BEST PRACTICE GUIDANCE FOR RINGING AND NEST RECORDING BARN OWLS

The following best practice guidance has been compiled from information kindly provided by experienced fieldworkers Alan Ball, Allan Hale, Roger Juckes, Bob Shepherd, Geoff Sheppard, Jean Sheppard, Peter Wilkinson and Bernard Wright.

DESIGNING A PROJECT

Barn Owls are cavity nesters that will breed in buildings, natural cavities in trees, amongst bale stacks and so on, but will also readily take to artificial nest sites, making them an ideal species to monitor using boxes. Barn Owls are not particularly fussy about where they breed, but do require a relatively large cavity due to the potential size of their broods. Barn Owl is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). A Schedule 1 licence must be in place for the project lead and any accredited agents before commencing breeding season monitoring.

Barn Owl density is habitat dependent; in good areas (for example, wildlife corridors, stream valleys, rough pasture, unimproved grassland and so on) and good prey years, multiple boxes sited within a few hundred metres of each other may all be occupied, whereas in poorer habitat, boxes may need to be positioned 500 m apart. Occupancy rates will also vary depending on the year and the amount of available prey. Where possible, pair boxes close together (these can be very close) both to allow the male (or the pair) to roost away from the nest and to provide an alternative site to other species that may otherwise try to evict Barn Owl from a box. Alternatively, double-decker boxes can be used.

A project of any size has some value but the size of the project has to be commensurate with the situation of the person/people conducting it; a retired person may have more time than someone in full time employment for instance. For health and safety reasons (and to share the burden of carrying all the equipment), it is advisable to have at least two people present when checking owl boxes, especially when using ladders. It is more valuable, in terms of the data gathered, to carry out more visits to fewer boxes and to gather nest recording information, than to have so many boxes that only a single visit can be undertaken each year.

If registering the project as a RAS, this requires a minimum number of adults to be caught (enough to produce 30 retraps a year), so this factor this has to be considered. It is hard to estimate in advance the percentage occupancy and therefore the number of adults likely to be caught. One contributor noted that their retrap rate at regular boxes was normally well over 50% for females, but only 25% for males as fewer males are caught. A scheme with around 50 regularly-occupied boxes would probably produce the 30+ retraps needed for a RAS; however, fewer occupied boxes may be required if a greater effort is made to catch both adults.

Farmers are usually very cooperative if approached regarding siting a box on their land and are often keen to be present when the chicks are ringed. One potential issue with indoor boxes is that a farm building or cottage may be sealed up, renovated or demolished without warning and good boxes and sites can be lost in this way.

NEST BOX DESIGN

Barn Owls will readily take to most nest boxes including double-decker boxes, A-frame boxes, tea-chest style boxes, plastic tubing or even re-purposed rabbit hutches! The design of the box chosen may differ depending on whether it is being placed indoors or outdoors. Regardless of the design, the lighter the box, the easier it is to erect! Be aware that not all commercially available Barn Owl boxes are fit for purpose, with some failing to include access hatches and some being either too small or with not enough depth between the box base and

the entrance/exit hole. The lack of depth enables the chicks to exit the box early (before they can fly) and many will fall and die even with an exercise platform or tray present. It is good practice to ensure a minimum depth of 300 mm from the bottom of the entrance hole to the base of the box.

If Barn Owls are found nesting in difficult to access cavities, or birds are seen in an area without a box, locating a box nearby will usually encourage them to transfer to, or use, the box.

NEST BOX PLACEMENT

Boxes can be put up in most months of the year, but late autumn or early winter is ideal to attract young birds that are dispersing prior to the next year's breeding season and give them time to settle. Some new boxes are used immediately, while others may take several years to be occupied. Boxes can be placed as low as 2 m from the ground but 3–4 m is more common; lower siting makes for easier access and trapping of adults. If adults are to be trapped, clear access to the front entrance is important.

Indoor boxes are easily and cheaply made from 10 mm board and can be put up in buildings with open rafters (put them through the rafters and then turn 90 degrees), on suitable ledges or in loft spaces. Internal boxes can also be fixed to beams or wall plates/rails (either timber or steel). Timber battens can be used to secure boxes to wooden beams while stout cable ties can assist in fixing to metal plates/rails.

Outdoor boxes can be positioned on trees with two suitable branches at similar levels projecting out at an angle so that the box can 'sit' on them (with help from extra pieces of wood if necessary, to create a level base) and then be secured by a screw through the back of the box into the tree. Timber wedges may be needed at the rear of the box to stabilise it. Alternatively, A-frame boxes can typically be mounted straight on to wide, straight sections of tree trunk. Metal fixings in trees can leave a long-term hazard for arboricultural chain saw use, so using plastic / nylon bolts with nuts, wooden screws or softer metal nails (aluminium or copper for example) is advisable, particularly in commercial plantations. A rope support can be used as an additional safety measure while lifting the box into position. Boxes can also be sited on 'telegraph' poles which have been sunk almost a meter into the ground using a motor driven augur. A minimum team of four people is needed to erect the pole; the box should have been attached to the pole using metal brackets before placement.

