A358 Taunton to Southfields Dualling

Barn Owl Survey Technical Report

PCF STAGE 2

HE551508-MMSJV-EBD-000-RP-LB-0037

Notice

Date: March 2021

Version: P02

Highways England Programme Leader:	Andrew Alcorn
Highways England Project Manager:	Olivia Blok
Mott MacDonald Sweco Joint Venture Project Manager:	Amar Parkinson
PCF STAGE 2 Supplier:	Mott MacDonald Sweco Joint Venture

Document control

Client	Highways England
Project	A358 Taunton to Southfields Dualling
Document title	Barn Owl Survey Technical Report
Job no.	HE551508
Document reference	HE551508-MMSJV-EBD-000-RP-LB-0037

Revision history

Job number: 370774			Document ref: HE551508-MMSJV-EBD-000-RP-LB-0037			
Revision	Purpose description	Originator	Checked	Approved	Authorised	Date
P01	First Revision	D Locke	R Purslow	K Atkinson	E Rapa	12/11/2020
P02	Updated following comments	D Locke	S White	K Atkinson	E Rapa	18/03/2021

Prepared for:

Highways England
Temple Quay House
2 The Square
Temple Quay
Bristol
BS1 6HA

Prepared by:

Mott MacDonald Sweco Joint Venture
Stoneham Place
Stoneham Lane
Southampton
Hampshire
SO50 9NW

Table of contents

Executive summary

The proposed A358 scheme (hereafter referred to as 'the scheme') would provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the A303 at Ilminster to the M5 motorway to the north. The scheme would include grade separated junctions and, with the purpose of providing a high quality free flow journey for those using the route, the removal of at-grade junctions and direct accesses.

This report investigates the presence of barn owls in the study area (1.5 kilometres either side of the scheme redline boundary). It presents the results of the 2016 data search, along with the Stage 1 on site scoping, Stage 2 investigative field surveys and Stage 3 nest verification surveys.

Eighteen records of barn owl were returned by the data search from 1900 to 2012. Breeding was confirmed in Ashill in 1995 and was recorded as possible in Creech St Michael in 2000. The closest record is a 2002 record adjacent to the A303 at the south end of the scheme. No records of barn owl road deaths were returned.

The Stage 1 and 2 surveys identified areas of Type 1 and 2 barn owl foraging habitat typical of lowland farmland in Somerset along the length of the scheme, particularly around Henlade, Haydon, Ruishton, Horton Cross, Stewley, Hatch Beauchamp and Ashill. Type 1 habitat within the survey area is largely restricted to field margins.

Stage 3 surveys identified four occupied breeding sites (OBS), five active roost sites (ARS) and one temporary rest site (TRS). All OBS and four of the five ARS were on the western side of the current and planned realignment of the A358 and biased towards the southern end of the scheme.

1. Introduction

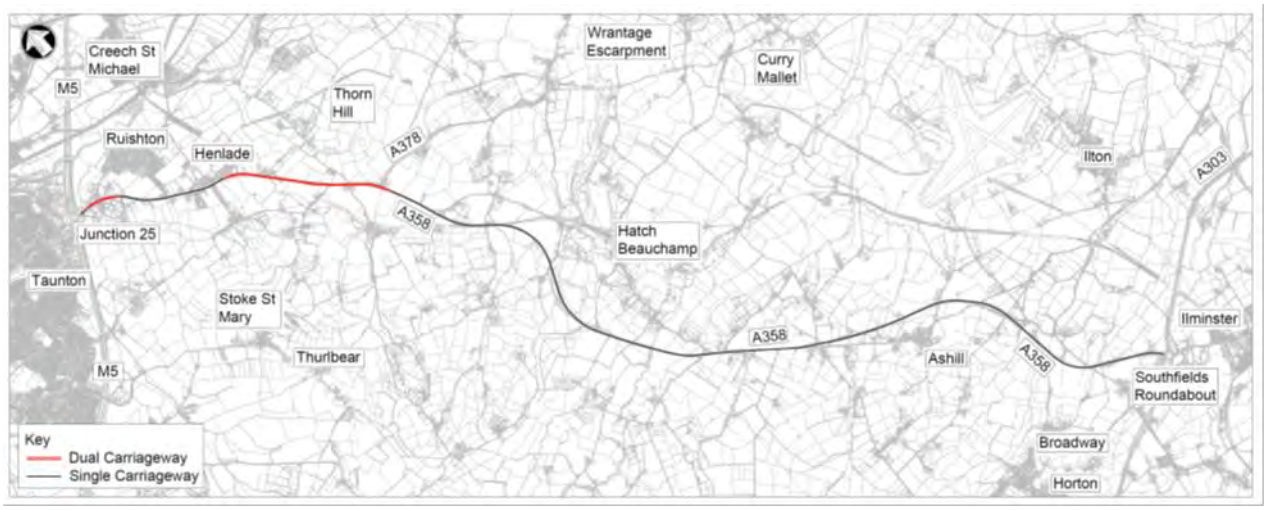
1.1. Background

1.1.1. The A303 / A358 corridor is a vital connection between the south-west, London and the south-east. Due to the population density, employment opportunities, urban concentrations and tourist attraction of the South West the A303 / A30 / A358 corridor experiences a wide range of traffic flows which lead directly to severe and regular instances of congestion and delay.

1.1.2. The A303 / A30 is part of the strategic road network (SRN) and together with the A358 forms a key strategic link between the South West Peninsular (SWP) and the rest of the south, south-east and London. Although it is dualled over much of its length there are several unimproved single carriageway sections between the M3 motorway at Basingstoke and the M5 at Taunton and Exeter which cause congestion, especially during summer weekends.

1.1.3. The existing A358 between Taunton and Southfields Roundabout is predominantly single carriageway with a short (1.1 miles) dual carriageway section in the vicinity of Thornfalcon and a 3 lane (2+1) section (0.3 miles) immediately to the south of that. It has many side roads and private accesses directly onto it. The national speed limit applies between Southfields and Henlade where it reduces to 30mph; the speed limit increases to 40mph north of Henlade on the approach to M5 Junction 25. A plan showing the existing route between Taunton and Southfields is provided in Figure 1:1.

