



1993 Barn Owl Survey of Devon

A joint project by the Barn Owl Trust
and the Devon Bird Watching and Preservation Society



by
KEITH GRANT, GEOFF PEARCE and DAVID RAMSDEN



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Introduction:

During the first half of the 20th Century, the Barn Owl was apparently very common in Devon. Anecdotal information from elderly farmers in the county suggests that the bird was once a common resident on most farms. A national Barn Owl survey in 1932 estimated the Devon population to be in the region of 712 pairs (Blaker 1934). There is a consensus of opinion that numbers have fallen as a result of a dramatic reduction in food availability, caused by changes in agricultural practices such as the loss of rough grassland and hedgerows (Cayford 1992, Taylor 1994). Other possible causes of decline include the loss of old barns and hollow trees, use of modern rodenticides and an increase in road mortality.

A national Barn Owl survey in 1983-85, conducted by the Hawk Trust, estimated the Devon population to be in the region of 235 pairs (Shawyer 1987); and S G Madge in the Tetrad Atlas estimated possibly as many as 800-1,000 pairs in 1977 had declined to perhaps less than 300 by 1985 (Sitters 1988). However, Percival (1992) states that, on a national scale, *'there is no satisfactory quantitative information available to identify how large the decline has been and whether it is still continuing'*. No county-based Barn Owl survey of Devon has previously been published.

The New Atlas of Breeding Birds in Britain and Ireland (Gibbons *et al* 1993) contains the most recent published information available and suggested that the Barn Owl was widely distributed within the county during the period 1989-1991.

Aims:

During 1993, the BOT and the DBWPS jointly organised a Barn Owl survey of the county of Devon. The aims of this survey were:

- a) to establish the number and distribution of known sites where breeding or roosting occurred during 1993,
- b) to recheck Barn Owl sites found by the 1983 DBWPS Survey, collated by M Davies (unpublished), and to analyse any trends,
- c) to analyse the types of breeding and roosting sites used.

Methods:

Rather than intensively searching sample areas, our methods relied very heavily on existing random site records held by both the BOT and DBWPS, together with publicity for the survey and requests for information circulated widely through the media and the literature of the various conservation bodies in the county. The survey cards (see Appendix A) requested as much detailed information as possible including exact grid references of the location, the owner or tenant's name if known, evidence of breeding or roosting, when the birds were last seen, a description of the site and its surrounding habitat and an indication if the site was under threat of destruction, conversion or undue disturbance. The survey only required information on breeding or roosting sites; we did not follow up or record lone sightings of individual birds. We were mindful of the Wildlife and Countryside Act 1981 and the fact that the Barn Owl was (and is) on Schedule One. Advice to field workers was given and instructions that, if they did not hold a Schedule One licence, they withdrew from any building or hollow tree as soon as any evidence of breeding Barn Owls was found (see Appendix B). The survey covered the whole year, and evidence of breeding didn't necessarily require eggs or young to be seen. Adults ferrying food back to the nest site and the characteristic food-begging call of young birds can both be used as indicators of breeding without actually inspecting the nesting place. Talking to the farmer or land-owner often provided information, and finding a used nesting scrape with broken egg shells or lots of chick down also provided evidence after the breeding season. Thus, not all accepted records were confirmed by an experienced field worker.

To prevent sites being visited by more than one person and due to possible conflicts over confidentiality at some sites, the county was divided into 5 km squares and, where possible, assigned to a particular field worker. Various members of DBWPS volunteered (or were coerced!) to check historic sites known to them and also to take on whole 5 km squares to 'cold search' for further sites. The Barn Owl Trust reviewed their considerable historic data, built up over the last ten years, and undertook to recheck as many site records as possible. Information from this and other sources concerning a particular square was then passed to that field worker as required.

Requests for survey cards from members of the public were serviced by the BOT, who also received information directly by telephone. Completed survey cards were received by both GP (for DBWPS) and the BOT.

