An estimate of the breeding population of Barn Owls *Tyto alba* in Shropshire 2002

A report by the Shropshire Barn Owl Group

1. Introduction

A national survey of breeding barn owls *Tyto alba* in 1932 (Baker, 1932) estimated the population at 12000 pairs, Shropshire supporting 287 pairs. The national population had declined to 4000 pairs by 1987 (Toms, 1999) whilst ithe Shropshire population has been variably estimated at 95 pairs in 1985 (Shawyer, 1998), 140 in 1992 based on fieldwork between 1985 and 1990 (Deans et al 1992) and currently 70 pairs (Hawk & Owl Trust 2002). The decline has mainly been attributed to a drastic reduction in prey-rich foraging habitat and the destruction of traditional nest sites (Cayford 1992). The indications are that the national decline may have halted (Mead 2000) but the barn owl remains vulnerable (Gregory et al 2000).

The Shropshire Barn Owl Group (SBOG) was formed in 2002 with the aim of providing nestboxes for barn owls and promoting the conservation of their habitat in Shropshire. Where nestboxes are placed in areas of suitable habitat but with few potential nesting sites, the number of nesting pairs can be increased significantly (Taylor 1994). Conversely, in a study of breeding barn owls in relation to barns and barn conversions in Devon, a 'knock-on' effect was discovered whereby the loss of an occupied barn, usually the breeding site, through conversion or decay resulted in abandonment of the barn and also other nearby roosting sites within the 1.5. kilometre survey area of the barn (Ramsden 1995).

In order to measure the effectiveness of the provision of nestboxes and to assist their targeting, a contemporary baseline breeding population figure was considered essential. It was envisaged that an analysis of existing barn owl site records might identify adjacent and similar sites that should be investigated for additional breeding pairs. The present analysis was confined to all random Shropshire Ornithological Society (SOS) records from the period 1993 to 2002 and SBOG records for 2002.

2. Defining a barn owl pair

A site was counted as supporting a breeding pair where at least one barn owl was recorded in the months February to August in any one year. Research in the UK indicates that adult barn owls are sedentary, pairs are generally established by February, when territorial activity begins, and courtship commences in February or March (Taylor 1994, Shawyer 1998). Once established at a site barn owls are highly faithful to it (Taylor 1992). Observations of birds between the months of February and August on regularly occupied sites are therefore most likely to relate to members of a pair.

It is equally possible that some records of single barn owls during the breeding season related to unmated birds. However, since some of these sites were relatively secluded, second birds could easily have gone unnoticed by observers. Barn owls can be extremely elusive and can occupy a site without being noticed by the landowner (Bunn 1982). The female also spends much time on the nest in the early stages of breeding (Taylor 1994) and therefore the opportunity of observing two birds at any one time is initially limited.

August marks the end of the breeding cycle, when most birds will have fledged, although, young from second broods can fledge as late as November. Juveniles generally begin dispersing form their natal site in September and several sites in Shropshire regularly supported birds during the non-breeding period but not subsequently in the breeding period. This supports the assumption that observations of single birds during the winter probably

relate to unmated juveniles, dispersing from their natal site and settling on wintering grounds, rather than members of a pair. Juvenile barn owls complete their dispersal phase within about three months of fledging (Taylor 1994) but some do not settle on their future breeding site until February or March (Shawyer 1998). For these reasons, observations of barn owls between the months September to January are not recorded as members of a possible breeding pair unless there is direct evidence to the contrary, such as two birds roosting together in a nestbox.

3. An analysis of records 1993 to 2002

All SOS barn owl records for the years 1993 to 2002 were analysed. Confining the analysis to records of barn owls since 1993 was an arbitrary decision based on the assumption that records prior to 1993 might not now be reliable due to potential changes in habitat and loss of nest sites and could suggest the existence of pairs that in reality no longer occupy a site.

Although the average life expectancy of a one year old barn owl is around three years and their lifespan is relatively short for a bird of prey (Shawyer 1998), male and female barn owls have a site fidelity of 99.29% and 95.1 % respectively (Taylor 1994). In addition, of 137 male and 150 female barn owls studied over a period of 13 years, movements were all less than 8 kilometres and in all but one case were to an adjacent nest site on the death of a partner (Taylor 1994). These factors therefore point to continuous and long-term occupation of sites where environmental conditions permit.

