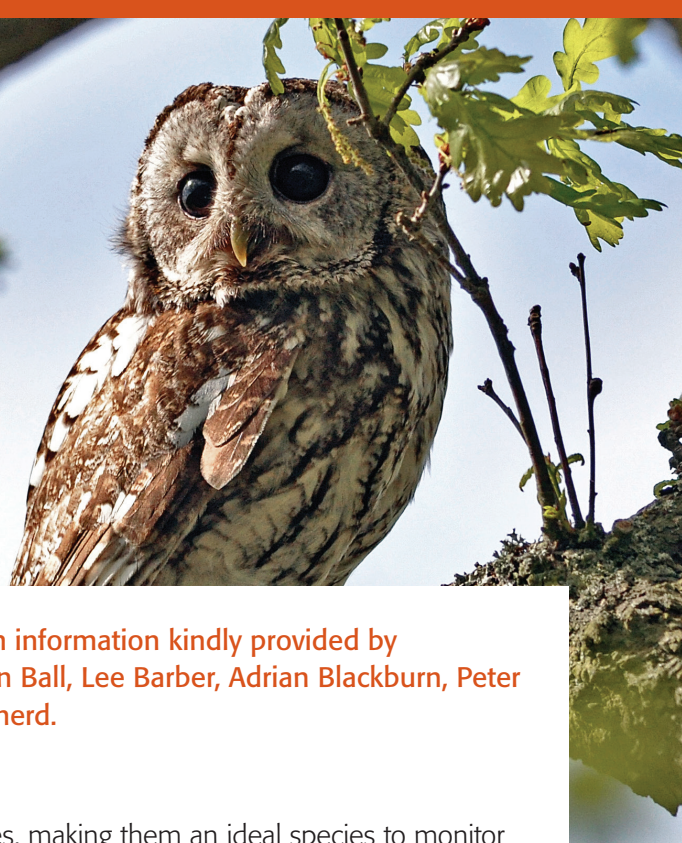


BEST PRACTICE GUIDANCE FOR RINGING AND NEST RECORDING TAWNY OWLS



The following best practice guidance has been compiled from information kindly provided by experienced fieldworkers Dave Anderson, Katy Anderson, Alan Ball, Lee Barber, Adrian Blackburn, Peter Johnson, Simon Lane, Jim Lennon, Brian Little and Bob Shepherd.

DESIGNING A PROJECT

Tawny Owls are cavity nesters that readily take to artificial nest sites, making them an ideal species to monitor using boxes. While they are, at heart, a woodland species, Tawny Owls will also breed in more built-up areas; whether they fare as well as birds in more natural habitats and whether this has changed over time is an interesting question and one for which more ringing and NRS data are needed in order to address.

As the density of owls is determined by food abundance, so too is the optimal placement of boxes. In good habitat, such as mature native woodland, boxes can be placed at c. 500 m intervals with up to four boxes erected per km square. Occupancy rates may be as high as 50%, with the more frequently occupied boxes often being those situated towards the outside of a wood. Poorer quality habitat, such as conifer forest, requires a lower density of boxes. If possible, avoid placing Tawny Owl boxes near traditional Sparrowhawk and Long-eared Owl nest sites to avoid competition; they should also be erected well away from busy roads to reduce the risk of owls being killed while hunting.

NEST BOX DESIGN

While an entrance hole diameter of 150 mm is standard, box designs vary greatly, from chimney style boxes angled at between 10 and 30 degrees from the horizontal to more traditional large hole boxes and even plastic barrels. Tawny Owls occasionally have to defend their boxes from squirrels, Stock Doves or other owls by jumping at the intruder; those in boxes angled more horizontally, are less likely to land on and damage the eggs than those in vertical boxes. Box designs for owls are available on the BTO website.

Tawny Owls will occasionally nest in Kestrel boxes, 'A-frame' boxes or 'tea-chest style' boxes designed for Barn Owls. Wooden boxes should be constructed from durable materials such as marine ply or larch and can be weather-proofed with roofing felt if placed at an exposed site. Some designs allow pulli to be accessed via the entrance hole, while others have doors built into the front or side. The deeper the box, the less chance there is of chicks leaving the nest prematurely.