Figure 1:1 : A358 Taunton to Southfields existing road layout

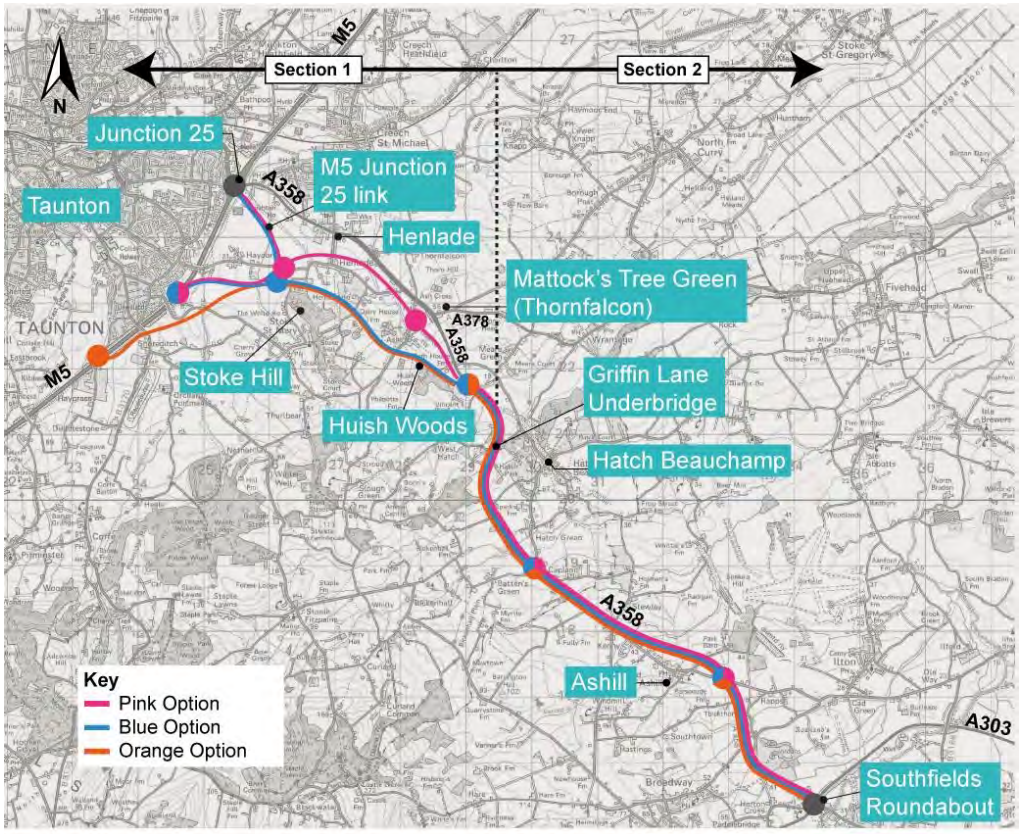


1.1.4. The proposed A358 scheme (hereafter referred to as 'the scheme') would provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the A303 at Ilminster to the M5 motorway to the north. The scheme would include grade separated junctions and, with the purpose of providing a high quality free flow journey for those using the route, the removal of at-grade junctions and direct accesses.

1.1.5. Three potential route options were chosen, the Orange, Pink and Blue. At the public consultation in 2017 only the Orange option was presented. A further consultation was held in 2018 in which all three options were presented. The three route options presented at the 2018 consultation are described and illustrated in Figure 1:2 below:

- The **Pink option** commences at a new junction on the M5 approximately 1.2 miles (2 kilometres) south of junction 25. South-facing slip roads from the M5 would combine to become the new dual carriageway, which runs eastwards and north of Stoke Hill. Here a limited-movement junction is proposed with east-facing slip road connections to the new road which would allow traffic to travel between the new A358 and junction 25 via a new 0.9 mile (1.5 kilometre) dual carriageway link past the planned Nexus 25 site. The proposed route would then follow the existing A358 to Southfields Roundabout enabling the existing road to be upgraded from a single to a dual carriageway. The total length of the Pink option is 9 miles (14.6 kilometres), plus the 0.9 miles (1.5 kilometres) spur leading to M5 junction 25.
- The **Blue option** commences at the M5 approximately 1.2 miles (2 kilometres) south of junction 25 and runs eastwards on a more southerly alignment. At Stoke Hill a junction is proposed similar to that with the Pink option which would allow traffic to travel between the road and junction 25 via a new 1.2 miles (2 kilometres) dual carriageway link past the planned Nexus 25 site. The road would then continue in a south easterly direction to West Hatch Lane, where an all-movement, grade-separated junction is proposed to allow access to Hatch Beauchamp, Henlade and surrounding communities, and the A378. This option is identical to the Pink option from this point onwards to Southfields Roundabout. The total length of the Blue option is 8.7 miles (14.1 kilometres), plus the 1.2 miles (2 kilometres) spur leading to M5 junction 25.
- The **Orange option** commences at the M5 approximately 2.1 miles (3.5 kilometres) south of junction 25 at a proposed new 2-bridge roundabout which would form a new all-movements junction between the new A358 and the motorway. The proposed road initially takes a north-easterly course towards Henlade before arcing around the north of Stoke Hill. In contrast to the Blue option, there is no link to junction 25 from this location, and therefore no junction at Stoke Hill. This option is identical to the Blue option from this point onwards. The total length of the Orange option is 9.5 miles (15.3 kilometres).

Figure 1:2 : Route options presented at the public consultations in 2018



Source: Mott MacDonald Sweco Joint Venture. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