Referring to SBOG's data of known breeding pairs in 2002 based on a programme of site survey, nestbox provision and monitoring and liaison with landowners, an additional 11 breeding pairs were identified around Oswestry, Ellesmere, Market Drayton and the Weald Moors, north of Telford. The SBOG eliminated three SOS sites which recent fieldwork by the group confirmed did not currently support breeding barn owls.

The resultant SOS and SBOG breeding pairs were entered on OS maps using the available grid references. Barn owls occupy ranges of around three square kilometres (Cayford 1992) and hunt mainly within one kilometre of their nest site (Taylor 1994). Pairs plotted in adjacent one-kilometre squares were counted as one breeding pair. The exception to this rule was where the density of habitat features such as the confluence of waterways or the presence of several farms with associated outbuildings suggested that two pairs of barn owl might be co-existing in close proximity to each other.

4. The final count for 2002

The final process of eliminating some probable duplicate pairs produced a population estimate of 121 breeding pairs in 2002. Of these, 110 pairs were identified from SOS records and 11 from SBOG's site surveys and nestbox monitoring largely in north Shropshire. If we assume that SBOG has been active in approximately 40% of lowland Shropshire so far (but that by no means has every hectare and nook-and-crannie been surveyed) and that that similar results were replicated in the relatively unsurveyed 60% of lowland Shropshire south of Shrewsbury and Telford, around Bridgnorth and in south Shropshire, an additional 16 unrecorded pairs might be present. This would provide a breeding barn owl population estimate of 137 pairs.

The obvious question is how reliable is this estimate? 76 % of the 121 pairs are based on site records of barn owls during the breeding season March to August within the last five years. 51 (42.0%) of the pairs are based on one breeding season record of a barn owl in the respective site in any one of the ten years 1993 to 2002, 35 (29.0%) pairs on records of a barn owl recorded on two or more separate occasions and the remaining 35 (29.0%) pairs relate to confirmed breeding or to two birds recorded simultaneously and therefore probably a pair.

A word of caution. Although barn owls occupy relatively small breeding ranges and can be strongly defensive of their immediate nest site, they do not defend exclusive feeding territories (Shawyer 1998). Consequently, feeding ranges can overlap and members of several pairs might be present in any one good feeding area. It is therefore feasible that the process of elimination of records of birds in some abutting squares might have eliminated actual breeding pairs and that the breeding population could be understated. However, the preponderance of records of single birds rather than of several birds in close proximity suggests that the likelihood of this error is low.

There was some evidence of sites vacated by barn owls but equally there was some evidence of recently occupied sites. This may be partially due to changes in observer coverage as much as specific changes in the sites. Barn owls require around 4 hectares (10 acres) of rank or rough grassland, supporting good supplies of small mammal prey, especially short-tailed field voles (Shawyer 1998). Grassland with a thick sward and deep litter layer provides the best habitat and on farmland this is now largely confined to linear features such as hedgerows, headlands, drainage ditches, fence lines and woodland edge, but elsewhere a miscellany of semi-managed or unmanaged rough grassland along riverbanks, road verges and railway embankments (Cayford 1992). The SBOG has tentative evidence in Shropshire that the creation of grassy headlands on arable farms and lightly grazed pasture on livestock farms under Arable Options and Countryside Stewardship schemes is providing prey-rich habitat and new opportunities for the barn owl and is attracting birds to previously unoccupied sites.

5. Beyond the car headlights.

A quick glance at the dots of barn owl pairs on the OS maps and you could be forgiven for assuming that the barn owl's life revolves around the network of A and B roads disseminating from the major county towns. The dots along main roads such as the A49, A442 and A5 out of Shrewsbury and Telford are particularly striking. Does this tend to reflect the behaviour of motorists spotting barn owls in their headlights rather than a strong association of barn owls with road verges?