Boxes can be fixed in place using a vertical wooden batten nailed to the tree (best to use aluminium or copper nails if in a commercial plantation). If nailing directly to a tree, hammering headless nails into place first and then hanging the box on them is much safer and easier than trying to hold a box and nail it to the tree simultaneously. They should always be placed facing a relatively open area that provides a clear flight path. In dense woodland, where boxes are not exposed to direct sunlight or prevailing winds, orientation is immaterial; at more exposed sites, orienting the box to the east or north-east is preferable. Boxes should be placed at least 2.5 m off the ground, and higher if security is an issue, but at a comfortable height for access without needing excessively long ladders. In areas where Pine Martens are present, predation can be reduced by wrapping the trunk of the tree below the box with thick plastic pond liner; the plastic must be at least 1 m in length and the tree must be isolated from others to prevent martens simply jumping across.

Ideally, nest boxes should be in place by late-summer / early-autumn as this gives birds the opportunity to find them long before nesting takes place. Occupancy will depend on demand so can occur quite quickly or may take some time (up to 11 years in one case). Tawny Owls don't build a nest structure and eggs laid on bare wood can become chilled and addled, or chipped. It is therefore important to add 5–10 cm of substrate in the bottom of the box in which females can make a scrape; wood shavings or needle litter from the forest floor are ideal, but fine sawdust should be avoided as this can damage eggs and chicks whilst hatching. Females will excavate the scrape in the autumn and this is a sign that a territorial female has 'claimed' a box; once it's occupied, male Tawny Owls will provision the female throughout the winter. Boxes should be cleaned after the chicks have fledged and the substrate checked for rings before being replaced.

PULLUS RINGING AND NEST RECORDING

Tawny Owls are generally quite synchronous within sites with respect to laying dates, but timing can differ between sites due to differences in food availability or weather. In years where food is abundant, Tawny Owls may start nesting as early as February, but in poor prey years breeding is likely to be delayed or even suspended altogether. The species is very sensitive to disturbance at the egg stage, so monitoring should be undertaken with caution before mid to late April, when most chicks should have hatched. NRS data show that clutch sizes can be recorded without influencing nest outcomes and the data are of value, but we strongly advise new recorders to seek best practice guidance from the BTO Nest Records Team or experienced recorders before monitoring begins.

On average, 2–3 eggs are laid, with incubation commencing from the first egg and lasting 28–30 days. There is a relatively large window of opportunity for ringing young Tawny Owls but 14–20 days old, when chicks will be big enough to take a ring but will not have left the nest, is an ideal age. As a rough guide, if a bird is still downy, with feathers still growing and weighs around 140 g, they are big enough to ring; wing length can be a useful indicator of age and should be recorded if possible. In natural sites, chicks leave the nest at less than a month old but they stay longer in boxes. If a single, large chick is found in a nest, it is worth checking the surrounding vegetation for siblings that may have 'branched' prior to fledging.

CATCHING ADULTS

There is a significant risk that female Tawny Owls will desert a clutch if caught on eggs, so adults should not be trapped during incubation or on chicks less than a week old; after this time, they can be caught safely. The female will remain with and brood the young for at least the first 10 days, and longer in poor weather. In contrast, the male rarely enters the box, electing instead to call the female off and pass food to her nearby.

Adults can be caught as they leave the cavity by placing a hand net (e.g. fisherman's landing net or small-mesh clap netting fixed to an angling-net frame and pole) in front of the entrance hole. Alternatively, a 'blocker' (a piece of foam attached to the end of a carbon-fibre pole) can be employed to prevent the bird leaving and it can then be caught by hand. The advantage of the blocker approach is that it enables the ringer to choose whether to lift the female off the nest or not. If the female is sitting tight when the nest is inspected, it is often possible to hear chicks squeaking or bill tapping, but beware that the latter sound is difficult to distinguish from the female bill snapping. Females should be returned to the box immediately after processing and the exit hole covered until they are settled, which generally takes just a couple of minutes.

Adults may occasionally be found roosting in nest boxes outside the breeding season so can be caught by hand or using hand nets when carrying out maintenance checks.

Away from the nest, audio lures can be used to catch full grown Tawny Owls year round, especially in the months before the breeding season. Large mesh nets of at least 30 mm, and preferably 45 mm, mesh size are needed to hold Tawny Owls effectively. Place nets along rides in woodland where the trees are dense. If there are very few trees, place the net out in the open at least 20 meters from any tree; if the net is placed by a large tree, there is a high chance that the owl will land and call from there instead of flying towards the net. Avoid wet and windy nights as Tawny Owls are less territorial at these times. Always ensure you have the appropriate endorsements in place to use audio lures, especially during the breeding season when luring should be limited to no more than 10 minutes in any territory per night.