Tree-mounted boxes should ideally be placed on isolated trees with a clear flight line to the entrance – generally, the more obvious the better. Boxes placed adjacent to woodland or in heavily treed hedgerows are more likely to be used by squirrels than owls. The position of the box is not that important, providing it is not located facing the direction of the prevailing weather. Be aware that the ownership of trees on some farm boundaries may be difficult to ascertain.

Barn Owls will not lay eggs on to bare wood or plastic, so the bottom of the box should be covered with a good layer of (untreated) wood shavings, bark chippings or potting compost. This should be deep enough to enable the birds to form a scrape to lay their eggs. Fine sawdust should be avoided as this can damage eggs and chicks whilst hatching.

It is advisable to avoid erecting boxes within 1 km of motorways, other major roads or busy railway lines, all of which are a cause of owl mortality.

CLEANING AND MAINTENANCE

Barn Owl boxes are likely to need cleaning out annually, although the build-up of pellets at the bottom of a nest box depends on the situation of the box and the length of time the adults spend in it. At sites where there are limited external roosting places, nest boxes will need to be cleaned more often. The pellets can consolidate into quite a hard mass and a small garden hand rake is ideal to break this up for easier removal. Nest box designs featuring a removable lid can also greatly ease the cleaning process, though they must be well secured to prevent accidental loss or damage.

Under the Wildlife & Countryside Act 1981 (as amended), it is only legal to clean out nest boxes between 1 September and 31 January, but be aware that Barn Owls with second broods may be using the boxes into October or November and cleaning should not take place until the birds have fledged.

Maintenance of nest boxes is an ongoing task, usually undertaken at the same time as cleaning. Indoor boxes may need little maintenance but fastenings on outdoor boxes are particularly vulnerable to deterioration. Spare nails, hammer, fastenings and so on should be carried on maintenance visits.

PULLUS RINGING AND NEST RECORDING

Timing of Barn Owl breeding depends on the geographic area, the weather and the vole density, which can vary from year to year; in a good prey season, Barn Owls can start their first clutch from early March. Typically, if Barn Owls have eggs by mid-April there is a good chance they will produce a second brood if conditions allow. In an average year, second clutches (or first broods of birds born late in the previous season) will be laid in early August, with chicks present in September and fledging occurring in October (fledging can occur in November in a late season). The female moult strategy may also provide an in indicator of whether a second brood will be attempted; if primary moult hasn't begun whilst the bird is brooding the first clutch, there is a good chance the female will breed again. For nest recording purposes, many recorders will start nest visits in April. A minimum of two visits a season is required to ensure box occupancy is known, but additional visits will be required to produce a full nest record and to ring the chicks.

Unlike Tawny Owls, Barn Owls are generally quite tolerant of disturbance if on eggs or partly grown pulli; however, if an adult is found to be sitting on hatching eggs or very small chicks, it is best to close the box, back off and reschedule the visit for a time when pulli can be ringed. This prevents any risk of desertion or accidental damage to the eggs or chicks. If the bird moves off her clutch of her own accord, a brood count can safely be made. It has been reported that Barn Owls can be sensitive to desertion at the courtship period, so early nest visits should be undertaken with care. If the occupancy of the box is unknown, or the stage of the breeding cycle is uncertain, it is advisable to block the entrance hole, or use a net to catch the adult(s), to prevent them from leaving the box. Adults are not generally present when chicks are over 25 days old therefore disturbance is normally not a problem at this stage.

On average, Barn Owls lay 3–6 eggs, with incubation commencing from the first egg and lasting 30–34 days. Chicks will take rings from around three weeks old when still 'In Pin'; however, waiting until the primary feathers on the youngest bird are starting to unfurl (P7 = 25 mm) is ideal. Ringing when the chicks are over c. 30 days old will enable more individuals to be sexed; however chicks should all be ringed before the oldest bird reaches 50 days to reduce the risk of individuals fledging prematurely. Chicks should be able to fly at 55–60 days old.

CATCHING ADULTS

Adult birds can be caught at nest boxes quite easily year round, either by using a hand net (e.g. fisherman's landing net or small-mesh clap netting fixed to an angling-net frame and pole) or by blocking the entrance to the box with a 'blocker' (a piece of foam attached to the end of a carbon-fibre pole) and removing the adults by hand. Blocking the box entrance provides the choice of catching adults from the box by hand or leaving them undisturbed, depending on box contents.