1.2. Scheme proposal

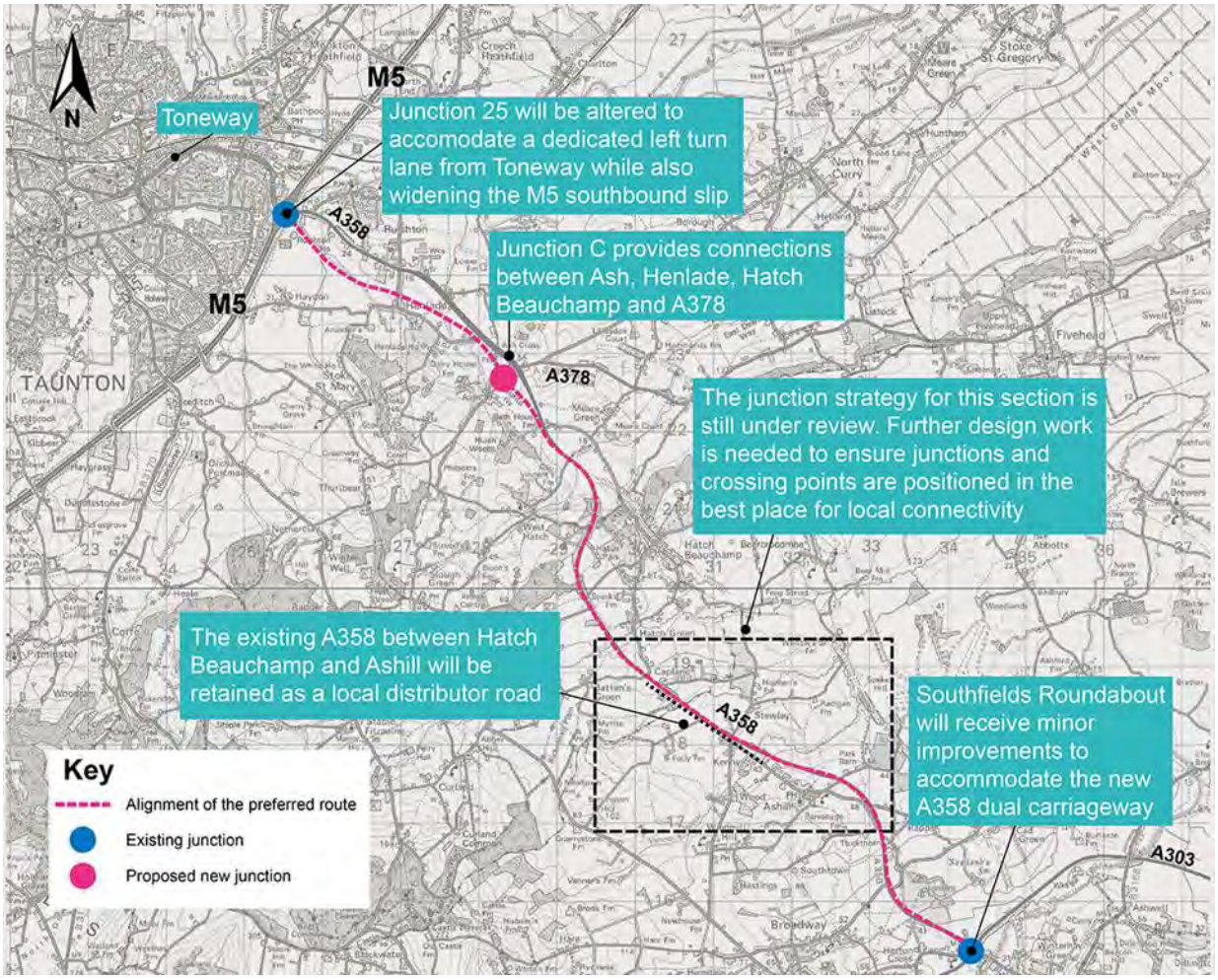
1.2.1. The Pink option is the most expensive option, but as the best performing of the three options and the option attracting strong support from the 2018 consultation, it was trialled for modification to reduce the scheme cost. This revised option is referenced as the Pink Modified option.

1.2.2. The Preferred Route Announcement (PRA) on the 13 June 2019 identified the Pink Modified option as the preferred route option, (refer to the Scheme Appraisal Report (SAR) for details of the development of the Pink option to the Pink Modified option).

1.2.3. The Pink Modified option would comprise online widening between West Hatch Lane and Southfields Roundabout. This option would involve the re-use of a large amount of the existing A358 corridor, and between West Hatch Lane and Henlade the route would pass close to the A378 junction at Mattocks Tree Green. This would enable direct interchange between the proposed road and the A378. The Pink Modified option retains a bypass of Henlade, connects with the A378, and connects directly to junction 25 on the M5. A plan showing the Pink Modified route is shown in Figure 1:3 below.

1.2.4. The scheme would provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the A303 at Ilminster to the M5 motorway to the north. The scheme would include grade separated junctions and, with the purpose of providing a high quality free flow journey for those using the route, the removal of at-grade junctions and direct accesses.

Figure 1:3 : Pink Modified option



1.3. Purpose of the report

1.3.1. This barn owl Technical Report has been prepared during Stage 2 of the Highways England's Project Control Framework (PCF). This Technical Report provides an overview of the barn owl survey results undertaken in 2017 and 2018 within 1.5 kilometres of the Pink Modified option. The report provides methods, constraints and results of the barn owl surveys undertaken for the scheme. Results of surveys undertaken that are now not within 1.5 kilometres of the preferred option are presented in Appendix B and C for completeness.

1.4. Scope of report

1.4.1. The objectives of the report are to present the methodology, constraints and results of the barn owl *Tyto alba* surveys.

1.4.2. The report does not provide any detailed impact assessment or recommendations for mitigation as this aspect will be developed by the RDP DIP supplier during PCF Stage 3 of the scheme.

1.4.3. Guidance on ecological assessment recommends that all ecological features that occur within a zone of influence (ZoI) for a proposed scheme are investigated (Chartered Institute of Ecology and Environmental Management (CIEEM), 2016)[1]. All areas within 1.5 kilometres of the Pink Modified options' proposed scheme footprint were assessed for barn owl suitability.

1.5. Legislation

1.5.1. In the UK all wild birds, their nests and their eggs are protected by the *Wildlife and Countryside Act 1981* (as amended). Offences under this Act include:

- intentionally killing, injuring or taking any wild bird
- intentionally taking, damaging or destroying the nest of any wild bird whilst it is in use or being built
- intentionally taking or destroying the egg of any wild bird

1.5.2. It is also an offence to intentionally or recklessly disturb any wild bird listed on Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended), including the barn owl. They are protected from such disturbance whilst nest building, at / near a nest containing eggs or young, and whilst they have dependent young.

1.5.3. Barn owls are not listed as a species on the *Somerset Biodiversity Action Plan*.

1.6. Status of barn owl

1.6.1. Barn owls have undergone a recent range expansion after a low point evident during the 1970s and 1980s, as shown by The British Trust for Ornithology (BTO) breeding bird atlases for 1976 and 1993 (Figure 1:4).