AGEING AND SEXING TAWNY OWLS

There are characteristic differences between the flight feathers and primary coverts in adult and juvenile Tawny Owls. Juvenile primary and secondary feathers have a thin and broken terminal band; in adults this is thick and complete. Juvenile primary coverts usually show three dark bands, while adults typically only have two.

Tawny Owl moult is linked to breeding success, with non-breeding birds initiating moult earlier and carrying on for longer (e.g. from April/May to September/October); birds that have reared chicks replace relatively few feathers (Petty 1992, 1994). Adult birds will, therefore, typically show several generations of feathers within the wing and it is these that can be used to age the bird. Jeff Baker's revision of the *Identification of European Non-Passerines* guide provides more detailed information on ageing.

Female Tawny Owls are, on average, significantly larger than males in terms of both body weight and wing length. Using either of these measures in isolation can result in birds being sexed incorrectly because of the degree of overlap between the sexes, but the error is reduced if the two measures are used in combination. This approach, developed by Hardy et al. (1981) feeds the measures into the following formula:

$$D = 17.46 - (0.057 \times \text{wing length}) - (0.005 \times \text{body weight}).$$

If the value of D is greater than zero, then the bird can be classified as male, although one in 10 birds could still be misclassified. Another option may be to use the length of the hind claw (see below). If sexing on biometrics alone, please record the sexing method as 'S' in DemOn/IPMR.

HEALTH & SAFETY

It is advisable to have at least two people present when checking nest boxes, especially when using ladders. Flushed adult birds have been known to attack people, but this is far less likely to happen if there are multiple people present. Tawny Owls are more liable to attack at dusk, when they are more active, and when chicks are large. It is worth considering wearing goggles or safety glasses as well as head protection when checking potential nests.

NON-TARGET SPECIES

Stock Dove and Jackdaw are regularly encountered in Tawny Owl boxes, as are Kestrel, Barn Owl, Goosander and even Mandarin Duck. The latter sometimes wait until the Tawny Owls have fledged before taking up residence but occasionally will try to lay concurrently, which can cause Tawny Owl to desert. Other species encountered include Mallard, Goldeneye, Little Owl and numerous passerines. Perhaps less welcome are the Hornets, Pine Martens and squirrels.

ADDING TO OUR KNOWLEDGE

More information on the moult patterns of British Tawny Owls would be very useful, as would measurements of birds of known sex. Rantamäki and Aaltonen (2015), working on Scandinavian Tawny Owls, found the length of the hind toe claw to be a useful indicator of sex – the hind toe claw was less than 16 mm in males but greater than 16 mm in females (n=56), though note that Scandinavian Tawny Owls are larger than ours. Claw length has also proved useful in other *Strix* species, so there is an opportunity for British researchers to develop this approach here.

Another approach that might prove valuable is the use of UV light to identify wing moult. UV light causes porphyrin pigments in the feathers to fluoresce, aiding separation of feathers belonging to different generations. Since UV light can be damaging to the eyes of both owls and researchers, the owl's eyes should be shielded and you should also use suitable protection, e.g. UV blocking glasses.

There is currently only one active Tawny Owl RAS project; since the early 1990s, annual Nest Record Scheme totals have held steady at between 350 and 500. Aside from additional RAS projects, we would especially encourage studies to try to gather more detailed Nest Record information, especially for the calculation of laying dates, clutch size and fledging success, though as stated previously, gathering data for the two options must be done with care. Recording information on prey items and nests including the use of natural cavities in addition to nest boxes may also be useful.

Ringing and retrapping more adults, both at the nest and more generally would greatly enhance our knowledge, especially for males which are typically under sampled. It may also enhance our knowledge of juvenile dispersal and recruitment into the breeding population which may be a key part of their apparent recent population decline. Given the risk of disturbance the use of PIT tags fitted to both adults and puli within a study may offer a way of easing the collection of these data on fledged birds of both sexes though it does require an initial large cost to start the study.

We are very grateful for all the work that goes into collecting the data and maintaining the box networks and would be happy to chat to anyone interested in converting their existing project into a RAS or starting/expanding a ringing or nest recording project.

FURTHER READING

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Tawny Owl *Strix aluco*

Clutch size: 2–3 eggs

Incubation: 28–30 days

Chicks fledge at: 32–37 days

Broods: 1 per year

Seasonality of nests with eggs (E) and young (y), derived from Nest Record Scheme data.