At the end of 1993, both GP and DJR had amassed their own separate sets of survey cards. Location information on those cards pertaining to sites confidential within each organisation was then removed prior to both sets being merged to form the completed joint data. A 5 km square reference and a contact name was of course retained so that the original data could be traced if required. During this merging process, any possible duplications were checked and removed as necessary.

Coverage:

Figure 1 shows those 5 km squares assigned to volunteer field workers who expressed an interest in visiting farms, normally in their own home area. Thus the allocation of squares was not strictly random. Also, the amount of fieldwork actually undertaken within these

squares varied tremendously according to the individuals' enthusiasm and available time. The entire range was represented from just one or two visits to likely looking farms and interviews with farmers, to squares where every farm was visited, all farmers interviewed (where possible) and 'leads' followed up by searches where necessary. Thorough intensive searches of every potential 'nook and cranny' (where a Barn Owl could possibly roost) within a 5 km square (which is necessary to prove absence) were not undertaken as part of this survey.

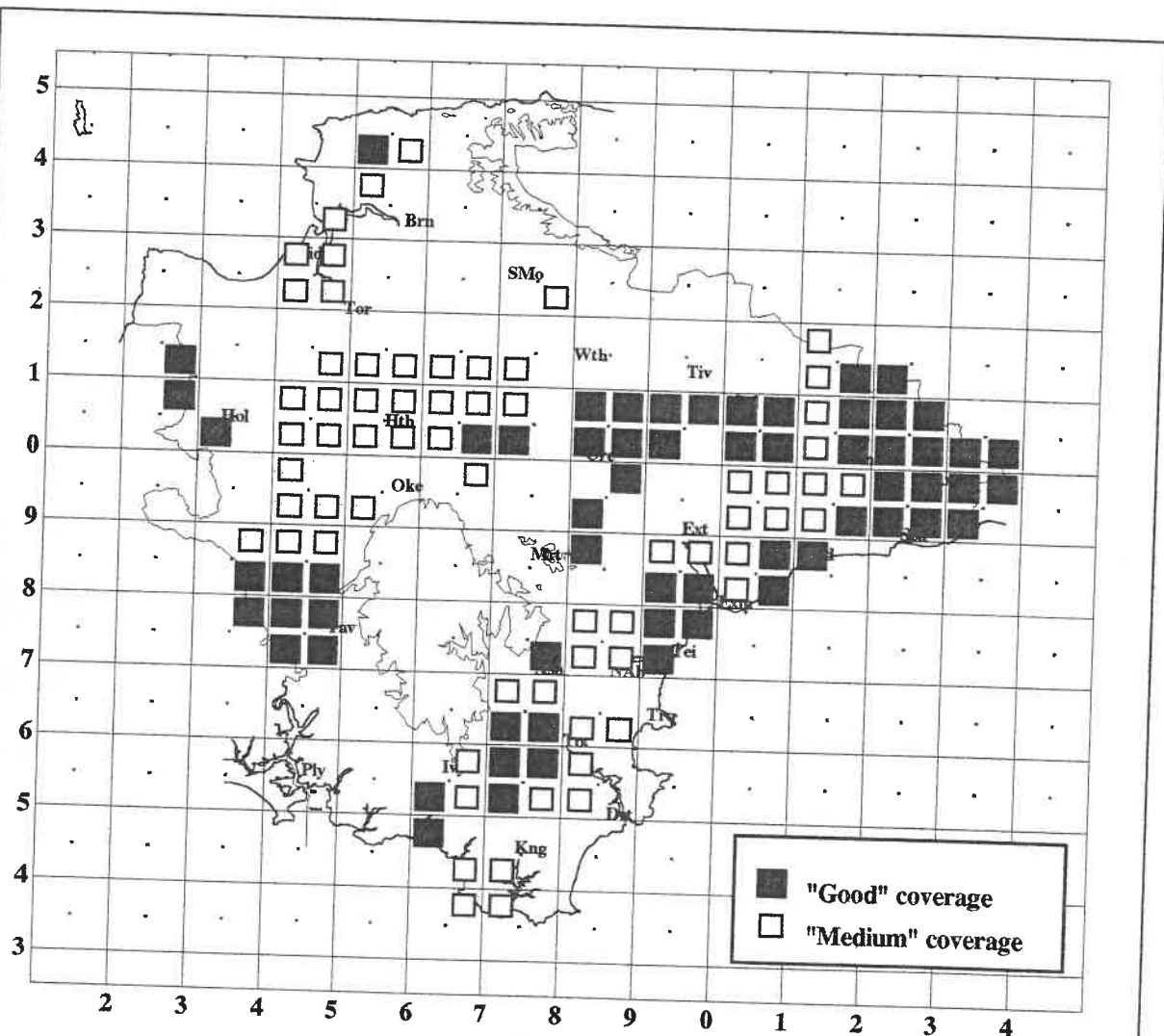


Figure 1:

5 km squares assigned to volunteers for BOT/DBWPS Barn Owl Survey 1993, to show the extent of coverage.

Although rather subjective, we have assigned each allocated square to one of two categories:- *Good Coverage* where over 50% of farmsteads were visited by the volunteer, who interviewed the farmer or owner and may have searched some potential sites; and *Medium Coverage* where less than 50% of farmsteads were visited. For all other squares, we were reliant on rechecking historic data and/or receiving information from the public.

Rechecking of sites found during the 1983 DBWPS Barn Owl Survey:

The 1983 DBWPS Barn Owl Survey (M Davies, unpublished) located a combined total of 116 breeding or roosting sites. Of these, 66 were rechecked during the course of the current survey and Barn Owls found to be present (breeding or roosting) at only 28 (42%) of them. Also, of 449 occupied sites known to the BOT within the last ten years, 235 were unoccupied and only 214 (48%) had signs of birds being present (125 roosting and 89 breeding).

Analysis of breeding and roosting sites:

Most, though not all, of the record cards noted the types of breeding and roosting sites and an analysis of these may be found in Tables 1 - 3.

Table 1: Main building type:

	Agricultural in use	Agricultural disused	Domestic in use	Domestic disused
Breeding	55	40	13	5
Roosting	58	64	4	7
	-----	-----	-----	-----
	113	104	17	12

Table 2: Type of agricultural building:

	Storage	Stock Shed	Linhay	Dutch Barn
Breeding	54	23	8	10
Roosting	56	29	5	13
	-----	-----	-----	-----
	110	52	13	23

Table 3: Location of nesting or roosting site:

	Nestbox	On/in wall/beam	Barn Loft (upper storey)	Hay Bales	Roof Space	On floor or ground
Breeding	52	27	4	5	5	2
Roosting	22	69	3	5	4	-
	-----	-----	-----	-----	-----	-----
	74	96	7	10	9	2

There were also only three records of breeding in tree cavities (two in oak, one in beech) and one in a tree nestbox, and there were no records of roosting in tree holes (although this was probably due to difficulties in locating such roosts). Other breeding locations were three in disused churches or chapels (churches in use tend to be wired up to exclude Jackdaws and pigeons), three in dovecotes (two in/on barns and one free-standing stone tower), two stables and a school (all in use), a mill and a quarry storage building (both disused). One of the domestic sites was down the chimney of an occupied dwelling, and two of the agricultural sites were in a disused dry water tank and a large grain hopper. Roosting sites also included three in holes in quarry faces, a disused railway station, a disused radar station and a cricket pavilion (in use). Finally, three were in domestic sheds or garages.

Distribution of breeding and roosting sites recorded during the 1993 survey:

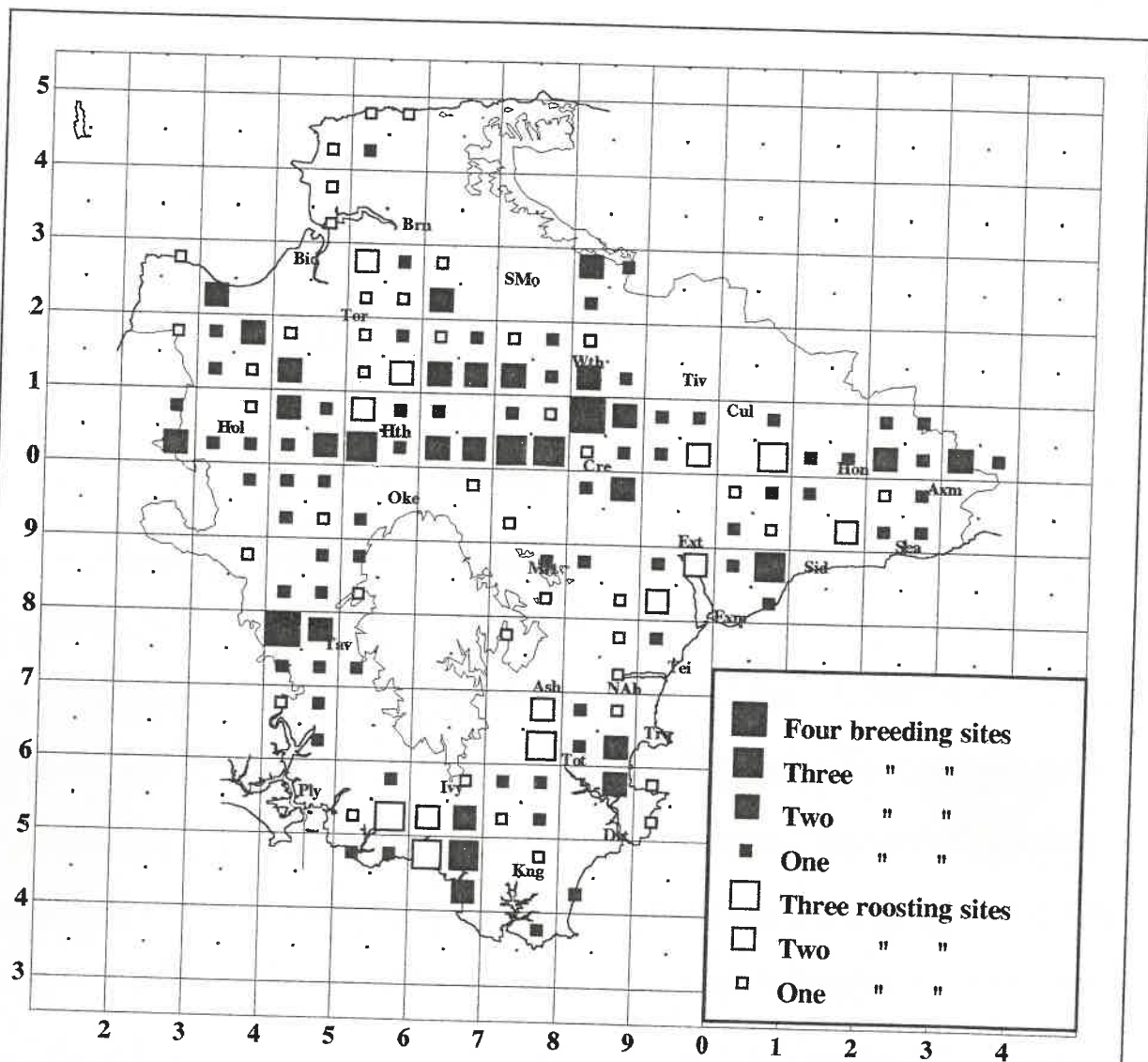


Figure 2:

The distribution of known roosting sites occupied at some time during 1993 and known sites where breeding occurred in 1993, in the county of Devon. (Note that in any square with one or more breeding records, roosting records are not shown; and that blank squares do not necessarily indicate the absence of Barn Owls).

Overall, 137 breeding sites and 151 roosting sites were recorded during the survey, and of the roosting sites, 71 were found in 5 km squares where no breeding was recorded (see figure 2). The maximum of four breeding pairs was reached in only two squares (in the Crediton and Tavistock areas), but we have records of simultaneous breeding at sites within 400 metres of each other. The main concentration of records were mid- to West Devon, from Crediton to Hatherleigh, Holsworthy and Tavistock. Records were surprisingly thinly scattered in East Devon and with gaps also obvious in parts of the South Hams, around the fringes of Dartmoor and a great swathe along the Somerset border.