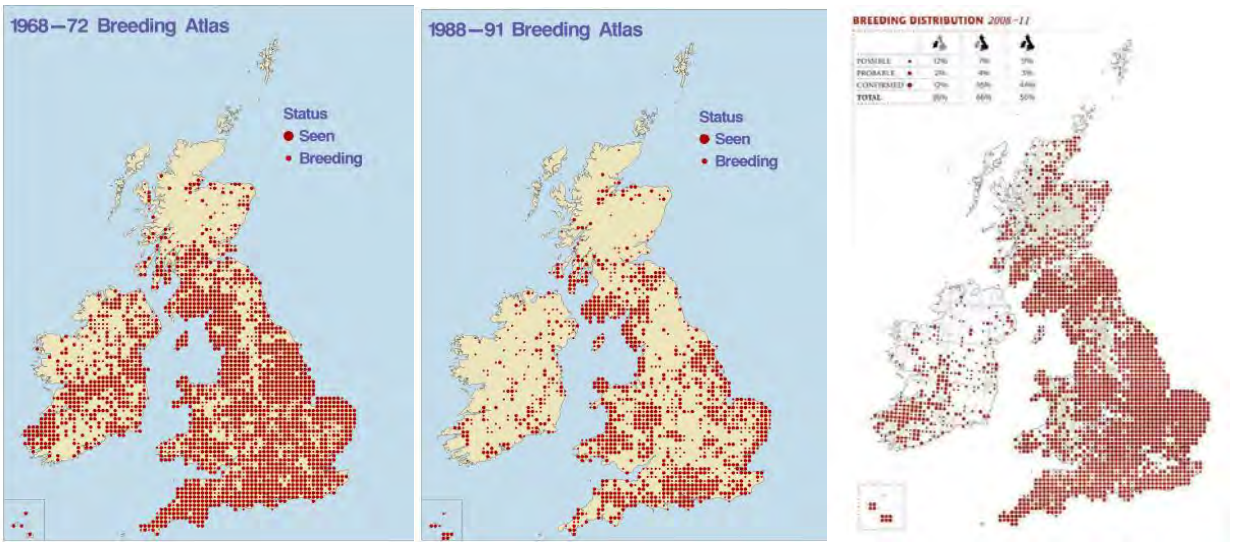
1.6.2. The UK population was estimated to be between 3,000 and 5,000 breeding pairs[2] between 1994 and 1997. A more recent assessment by the Rare Breeding Birds Panel, shows the number of pairs has increased by four and a half times between 1996

[1] Chartered Institute of Ecology and Environmental Management (2016) Guideline for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Costal.

[2] Toms, M.P., Crick, H.Q.P., & Shawyer, C.R. (2001). The status of breeding Barn Owls *Tyto alba* in the United Kingdom 1995-97. Bird Study 48:23-37

and 2005 and is no longer considered to be a rare breeding bird in the UK[3]. The barn owl was Amber listed on the *Birds of Conservation Concern*[4] but was moved to the UK Green list in 2015 due to its range expansion and population recovery.

Figure 1:4 : UK distribution of Barn Owls for 1976 (left), 1993 (centre) and 2008-11 (right)



Source: British Trust for Ornithology and Barn Owl Trust (https://app.bto.org/mapstore/StoreServlet?id=279) & (https://www.barnowltrust.org.uk/barn-owl-facts/barn-owl-distribution-uk/)

1.7. Barn owl ecology

1.7.1. Although found across Britain in a range of habitats, barn owls are typically birds of lowland farmland and are strongly associated with rough open grassland. In contrast with continental barn owl populations, the British population is largely sedentary[5] and breeding birds are highly site faithful[6]. Young barn owls typically leave their natal sites soon after fledging, on average travelling 12 kilometres over the following four or five months.

1.7.2. Except for the immediate area around a nest site, barn owl territories are poorly defended, if at all[4,7]. The extent of a home range can vary considerably with most birds found within 1 kilometre of the nest site during the breeding season, although they may range up to 2 kilometres. In winter the foraging range increases up to 4-5 kilometres from nest sites[7].

1.7.3. Within a home range a pair of barn owls may have one nesting site, up to three regular roost sites, and up to five sites that they only visit occasionally[8]. Roost and nest

[3] Holling, M. & Rare Breeding Birds Panel (2008). Rare breeding birds in the United Kingdom in 2005. British Birds 101:276-316.
[4] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D. and Gregory, R. (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 108, 708-746.
[5] Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds). (2002) The Migration Atlas: movements of the birds of Britain and Ireland. T. & A.D. Poyser, London.
[6] Barn Owl Trust (2006a). Roosting and nesting places. Available at http://www.barnowltrust.org.uk/infopage.html?Id=74
[7] Taylor, I.R. (1994). Barn Owls: Predator–prey Relationships. Cambridge University Press, Cambridge.
[8] Barn Owl Trust (2006b). Barn Owl home range. Available at https://www.barnowltrust.org.uk/barn-owl-facts/barn-owl-home-range/.

sites are in buildings, purpose-built nest boxes and tree cavities. In drier, eastern areas, the proportion of roosting and nesting sites in tree cavities can be up to 70% although there is no direct preference and barn owls will use whichever is available to them[10].

1.7.4. Barn owls often live alongside people in all but the most extreme disturbance[18], with a varying degree of tolerance to human activity depending on the stage of the breeding cycle[9,12], the height of the nest above the ground, how well hidden the nest is, the length of occupation of the site and the level of disturbance.

1.7.5. Barn owls hunt predominately between dusk and dawn but can often be seen hunting during the day, especially in the main breeding season or if rain or wind has prevented them from hunting at night. Their breeding success is strongly linked to the short-term fluctuations in the availability of field voles *Microtus agrestis*, their favoured prey[8]. The species composition can vary seasonally and between years[12]. Common shrew *Sorex araneus* tends to be taken in greater proportion in spring and summer, field vole from late autumn to early spring[10,11] and the wood mouse *Apodemus sylvaticus* in late summer and autumn[12]. They are strongly associated with areas of extensive rough grassland with a well-developed sward structure which will support small mammals. Young conifer or deciduous plantations, riverbanks and arable landscapes with linear strips of rough grassland can also support hunting barn owls.

1.8. Barn owls and major roads

1.8.1. Barn owls are known to be particularly susceptible to road traffic collisions and are the most frequently encountered road killed raptor or owl[13]. The combination of their low-level (<5m) hunting flight behaviour and the concentration of prey animals in rough grass verges of major roads brings them close to moving vehicles.