Some of the observations along roads will relate to traffic casualties, but the SOS annual report for 2001 referred to only one such incident. Whilst a number of roads no doubt support good rank grassland verges, the dearth of observations across the intervening farmland and in sparsely populated areas of the northwest and west of the county suggest the apparent distribution of barn owls reflects a random observer coverage which is biased towards the densely populated areas and main roads. So, although all sightings of barn owl are important in building up a picture of their distribution and numbers, there is a need to check for barn owls in the more secluded and inaccessible parts in the north of the county. There was only one pair recorded in Oswestry with none in the surrounding area for a radius of around 6 kilometres. Do barn owls, for instance, breed around Melverely and Alderbury or around Childs Ercall in the northeast?

6. The 'unexplored' south

It is generally assumed that barn owls avoid land above 300 metres (Shawyer 1998) but the Montgomeryshire Barn Owl Group discovered that barn owls will breed above the 300 metre contour where nestboxes are provided on poles (Formaggia, 2001). Barn owls were present in the immediate vicinity of high ground of the Long Mynd at Church Stretton, All Stretton and Cardington. The remainder occupied the intermediate river valleys. Perhaps then, the limiting factor in the Shropshire uplands is the absence of suitable nest sites and not the lack of feeding habitat.

Whilst most of the definitive river valleys supported breeding pairs, there were large tracts of land, well away from roads and villages, that had no evidence of breeding barn owls. For example, the was no evidence of occupied breeding sites in southwest Shropshire around

the Clun Forest and Knighton and in a large triangle from Corve Dale, between Much Wenlock and Ludlow, east through Clee St Margaret, Brown Clee Hills and Ditton Priors to Bridgnorth. Even though much of the land east of Corve Dale is intensive farmland, surely a number of barn owls breed there.

7. Should we be more open about barn owls?

Historically, there has been a tendency for landowners to keep records of 'their' barn owls secret. Perhaps this has been partly due to its population decline, its perceived vulnerability to egg collectors, and its elusive and secretive nature, all of which have served to create a protective response by landowners and birdwatchers in general to barn owls.

Whilst records submitted to the SOS should remain strictly confidential where the observers specifies and data protection insists, the Barn Owl Trust reports of incidents where barn owls have been lost from sites because conservationists were unaware of their presence and consequently were unable to take action to protect the breeding site (Barn Owl Trust 2003).

The barn owl is not particularly rare or under threat from egg- collectors and in any case, most barn owls nest on private and relatively secluded land. Perhaps it is time to be more open about the presence of barn owls and to make conservation bodies aware of them in order that they can openly discuss barn owl sites and take measures to protect their sites and better understand their population dynamics and habitat requirements.

8. The future

In conclusion, the SOS records for 1993 to 2002 with adjustments for losses and gains from the SBOG's data and potential unrecorded pairs in unsurveyed areas estimates the breeding barn owl population for Shropshire to be in the region of 121 to 137 pairs. Comparing the current population with the Atlas estimate of 140 pairs suggests that the barn owl breeding population in Shropshire continued to decline through the 1990's but that the Hawk and Owl Trust estimate of 70 pairs in 2002 is too low.

Are there alternative ways of obtaining a population estimate? One possibility is a countywide survey. However, a survey of barn owls in Devon found that it was time consuming and even with extensive support from fieldworkers and landowners, only a proportion of the county could be checked (Grant 1993). The survey also found that it was not possible to check every 'nook-and-cranny' in every sample site. Estimating the barn owl breeding population of Shropshire using the present process is probably the most appropriate option for now and it provides an estimate which can be 'fine-tuned' and modified each year as new data comes in.

Unless some of the older sites are re-visited to verify the continued presence of barn owls there is a risk that the database will become increasingly unreliable. The SBOG hopes to have the opportunity to visit some old sites during the course of survey work and the programme of nestbox installation, but it would be of immense value if SOS members could make a determined attempt to check for evidence of barn owls. Just one evening site visit producing one sighting of a barn owl during the breeding period March to August would be enough to indicate the possibility of breeding and to help keep site records up to date.

This analysis clearly indicates that gaps across the county remain where suitable habitat appears to exist and barn owls are unrecorded. The challenge is there: - to search suitable habitat in isolated areas, away from main roads and centres of population, and especially in south Shropshire. The discovery of a new pair of barn owls awaits!

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