

A358 Taunton to Southfields Dualling Scheme

Ecological Baseline Report – Barn Owl

HE551508-ARP-EBD-ZZ-RP-LE-000009

24 May 2022

Table of contents

	Pages
Executive summary	1
1 Introduction	2
1.1 Purpose and scope of this document	2
1.2 Scheme overview	2
1.3 Study area and zone of influence	3
1.4 Legislation	4
1.5 Status of barn owls at national level	4
1.6 Status of barn owls at county level	5
1.7 Barn owl ecology	5
2 Methodology	7
2.1 Desk study	7
2.2 Field study	7
2.3 Assumptions and limitations	10
3 Results	12
3.1 Desk study	12
3.2 Field survey	13
4 Conclusions	24
Abbreviations List	25
Glossary	25
References	26
Appendices	i
Appendix A Type 1 and type 2 habitat plans	ii
Appendix B Stage 2 and 3 field survey results	iii

Table of Figures

Figure 1-1 Scheme plan	3
Figure A-1 Location and extent of type 1 and type 2 habitat	ii
Figure B-1 Barn owl nesting plan (locations of PNS, ARS, TRS), potential TABs and incidental barn owl records	iii

Table of Tables

Table 3-1 Details of ARS and TRS found within 2021 field survey area	15
Table B-1 PNS features without barn owl evidence between 500 metres and 1.5 kilometres of the scheme – 2017 and 2018 field survey	iv
Table B-2 PNS features without barn owl evidence within 500 metres of the scheme – 2021 field survey	v
Table B-3 Features assessed as not suitable for nesting barn owl within 1.5 kilometres of the scheme (2017, 2018 and 2021 surveys)	xxiii

Executive summary

The A358 Taunton to Southfields Dualling scheme would provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the M5 motorway to the A303 at Ilminster to the south.

Barn owl (*Tyto alba*) surveys were part of the suite of habitat and protected species surveys commissioned in relation to the scheme. This report presents the results of the barn owl surveys and aims to inform the ecology baseline for the scheme.

The objectives of this report are to present the nationally accepted methodologies used, identify survey limitations, present the results of the desk and field surveys and assess the importance of habitats present for barn owl; the results of which will be used to inform appropriate mitigation and enhancement.

All wild birds, their nests and their eggs are protected by the Wildlife & Countryside Act 1981 (as amended). Barn owls are further listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), which affords them additional protection. Listing on Schedule 1 of the Act makes it an offence to intentionally or recklessly disturb birds during nest building, or at a nest containing eggs or young, or to disturb the dependent young of such a bird.

Available, third party, desk study data records confirmed the presence of barn owl within close proximity to the scheme and across the wider landscape.

The field survey comprised 3 stages. Stage 1 was a site walkover to identify features, such as built structures, mature trees and habitats, which might offer potential nest sites, roost sites or foraging habitats for barn owls. Stages 2 and 3 involved a detailed investigation of the features identified during Stage 1 to determine potential nest sites, active roost sites, temporary rest sites and occupied breeding sites.

The only significant limitation to the survey was the lack of access to part of the Hatch Park Estate in Hatch Beauchamp; an area of open farmland and wood pasture with numerous mature trees (mostly oak) of sufficient age and girth to contain a suitable nesting or roosting cavity. There were no other significant limitations to the surveys were noted.

Type 1 habitat (optimum habitat to support field voles) was limited and fragmented within the study area whilst type 2 habitat (sub-optimal for field voles) was more extensive. A total of 26 potential nest sites, four active roost sites and three temporary rest sites were found within the 2021 field survey area. No occupied breeding sites were found within the 2021 field survey area. The four active roost sites were barn structures, whereas one temporary rest site was a barn structure and two were tree cavities. The potential nest sites included a range of tree cavities, nest boxes and buildings.

The A358 carriageway at Capland (the location of a dead barn owl record) had both type 1 and type 2 habitat in the vicinity and was classified as a traffic accident blackspot for barn owls. Other potential traffic accident blackspots for barn owls include a section of the new offline carriageway to the west of Henlade and the new Mattocks Tree Junction and associated road upgrades.

The combination of the desk study information and the 2021 update surveys identified a total of four occupied breeding sites, eight active roost sites, four temporary rest sites and 44 potential nest sites within the 1.5 kilometre study area.