1.8.2. It is estimated that 3,375 individuals are killed on major roads in the UK each year[14], accounting for at least 50% of known barn owl mortality[15]. Major roads can result in the complete absence of breeding barn owls within 0.5 kilometres of a road and it is not until 25 kilometres from a major road that its effect on barn owl populations cannot be detected[13].

[9] Taylor, I.R. (1994). Barn Owls: Predator–prey Relationships. Cambridge University Press, Cambridge.
Report No. 57, British Trust for Ornithology, Thetford.
[10] Brown, D.J. (1981). Seasonal variations in the prey of some Barn Owls in Gwynedd. Bird Study 28: 139-146
[11] Love, R.A. (2002). The Mammal Society: National Owl Pellet Survey. Available at http://www.abdn.ac.uk/~nhi775/owl_pellets.htm (Accessed on 14 July 2009).
[12] Montgomery, W.I. (1989). Population Regulation in the Wood Mouse, Apodemus sylvaticus. I. Density Dependence in the Annual Cycle of Abundance. Journal of animal Ecology 58: 465-475.
[13] Ramsden, D.J. (2003). Barn Owls and Major Roads: results and recommendations form a 15-year research project. The Barn Owl Trust, Ashburton.
[14]Shawyer, C. and Dixon, N. (1999) Impact of Roads on Barn Owl Tyto alba Populations DPU 9/51/2. Highways Agency.
[15] Newton, I., Wyllie, I. and Dale, L. (1997). Mortality causes in British Barn owls (*Tyto alba*), based on 1101 carcasses examined during 1963-1996. - In: Duncan, J. R., Johnson, D. H. and Nicholls, T. H. (eds.), Biology and Conservation of Owls of the Northern Hemisphere, Second International Owl Symposium, February 5-9, 1997. USDA Forest Service, General Technical Report NC-190, Winnipeg, Manitoba, Canada, pp. 299-306.

2. Methodology

2.1. Desk study

2.1.1. A detailed biological records search was requested from Somerset Environmental Records Centre (SERC) in 2016 of up to 2 kilometres from the scheme to identify records of barn owl within the ZoI and wider surrounds. The records search was undertaken for the scheme options under consideration at the time. An updated data search will be undertaken in PCF Stage 3.

2.2. Methodology

2.2.1. Field surveys followed the methodology set out in the *Barn Owl Survey Methodology and Techniques* for use in Ecological Assessment[16].

2.2.2. Stage 1, on site scoping and Stage 2, Investigative Field surveys were combined into single walkover surveys in June and July 2017. These were undertaken by two surveyors walking the survey area and assessing all features within the landscape that may offer potential foraging habitat and potential nesting sites. Binoculars were used to assess holes and cavities within trees.

2.2.3. These were followed up by Stage 3 Nest Verification Survey between August and November 2017. Further Stage 1, 2 and 3 surveys at land parcels that were inaccessible in 2017, were undertaken in August 2018. The Stage 1 and 2 surveys are split below into potential foraging habitat surveys and potential nesting surveys below but took place concurrently.

Potential foraging habitat surveys

2.2.4. Grassland habitats within the survey area were defined by their structural composition and systematically identified in terms of their suitability as a feeding resource:

- Type 1 Habitat – Optimum habitat to support field voles; usually permanent, unimproved or semi-natural grassland with varied, tussocky structure and a thatch layer at least 30mm deep and at least 2m wide. Management is absent or occasional grazing only.
- Type 2 Habitat – Sub-optimal to field voles; offers intermediate or transient value to barn owls. May be semi-improved or improved grassland characterised as having a more homogenous, even-height sward with little sign of a thatch layer and some emerging tussock structure. Receives some level of farm management such as occasional fertilisation, annual topping or light grazing.

[16] Shawyer, C. (2011) Barn Owl *Tyta alba* Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Surveying and Reporting. IEEM, Winchester.

- Type 3 Habitat – Very poor habitat for field voles and other small mammals; improved grasslands with a homogenous sward, no tussock structure or thatch layer. High levels of management such as mowing for amenity and / or closely grazed, kept short throughout the year. Acid grasslands and those overgrown with scrub fall into this category.
- Other habitats – Non-grassland habitats such as arable fields and mature woodland which offer little or no value for foraging barn owls.

Potential nesting surveys

2.2.5. The combined walkover of the survey area during daylight hours was used to identify trees, buildings, cliffs, caves or nest boxes which could offer any of the following:

- potential nest site (PNS)
- occupied breeding site (OBS)
- active roost site (ARS)
- temporary roost site (TRS)

2.2.6. Only trees within hedgerows, in open fields or along woodland edges or rides are considered suitable for nesting or roosting barn owls. Unless trees had experienced premature decay, only trees with the following diameter were considered suitable:

- ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus* and crack willow *Salix fragilis*: 0.5m diameter or more (>80 years old)
- horse chestnut *Aesculus hippocastanum* and beech *Fagus sylvatica*, 0.75m diameter or more (>150 years)
- oak *Quercus robur*, 1.5m diameter or more (>250 years)

2.2.7. Buildings or natural structures were noted as potential nest sites if there were entrance holes of at least 80mm diameter and a nesting chamber of at least 250mm x 250mm, including but not limited to:

- agricultural or old industrial buildings with suitable access and possessing an upper floor, loft, roof void, blocked chimney, wide wall plate, bale stack, empty water tank, ducting or large nest box
- disused or derelict cottages or industrial buildings such as aircraft hangers, which possess an open joist, broken ceiling panel, water tank, disused chimney or large nest box
- outdoor nest boxes on poles, trees, buildings or owl towers, which offer a dark chamber
- outdoor bale ricks
- cliffs and quarries with caves or fissures
- river, rail or road bridges containing suitable cavities within their structure
- rural churches and the chimneys of intermittently-used holiday homes

Stage 3 Nest Verification surveys

2.2.8. Stage 3 Nest Site Verification surveys, were undertaken by an ornithologist with a Schedule 1 (barn owl) licence. All PNS noted in the Stage 1 and 2 surveys were inspected for evidence of barn owls; this included the presence of adult barn owls, moulted feathers, pellets, eggs, eggshells, chicks or nestling fluff. A ladder was used to access features not accessible from the ground, including to inspect nest boxes and upper tiers of barns. Where the use of a ladder was unsafe or insufficiently high, a remote camera and light on a telescopic pole was used.