Discussion:

Despite the noise emanating from a breeding site and frequent food deliveries during the height of the breeding season, Barn Owls are extremely difficult to find and are undoubtedly grossly under-recorded. Even in his well-worked 10 km square ST20, GP has only recently found an additional breeding site unknown to him but regularly used over the last few years. In the 5 km square SX77-SE, the BOT had only two old (1984) records and DJR 'felt' that there were no Barn Owls present. As part of this survey, every farmstead was visited and all leads followed up by searches resulting in a confirmation that no sites were recorded. Conversely the square SX86-SW, where BOT had two records (one breeding and one roosting) as a result of this survey, was subject to a very intensive search during 1994 of every potential site which proved that the actual number of sites used by Barn Owls was eight (two breeding and six roosting)! In summary, the coverage of this survey was low and there is no doubt that the Barn Owl is under-recorded as intensive searches (particularly here in Devon where there are numerous farm buildings and trees) are extremely time consuming.

The distribution shown in figure 2 is very similar to that found during the Tetrad Atlas years 1977-1985 (Sitters, 1988). The areas with the highest recorded Barn Owl densities are in central, north-west and west Devon. These areas have good numbers of nestboxes and a high level of interest from field workers. The relatively high quality farmland of East and South Devon holds rather fewer owls and we certainly seem to have lost the apparent concentration of breeding birds in the Barnstaple-Ilfracombe areas. However, there was only one 'good coverage' square in this latter area. Also, four full 10 km squares along the Somerset border in which no owls were recorded in our survey had Barn Owls present in the New Atlas of Breeding Birds in Britain and Ireland, 1988-1991; and conversely we recorded birds in seventeen 10 km squares for which the New Atlas had no records (Gibbons, Reid & Chapman, 1993). Owing to the methods used and coverage attained, it is important to view the distribution map (figure 2) with caution; it only reflects the presence of owls, not their absence. Much of the survey consisted of rechecking records resulting from past media appeals and information received by the BOT which were not biased to any particular area. There is therefore a semi-random element in the data which, whilst adding to its value, does not preclude other biases. Hence interpretation of the results is difficult.

Barn Owls are known to show considerable site fidelity, often using the same traditional sites for many years. It is particularly disappointing that of the 66 DBWPS 1983 records rechecked, only 42% were still occupied. Similarly of the 449 BOT sites dating from 1984-1992 rechecked, only 48% were occupied in 1993. Some sites checked by BOT which are now devoid of owls were barns either in the last stages of decay or totally demolished, or are now converted for human dwellings. However, most sites were still available and there were no obvious reasons for the owls' disappearance. Breeding Barn Owls normally make use of a number of roosting sites within a kilometre or two of the breeding site, and these roosting sites may in turn be used for breeding in subsequent years. Thus the simple rechecking of single buildings or trees can easily overlook a pair which have moved to a different site nearby. As a survey technique, this method (rechecking known sites) has severe limitations as it is not able to determine whether the lack of occupancy is a result of reduced site fidelity or a real decline in numbers.

From table 1, there are slightly more records of roosting birds using disused buildings than in buildings which are in use for agricultural or domestic purposes but, perhaps surprisingly, the reverse is true for breeding birds. Whereas roosting birds use beams or tops of walls and can be frequently flushed from the building, breeding Barn Owls are usually hidden away in holes or boxes and can keep out of sight and may even become more tolerant of regular disturbance. More domestic breeding sites are in use (for human habitation) than are disused, but of course many disused dwellings have now been knocked down, or have become roofless, or are now redeveloped. However, if provision for Barn Owls is incorporated into a barn conversion, the owls may be encouraged to stay (Ramsden, in prep). Similarly, at some existing dwellings, the human residents have deliberately provided a suitable nest site in the attic and now have owls sharing their home.

