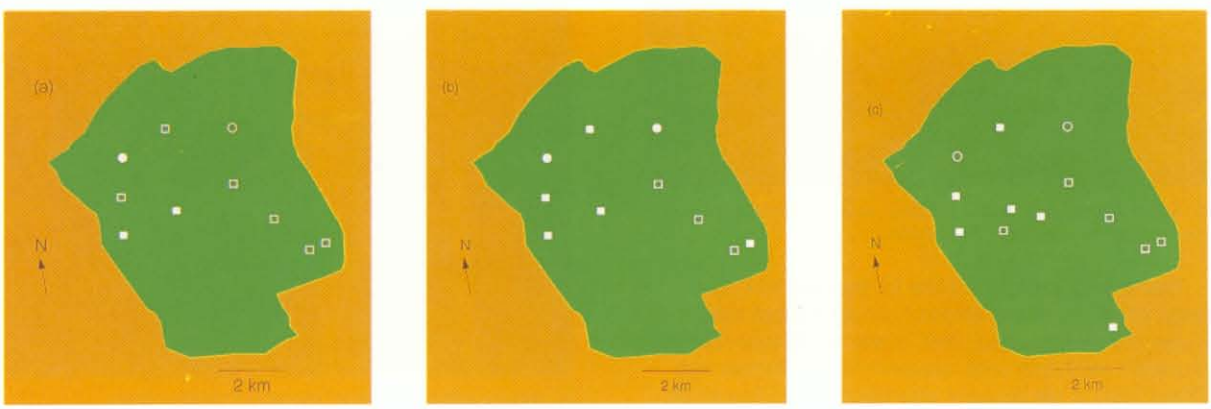
Table 1. Occupancy rates and brood sizes in kestrel nestboxes in north Scotland.

Year	Number of boxes		Chicks reared	
	available	occupied (%)	total	per box
1986	7	2 (28.6)	10	5.00
1987	24	7 (29.2)	33	4.71
1988	26	13 (50.0)	68	5.23
1989	33	18 (54.6)	90	5.00
1990	33	20 (60.6)	84	4.20
Total	123	60 (48.8)	285	4.75

Table 2. Comparison in occupancy rates between nestboxes sited on trees and fence post extensions.

Year	Fence posts		Trees	
	available	occupied (%)	available	occupied (%)
1986	0	0 (0)	5	2 (40.0)
1987	11	0 (0)	13	7 (53.8)
1988	14	3 (21.4)	12	10 (83.3)
1989	16	9 (56.3)	17	9 (52.9)
1990	16	12 (75.0)	17	8 (47.1)
Total	57	24 (42.1)	64	36 (56.3)

In one area at Benmore, Sutherland only two natural nest sites were known (Figure 6a). These were both small crags which had restricted the breeding population to just two pairs before 1987, prior to the erection of nestboxes. Once nestboxes (8–11) were available, the breeding pairs increased to 3, 7 and 6 over the next three years (Figure 6) corresponding to an increasing, peak and declining phase in field vole populations. Breeding was abandoned on the crag sites by 1989 suggesting that the nestboxes were more attractive. However, this may not have occurred if the crag sites had been of a better quality.



6. Map showing the breeding density of kestrels in Benmore, Sutherland in (a) 1987, (b) 1988 and (c) 1989. Circles show the location of natural crag sites, squares show nestboxes. Open symbols are unoccupied sites, filled (white) symbols show where breeding occurred.

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