2.2.9. Any sites with confirmed breeding barn owl are hereby referred to as Occupied Breeding Site (OBS).

2.3. Constraints

2.3.1. Access was not permitted at any time to several land parcels across the scheme. Areas with no access are included in the results maps in appendices B & C. The main areas were at Park Barn, Ashill; Myrtle Farm, Batten's Green; and Hatch Park; Hatch Beauchamp.

2.3.2. Access was not permitted for a Stage 3 nest verification survey of PNS 29.

2.3.3. As the surveys were undertaken in 2017 and 2018, it is likely that the extent of Type 1 and 2 Habitats has changed as land use and grazing intensity changes. The extent is unlikely to have changed significantly enough to be a significant limitation.

2.3.4. Mature trees with broken limbs or hollows will have degraded over the last three years but are not likely to have degraded sufficiently enough to develop suitable nesting features. Trees were initially assessed in the summer from the ground, when leaf cover is high, and there is the potential for holes to be missed if they were obscured by leaves or branches.

2.3.5. Biological records obtained from third-parties and presented in the desk study are included as evidence of the presence of barn owl in the study area. Biological records do not typically include observations collected as part of systematic county, regional or national surveys and therefore biological records do not present a complete assessment of a species' distribution or abundance in the study area.

3. Results

3.1. Desk study

3.1.1. Eighteen records of barn owl were returned by the data search from 1900 to 2012. These records; including dates, approximate locations and type of record, are presented in Appendix A. Most of the records were returned from the western side of the current A358, both north and south.

3.1.2. The closest record is a 2002 record from adjacent to the A303 at the south end of the scheme. No records of barn owl road deaths were returned.

3.1.3. Two records were returned of confirmed or possible breeding. Breeding was confirmed in Ashill in 1995, over 1.5 kilometres from the scheme and was one recorded as possible in Creech St Michael in 2000, approximately 150m from the scheme.

3.2. Field survey

Habitat assessment

3.2.1. The landscape within the survey area is typical of lowland farmland of Somerset; a mixture of pasture, arable, deciduous woodland and rural buildings. The grassland present ranges from optimum (Type 1) to very poor (Type 3) suitability to support foraging barn owls. The extents of habitat Types 1 and 2 are included in the barn owl survey maps (Appendix B). Type 3 habitat is not included in this map because of its low value to barn owls.

3.2.2. Areas of Type 1 habitat are found across the scheme but are generally restricted to field margins. There are no significant areas of extensive rough grassland as the majority of the farmland in the area is farmed intensively.

3.2.3. On the western side of the A358, concentrations of wide Type 1 field margins are around Ashill, West Hatch, Henlade and Haydon. Areas of Type 1 are even more limited to the east of the A358, except for wide field margins around Ruishton and Stewley.

3.2.4. Areas of Type 2 habitat are more often found as whole fields on the A358, in areas where grazing pressure is moderate and some thatch has formed. There are large areas of Type 2 habitat around Henlade, Haydon, Horton Cross and West Hatch to the west of the A358. As with Type 1 habitat, the east of the A358 lacks extensive Type 2 habitat. The exception is areas around Hatch Beauchamp and Stewley.

Nest Verification surveys

3.2.5. Four OBS, five ARS and one TRS were identified during the Stage 3 Nest Verification surveys. Forty other PNS were assessed that had no barn owl evidence. Table 3:1 provides details of survey findings for all OBS, ARS and TRS. The locations are presented in Appendix C.

3.2.6. All OBS and four of the five ARS were on the western side of the current A358. Most of the OBS were towards the southern end away from the M5.

3.2.7. Survey details of the forty PNS that recorded no barn owl evidence can be found in Appendix D.

Table 3:1 : Stage 3 nest survey findings

Type	Date	Description	Stage 3 findings
OBS 1	07/08/2018	Box on N. side of oak in hedge. Hawk and Owl Trust box number 1361.	Barn owl flew from box. Long-term use with deep pellet layer. Fresh pellets present and feathers. Ammonia smell moderate.
OBS 2	31/07/2018	Box on tree.	Three juveniles present in box. Box has been in use for several years.
OBS 3	01/08/2018	Box on tree.	Four juveniles present in owl box. Occupied since 2014.
OBS 4	09/08/2018	Box 6m high on oak.	Barn owl flew from box. Two chicks apparently ringed this year.
ARS 1	18/07/2018	Small open fronted stone barn.	Large quantity (50+) of pellets below beam. All appear 6+ months old with some 2+ years old. Male primary feather and secondary present and several scapular feathers.
ARS 2	24/10/2017	Ledge inside rotten trunk on south side of tree.	Moulted primary feather (likely female). Thirty+ pellets, some less than 6 months old.
ARS 3	01/08/2018	Barn with broken wood panel on exterior.	Forty+ pellets including one likely one day old. Extensive dropped body feathers and three male type secondaries.
ARS 4	29/08/2018	Upper floor of barn.	Sixty pellets (three more on ground floor). Lots of whitewash. No feathers present.
ARS 5	24/10/2017	Small cavity in branch on south side 10m high.	Eighteen pellets below oak. Several less than a month old. No evidence within cavity
TRS 1	30/08/2018	Oak tree.	Six pellets beneath tree, older than one month. Whitewash on leaves fresh. No sign of cavity.

4. Conclusion

4.1.1. Eighteen records of barn owl were returned by the data search from 1900 to 2012. Breeding was confirmed in Ashill in 1995 and was recorded as possible in Creech St Michael in 2000. The closest record is a 2002 record adjacent to the A303 at the south end of the scheme. No records of barn owl road deaths were returned

4.1.2. Nest verification surveys recorded four occupied breeding sites (OBS) and five active roost sites (ARS) within 1.5 kilometres of the proposed scheme. Most were found on the western side of the current A358 and towards the southern end.

4.1.3. The habitat within the survey area is typical of lowland farmland in Somerset and lacks extensive areas of Type 1 rough grassland. There are areas of Type 1 rough grassland as field margins in areas around Ashill and Stewley in the south, West Hatch in the centre and Henlade, Haydon and Ruishton in the north.