Within agricultural buildings (table 2), over half of both breeding and roosting sites were in storage barns; but this should be expected since these buildings are common-place in Devon. An analysis was made, where details were given on the record cards, of the types of materials used in the construction of barns used by Barn Owls but this simply tended to show the predominant geology of the district, e.g. cob in mid, south and south-east Devon, and granite in the west, etc. However, although 11% of roosts were in storage or stock sheds with corrugated walls, only 4% ($n=3$) of breeding locations were in similar situations. This type of site does not provide tops of walls or holes for nesting. They can also be much colder and more draughty than barns with thick walls and hence maybe less attractive as potential Barn Owl nest sites. Just over 10% ($n=10$) were nesting in Dutch barns, but all bar one of these were in boxes; and of 13 roosting in Dutch barns, nine used boxes and four were amongst the bales of hay or straw. Surprisingly, only five nests were found amongst bales and four of these were in storage barns. The use of this traditional site seems to have decreased. Formerly, an appreciable number of eggs and young must have been unintentionally destroyed by farm workers and the fact that birds now seem to prefer boxes does lead to a much higher number of successful broods. Out of all breeding sites where the nest position was known, the majority ($n=52$) were in nest boxes (table 3). It must be borne in mind however, that this may be biased since it is easier to find nests in boxes, which are monitored regularly, than to locate more traditional sites. Roosting birds can use beams and tops of walls, and use of the latter for breeding is also apparent.

For comparison, a brief analysis of the nest record cards held by the British Trust for Ornithology for Barns Owls breeding in Devon was made. There are 28 cards in the archives for the period 1955-1980. Of these, 16 were in buildings (2 domestic), six amongst bales and six in hollow trees. None were recorded in nestboxes. For the period 1981-1985, there are 40 cards. 16 nests were recorded on/in holes or ledges in buildings, three were in disused churches, six amongst bales and 15 now in nestboxes. None were recorded in hollow trees. Of these 40 sites, 18 were described as derelict. The interest in the Barn Owl in the early eighties can clearly be seen, resulting in an increase in the numbers of nest record cards submitted and a large number of boxes starting to be placed in buildings.

In ST20, at seven out of the nine breeding sites known over the last six years, at least one bird of each breeding pair was a released bird or the offspring of a released bird (Pearce, pers comm). Carefully controlled releases of captive-bred birds may therefore help increase the population or even form a nucleus of birds in areas where owls have otherwise disappeared. However, it should not be considered that the results of this survey are biased

by released birds, although if carried out in the proper manner, these do survive as well as their wild counterparts (Grant, in prep). Out of 214 BOT site records for 1993, only seven were sites where captive-bred birds were released by the Trust since 1985 (4 breeding, 3 roosting).

From our own Devon-ringed birds, it is apparent that the majority of recovered Barn Owls are killed by road traffic within their first year of life (Grant & Ramsden, unpublished; Pearce, 1992). Young birds are forced to travel to find suitable habitat and roosting/breeding sites, and of course, the further a young bird travels, the more likely it is to encounter a main road and almost certain death. The effect of the presence of major roads on the distribution of the more sedentary adult population has yet to be investigated. However, it may be noted that the area along the route of the M5-A38 from the Somerset border, south-west to Exeter and then round the southern fringe of Dartmoor to Plymouth, and also along the northern fringe of Dartmoor (A30 to Okehampton) holds very few breeding records (see figure 2). However, this may be due to a general lack of coverage in these areas.

Excluding the built-up areas of Plymouth, land above the 300m contour and those border squares with less than 50% within the county (but including those squares with more than 50%), there are 260 5km squares in Devon apparently suitable for Barn Owls. Of these, birds were present in 149 (plus 3 in fractional border squares). It may be seen from figure 2 that, overall, there were 1.4 breeding sites reported per occupied 5 km square and a similar figure of 1.3 for roosting sites in squares where no breeding was recorded. This of course takes no account of squares which may contain no Barn Owls. Perhaps a better indication of breeding density is given by using only those squares with good coverage (but excluding fractional border squares). In this case, 44 breeding sites in 43 squares gives an average of 1.0 sites per square. Using these figures, the total county population may be in the order of 250-350 pairs. It seems that the dramatic decline apparent during the 1970/80's may have halted, with perhaps some indications of a slight reversal?