It is much easier, and safer, to work in a pair or group when catching adults at the nest, particularly if using a hand net. With adult Barn Owls, there is a good chance that both birds could be in the box and working in pairs enables one person to hold the net, even after one adult emerges, whilst the other person checks the box to see if a second bird is present before removing the net. If working alone, if both adults are in the nest only one will normally be caught with the second (normally the female) flying away when the net is lowered. Some adult Barn Owls will be disturbed by the slightest sound or movement so may flush before the box is reached, while others are astonishingly 'laid back'. Attaching a string to the netting of the hand net allows the net to be held out fairly horizontally when in front of the entrance hole. Some adults are disturbed simply by the sound of the net going over the box, fly out and are trapped in the net; if the net is not held out the bird can encounter the net and retreat back into the box where it can be caught by hand.

Regardless of the method employed, the approach to the nest site should be made quietly by one member of the team who either uses a 'blocker' or places a hand net in front of the entrance hole. Once another team member has climbed up to the nest, the entrance hole can be blocked manually with sacking, a towel or similar and entry can be made via the inspection hatch. Adult Barn Owls should be handled as carefully and calmly as possible, so that they can be returned to the nest box in as relaxed a state as possible to minimise the time it takes them to settle. If using a blocker, one person should keep this in position whilst the rest of the team withdraws; noise and disturbance in the vicinity of the box should be avoided during this period.

A small but powerful torch is useful, both for looking into boxes from the front or trying to locate an adult in the box when attempting to hand lift. A tube of antiseptic cream is also a useful piece of kit; Barn Owl talons are not always as clean as they might be!

AGEING AND SEXING BARN OWLS

Ageing of adult Barn Owls is done using the pattern of moult in the primary feathers. This is well documented in various books e.g. Jeff Baker's *Identification of European Non-Passerines*. One contributor noted that they found it easier to age feathers from the moult pattern when viewed from underneath the feathers than above. A UV light on the ventral surface of the wing can also help to differentiate between new and older feathers. 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.

Development of the talon flange on the second forward-facing toe can also assist in ageing Barn Owls in young birds, although one contributor found that this feature was only helpful for identifying juveniles in their first winter. Nestling birds can be aged to within a day or so on the length of the P7 feather pin and emerging feather (Baker 2016), a feature that appears to be independent of body condition (weight).

Sexing is also well documented, with male underparts generally uniform white and female underparts generally heavily speckled with black, grey or brown flecks. The flecking becomes apparent in females, or is absent from males, from approximately 30 days old, enabling many chicks to be aged when ringed. There are always exceptions to the rule however, and quite spotty males and almost pure white females are possible.

NON-TARGET SPECIES

Jackdaw, Feral Pigeon, Stock Dove, Tawny Owl, Little Owl, Kestrel, Mallard and Mandarin Duck are common species that will occupy a Barn Owl box, along with squirrels, Hornets, bees and wasps. One contributor reported that at least 24 species had used their nest boxes! Jackdaws regularly fill a box with a large number of sticks to form their nest; boxes with a 'landing platform' at the entrance tend to be favoured by Jackdaws as they can perch while feeding their sticks into the box. Barn Owls are quite tolerant of pigeons which do not prevent the Owls from using the box. Occasionally, both Barn Owls and pigeons nest successfully in the same box though the pigeon pulli are potential food if vole numbers fall!

In Lincolnshire, two females have been encountered nesting together in the same box with one male. It is therefore worth bearing this in mind if having difficulty sexing adults, as two birds in one box does not always equal a male and a female.

ADDING TO OUR KNOWLEDGE

There are currently five active Barn Owl RAS projects and Barn Owl is consistently in the list of top 10 species by number of nest records received each year. One RAS project is currently trialling the use of PIT tags to increase the number of re-encounters. 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 or expanding a ringing or nest recording project. Areas of practical interest, in addition to RAS and more complete nest recording to gather more information on laying dates, clutch size and fledging success, include increased biometric samples of adults and more checking for second broods.

FURTHER READING

Baker, J. (2016) *Identification of European Non-Passerines.* British Trust for Ornithology, Thetford.

Taylor, I.R. (1993) Age and sex determination of Barn Owls *Tyto alba alba*. *Ringing & Migration* **14** 94–102

Weidensaul, C.S., Colvin, B.A., Brinker, D.F. & Huy, J.S. (2011) Use of Ultraviolet Light as an Aid in Age Classification of Owls. *The Wilson Journal of Ornithology* **123**,373–377.

Barn Owl *Tyto alba*

Clutch size: 4–6 eggs

Incubation: 32 days

Chicks fledge at: 53–61 days

Broods: 1–2 per year

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

Cover photograph: Les Foster / BTO