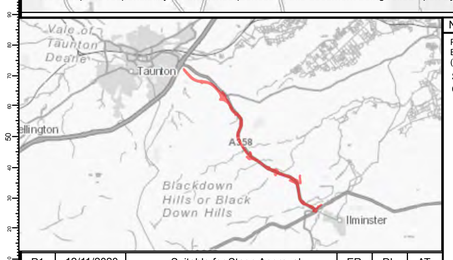
4.1.4. Type 2 rough grassland is more extensive as whole fields within the survey. There are areas of type 2 rough grassland around Henlade and Haydon in the north, West Hatch and Hatch Beauchamp in the centre and Stewley and Horton Cross in the south.

Appendix A

Historic records

Record number	Year	Abundance
1	1989	
2	1990	
3	1990	
4	1995	1 pair Count of proved breeding
5	1995	2 Count of juvenile
6	1900	
7	2012	1 Count of Individual
8	2012	1 Count of Adult
9	2012	3 Count of Adult
10	2012	1 Count of Individual
11	1989	
12	1989	
13	2002	1 Count of hunting
14	2002	1 Count of present
15	2002	1 Count of perching; 1 Count of in flight
16	2003	1 Count of dead
17	1990	1 Count of present
18	2000	1 Count of possible breeding

1:25000 0 1 2 3 Kilometres



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P1	12/11/2020	Suitable for Stage Approval	ER	DL	AT

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Barn Owl data, Somerset Environmental Record (2020)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

Pink modified scheme option

Barn owl historic records

1.5km buffer

References drawings

Drawing Status: Suitable for Stage Approval

Suitability: S4

Mott MacDonald Sweco
Stoneham Place
Stoneham Lane
Southampton
SO50 9NW
Tel : +44 (0)23 8062 8800
Fax : +44 (0)23 8062 8801
www.mottmac.com

Client: highways england

Project Title: A358 Taunton to Southfields

Drawing Title: Barn owl historic records

Scale	Designed	Drawn	Checked	Approved
1:25000	DL	ER	DL	AT

Original Size	Date	Date	Date	Date
A1	12/11/2020	12/11/2020	12/11/2020	12/11/2020

Drawing Number: HE551508 - MMSJV - EBD - 000 - DR - LB - 0070
(HE PIN | Originator | Volume | Location | Type | Role | Number)

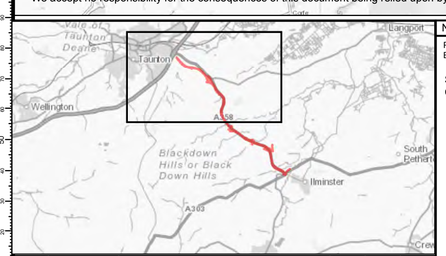
Project Ref. No.: 370774

Revision: P1

Appendix B

Barn owl habitat types

1:15,000 0 1,000 2,000 m



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P2	24/02/2021	Suitable for stage approval	ER	KA	ER

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Barn owl habitat type, Mott MacDonald (2018-19)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

- Pink modified scheme option
- 1.5km buffer
- No access

Barn owl habitat type

- Type 1
- Type 2

References drawings

Drawing Status: Suitable for Stage Approval
Suitability: S4

Mott MacDonald Sweco
Stoneham Place
Stoneham Lane
Southampton
SO50 9NW
Tel : +44 (0)23 8062 8800
Fax : +44 (0)23 8062 8801
www.mottmac.com

Client: highways england

Project Title: A358 Taunton to Southfields

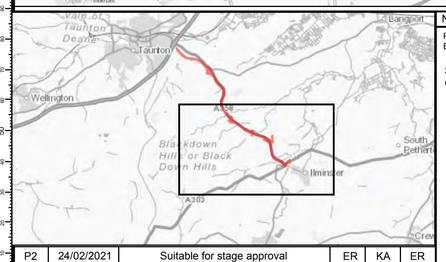
Drawing Title: Appendix B: barn owl habitat types
Page 1 of 2

Scale	Designed	Drawn	Checked	Approved
1:15,000	DL	ER	KA	ER
Original Size: A1	Date: 24/02/2021	Date: 24/02/2021	Date: 24/02/2021	Date: 24/02/2021

Drawing Number: HE551508 - MMSJV - EBD - 000 - DR - LB - 0181
(HE PIN | Originator | Volume | Location | Type | Role | Number)

Project Ref. No.: 370774
Revision: P2

1:15,000 — 0 — 1,000 — 2,000 m



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P2	24/02/2021	Suitable for stage approval	ER	KA	ER

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Barn owl habitat type, Mott MacDonald (2018-19)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

- Pink modified scheme option
- 1.5km buffer
- No access

Barn owl habitat type

- Type 1
- Type 2

References drawings

Drawing Status: Suitable for Stage Approval

Suitability: S4

Mott MacDonald Sweco
Stoneham Place
Stoneham Lane
Southampton
SO50 9NW
Tel : +44 (0)23 8062 8800
Fax : +44 (0)23 8062 8801
www.mottmac.com

Client: highways england

Project Title: A358 Taunton to Southfields

Drawing Title: Appendix B: barn owl habitat types
Page 2 of 2

Scale	Designed	Drawn	Checked	Approved
1:15,000	DL	ER	KA	ER
Original Size	**Date**	**Date**	**Date**	**Date**
A1	24/02/2021	24/02/2021	24/02/2021	24/02/2021

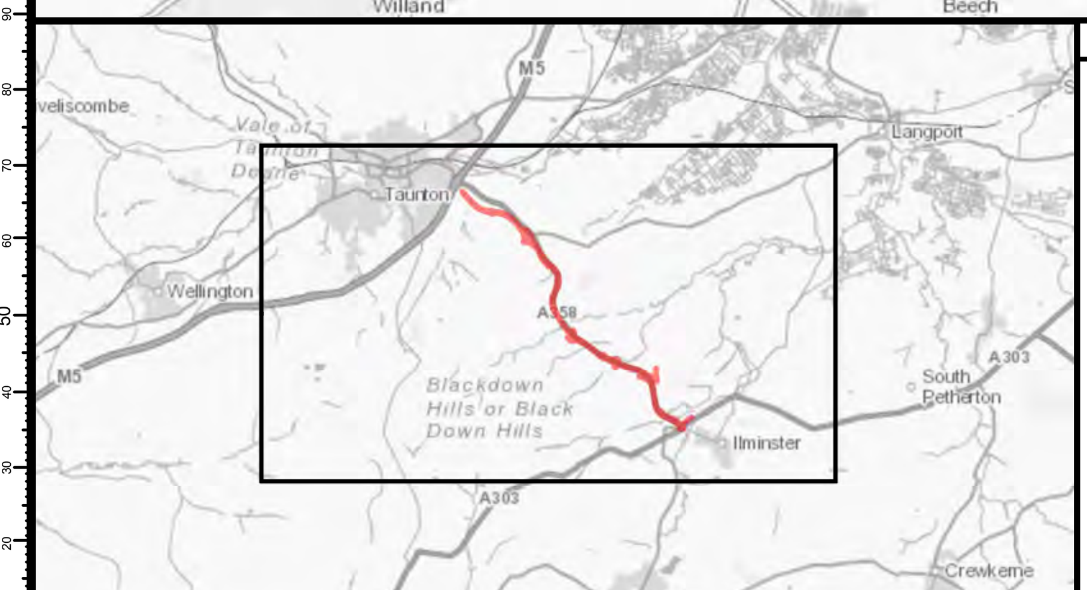
Drawing Number: HE551508 - MMSJV - EBD - 000 - DR - LB - 0182
(HE PIN | Originator | Volume | Location | Type | Role | Number)