Summary:

The Barn Owl is still widely distributed within the county, with a population density of three or more pairs per 5 km square found in some parts of central, west and north-west Devon. Few breeding or roosting records were reported from Dartmoor and its fringes and the Somerset border area. In total, 137 breeding sites and a further 151 roosting sites were known to be occupied in 1993.

The majority of known sites are traditional agricultural buildings (both in use and disused) with cob or stone walls. Where birds were known to be breeding in modern type or open Dutch barns, nest boxes were used in most cases.

Barn Owls are very difficult to survey. Exhaustive searches of all potential sites were not undertaken. The survey included the rechecking of over 500 known historic sites, of which over half (53%) were found to be unoccupied. The county population is estimated to be within 250-350 pairs to which the release of captive-bred birds, the provision of nestboxes (particularly in modern farm buildings and barn conversions) and the creation of foraging habitat has probably contributed.

Given that we are unlikely to see a return of the large scale habitats available to it during the early part of this century or a major reduction in our transport systems, we can still help the Barn Owl retain a viable, albeit much lower, population. There is hope for this enchanting bird.

Acknowledgements:

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Appendices:

A.

Survey Card

1993 - DEVON BARN OWL SURVEY A Joint by The Barn Owl Trust (Tel: 0364-653026) and Project Devon Bird Watching & Preservation Society					
Description of Site: (please circle or specify as necessary)					
BUILDING: used disused		TREE: species		KILN, CAVE, TUNNEL etc: specify	
TYPE OF BUILDING: agricultural domestic industrial church dovecote other					
AGRICULTURAL TYPE: dutch stables storage stock shed linhay other					
WALLS: brick stone cob wood corrugated other					
ROOF: tile slate thatch wood corrugated other					
POSITION OF NEST: in/on bales box barn loft roof space on/in wall other					
Description of Area: (please circle one or more) pasture cereal mixed water meadow young conif. young decid. other					
Location: Place name: Nearest town: Name of owner or tenant:		O S Grid Reference: For office use only		Date last seen:	
Further Information (please circle or specify as necessary)					
Evidence of roosting at site: birds seen pellets feathers other					
Evidence of breeding at site: eggs/yg seen adults carrying food other					
Any other details:					
Is site under threat (eg. barn falling down, barn conversion, vandalism etc) ?					
Your name: Tel No:					
Address:					
Please post this form directly to: The Barn Owl Trust, Waterleat, Ashburton, TQ13 7HU or Geoff Pearce, DBWPS, 103 Mount Pleasant Road, Exeter, EX4 7AB					Tel: 0364-653026

B.

Survey Card (reverse)

BARN OWL GUIDELINES

- All census workers are reminded that, under the Wildlife and Countryside Act 1981, it is illegal to visit the nest, or wilfully disturb breeding Barn Owls, or their dependant young (even if fledged), without a Schedule 1 licence.
- To detect or confirm roosting birds, it is recommended that workers visit possible sites in buildings or trees before March or after September, but repeated visits to occupied sites may cause birds to desert the site.
- During the breeding season (April to Sept), do not visit a known breeding site without the required licence. A brief inspection, from the entrance of a likely barn, does not contravene the legislation but the observer must retreat on sighting an adult or young Barn Owl, or other-wise confirming their presence by fresh pellets or pellets etc.

DO NOT CLIMB UP TO PROBABLE NESTS

- In order to avoid unnecessary disturbance to sites by field workers, including Schedule 1 licence holders, please liaise for the purposes of this survey with either:
David Ramsden, Barn Owl Trust, Waterleat, Ashburton, TQ13 7HU.
(0364-653026) or
Geoff Pearce, 103 Mount Pleasant Road, Exeter, EX4 7AB.

DO NOT ENTER ON TO LAND OR INTO BUILDINGS WITHOUT THE PERMISSION OF THE OWNER OR HIS/HER AGENT.

Please return completed forms as soon as possible, and in any case no later than 31st December 1993.