Project Ref. No.: 370774

Revision: P2

Appendix C

Barn owl Stage 3 nest site surveys



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P1	19/11/2020	Suitable for Stage Approval	ER	DL	AT

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Barn owl Stage 3 nest site surveys, Mott MacDonald (2018)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

- Pink modified scheme option
- 1.5km buffer
- No access

Barn owl Stage 3 nest site surveys

- Active Roost Site (ARS)
- Occupied Breeding Site (OBS)
- Potential Nest Site (PNS)
- Temporary Rest Site (TRS)

References drawings

Drawing Status: Suitable for Stage Approval
Suitability: S4

Mott MacDonald Sweco

Stoneham Place
Stoneham Lane
Southampton
SO50 9NW

Tel : +44 (0)23 8062 8800
Fax : +44 (0)23 8062 8801
www.mottmac.com

Client: highways england

Project Title: **A358 Taunton to Southfields**

Drawing Title: Barn owl Stage 3 nest site surveys

Scale	Designed	Drawn	Checked	Approved
NTS	DL	ER	DL	AT

Original Size	Date	Date	Date	Date
A1	19/11/2020	19/11/2020	19/11/2020	19/11/2020

Drawing Number: HE PIN | Originator | Volume
HE551508 - MMSJV - EBD -
000 - DR - LB - 0072
Location | Type | Role | Number

Project Ref. No.: 370774

Revision: P1

Appendix D

Stage 3 PNS survey findings

Table A-1: Stage 3 PNS survey findings

Type	Date	Description	Stage 3 findings
PNS 1	30/08/2017	Derelict barn.	None
PNS 2	31/08/2017	Open barn with hay rick.	None
PNS 3	07/09/2017	Two barns with permanent access points	None
PNS 4	07/09/2017	Two Black Poplar hybrids cavities on W. sides	None
PNS 5	12/09/2017	Two cavities on south-east side of oak 4-5m.	None
PNS 6	12/09/2017	Barn with access hole cut in upper tier door on west side.	None
PNS 7	13/09/2017	Barn with upper floor and entrance space.	None
PNS 8	13/09/2017	Box on ash tree.	Stock dove nest. No barn owl evidence
PNS 9	13/09/2017	Rot out cavity in horse chestnut 3.5m in height.	None
PNS 10	13/09/2017	Cavity on branch in south side of oak.	None
PNS 11	13/09/2017	Cavity in branch on south side of oak.	None
PNS 12	13/09/2017	Cavity in ash tree on river bank10m height.	None
PNS 13	14/09/2017	Derelict house.	None
PNS 14	15/09/2017	Church tower with un-meshed openings.	None
PNS 15	19/09/2017	Barn with missing tiles.	None
PNS 16	28/09/2017	Large cavity in south side of oak.	No barn owl evidence. Little owl current roost. Fresh pellets present.
PNS 17	10/10/2017	Cavities on NW side of ash.	None
PNS 18	11/10/2017	Box in pear tree. Stage 3 on 18/7/18.	None
PNS 19	12/10/2017	Cavity in oak limb 10m high on south side.	No barn owl evidence. Stock dove nest.
PNS 20	24/10/2017	Horse chestnut cavities on east and south sides.	Tree has been removed.
PNS 21	24/10/2017	Cavity in broken branch on east side 8m height.	White wash and white 'downy' feather present. Also cavity on dead branch on south side and cavity down trunk at top. Stage 3 on 30/08/18. East cavity not checked owing to equipment failure. South cavity and central cavity revealed no barn owl evidence. Little owl pellet on top of trunk.
PNS 22	26/10/2017	Cavity in limb on NE side, 3.5m height	None
PNS 23	07/11/2017	Brick barn with missing window pane for potential access.	None
PNS 24	07/11/2017	Cavity on east side ash tree limb 3.5m height.	None
PNS 25	08/11/2017	On south side of dead tree trunk 3m height.	None
PNS 26	08/11/2017	Box in ash tree on east side 6m height.	No barn owl evidence. Occupied concurrently by stock dove and hornet nest.
PNS 27	09/11/2017	Three cavities on S. side of oak.	None
PNS 28	09/11/2017	Cavity in dead oak trunk.	Little owl roost, no barn owl evidence.
PNS 29		Tree needs checking.	No access.
PNS 30	10/11/2017	Box in barn.	No barn owl evidence. pigeon nest.
PNS 32	14/11/2017	Cavity in ash on south side 7m height.	None

Type	Date	Description	Stage 3 findings
PNS 34	22/11/2017	Barn with hay ricks.	None
PNS 35	22/11/2017	Barn with nesting potential.	None
PNS 36	19/07/2018	Box in oak.	Little owl roost, no barn owl evidence.
PNS 37	19/07/2018	Box in oak.	Occupied by nesting stock dove. No barn owl evidence.
PNS 38	24/07/2018	Cavity in ash.	None
PNS 39	31/07/2018	Hollow oak.	None
PNS 40	01/08/2018	Purpose built entry to upper tier of barn.	None
PNS 41	30/08/2018	Rot out on south side of Turkey oak 8m high.	None
PNS 42	30/08/2018	Rot out cavity 3m high on south side.	Stock dove nest. Too shallow for barn owl.