1 Introduction

1.1 Purpose and scope of this document

- 1.1.1 The A358 Taunton to Southfields Dualling 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 M5 motorway to the A303 at Ilminster to the south. Barn owl (*Tyto alba*) surveys were part of the suite of habitat and protected species surveys commissioned in relation to the scheme.
- 1.1.2 This report presents the results of the barn owl surveys and aims to inform the ecology baseline for the scheme.
- 1.1.3 The objectives of this report are to:
- provide details of the methodology, constraints and results of the desk study and field survey
 - determine the presence or absence of barn owls, particularly breeding or roosting barn owl, within the Zone of Influence (Zoi)
 - assess the importance of habitats for barn owl within the Zoi, particularly in relation to habitat connectivity for foraging barn owl
 - identify potential Traffic Accident Blackspots (TABs) for barn owls

1.2 Scheme overview

- 1.2.1 The scheme is part of a programme of improvements planned along the A303/A358 corridor aimed at improving connectivity between London, the south-east and the south-west. The A303, alongside the A30, forms part of the strategic road network (SRN) and together with the A358, provides the link between London, the south-east and the south-west.
- 1.2.2 The programme of improvements, as set out in the Government’s *Road Investment Strategy* [1] made a commitment to, “...upgrade all remaining sections of the A303 between the M3 and the A358 to dual carriageway standard, together with creating a dual carriageway link from M5 at Taunton to the A303”.
- 1.2.3 The scheme directly addresses this long-term commitment and would provide a new rural all-purpose dual carriageway link from the M5 at Taunton to the A303 at Southfields roundabout. The new dual carriageway would comprise new and upgraded stretches of the existing A358 road. Full details of the scheme will be provided in Chapter 2 *The Project* of the Environmental Statement (ES). Please refer to Figure 1-1 for scheme plan.

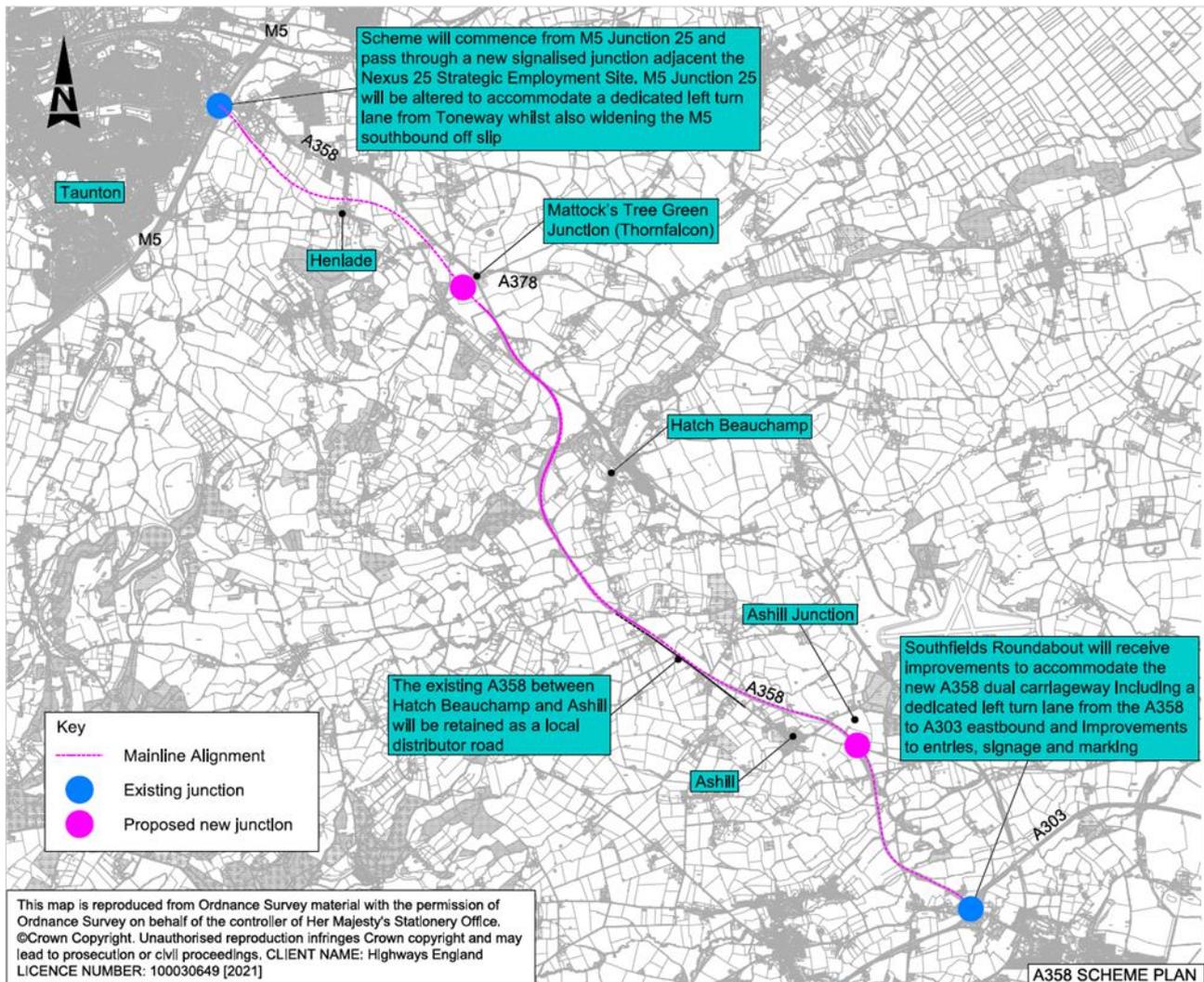


Figure 1-1 Scheme plan

1.3 Study area and zone of influence

1.3.1 The Chartered Institute for Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment* [2] recommend that all potentially important ecological features that occur within the Zol for a scheme are investigated. The Zol includes:

- areas to be directly within the land take for the scheme
- areas that would be temporarily affected during construction
- areas likely to be impacted by hydrological disruption
- areas where barn owls rely on habitat connectivity to or across the scheme
- areas where there is a risk of pollution and noise disturbance during construction and/or operation

1.3.2 The Zol for barn owls can vary depending on potential impacts and habitat suitability, but for transport scheme developments the Zol is generally considered to be all areas within 1.5 kilometres of the scheme boundary [3]. This takes into account:

- the distance barn owl will commonly range from their breeding sites for foraging purposes
- habitat suitability within the vicinity of the scheme

- current location of and associated disturbance from the existing A358

1.3.3 This Zol is hereafter referred to as the study area.

1.4 Legislation

1.4.1 A framework of international, European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This legislation will be listed in full within Chapter 8 *Biodiversity* of the ES. Legislation relevant to and discussed within this report are:

- Wildlife and Countryside Act 1981

1.4.2 All wild birds, their nests and their eggs are protected by the Wildlife and Countryside Act 1981. Offences under the 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

1.4.3 Barn owls are further listed on Schedule 1 of the Wildlife and Countryside Act 1981, which affords them additional protection. Listing on Schedule 1 of the Act makes it an offence to intentionally or recklessly disturb birds during nest building, or at a nest containing eggs or young, or to disturb the dependent young of such a bird.

1.5 Status of barn owls at national level

1.5.1 Following a major decline throughout the 20th Century, the UK barn owl population has stabilised and started to expand [4]. Barn owls in recent decades have a wide breeding distribution, occurring as far north as Sutherland and Caithness in Scotland. Historically barn owls were birds of lowland counties, and it is within eastern and southern England that they are still found at the highest densities. They are found in low densities in upland areas and the most northerly regions as they are susceptible to wet and cold winters characteristic of such areas [5].

1.5.2 The UK population has been estimated to be between 3,000 and 5,000 breeding pairs [4]. A more recent assessment by the Rare Breeding Birds Panel [6] shows the number of pairs has increased by four and a half times between 1996 and 2005 and is no longer considered to be a rare breeding bird in the UK. The barn owl was amber listed on the *Birds of Conservation Concern* [7] but was moved to the UK green list in 2015 due to its range expansion and population recovery. This recovery is likely down to concerted efforts by conservation groups and landowners to manage barn owl foraging habitat and the provision of specialised nest boxes [4] [5].

1.5.3 Several factors have been noted for the historic decline in barn owl numbers and distribution [4] [5]:

- Loss of foraging habitat due to the intensification of agricultural practices.
- Loss of nesting and roosting sites through conversion of old farm buildings and loss of mature trees from hedgerow removal and Dutch Elm disease.
- An increase in deaths resulting from collisions with road traffic.

- Poisoning, primarily from rodenticides and organochlorine pesticides such as DDT.

1.6 Status of barn owls at county level

- 1.6.1 Barn owl is not listed in the Somerset Biodiversity Action Plan and is likely to be widespread within the county given the prevalence of open habitats within a largely rural landscape, aligning with preferred barn owl habitat.
- 1.6.2 Whilst outside of the implementation period, it should be noted that the *Somerset Highways Biodiversity Manual* [8] recommends due consideration is given to reducing barn owl mortality on the road network through discouraging the creation of optimal foraging habitat in the verge by tree/scrub removal and thinning.

1.7 Barn owl ecology

- 1.7.1 Barn owls, although found across Britain, 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 and breeding birds are faithful to sites [5].
- 1.7.2 The extent and shape of a home range can vary considerably with most barn owl activity within 1 to 2 kilometres of the nest site during the breeding season, although they may range up to 4 kilometres. In winter, foraging range can increase up to 3 to 6 kilometres from nest sites [5].
- 1.7.3 Within a home range a pair of barn owls may have one nesting site, up to four regular roost sites, and any number that they may visit on an occasional basis [5]. Roost and nest sites are most commonly found in buildings, purpose-built nest boxes and tree cavities.
- 1.7.4 Barn owls hunt predominantly 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 the previous night. Breeding success is strongly linked to the fluctuations in the availability of field voles (*Microtus agrestis*), their favoured prey. Field voles, and other prey species, are strongly associated with areas of extensive rough grassland with a well-developed sward structure. Young conifer plantations, riverbanks and arable field margins can also support hunting barn owls.
- 1.7.5 Barn owls are particularly vulnerable to collision with vehicles. Their low wing-loading and fragility of flight reduces their ability to avoid fast moving traffic and this, combined with their habit of flying at low level whilst crossing roads and commuting along grass verges, makes them especially vulnerable. Whilst they are known to fly at a height of three to six metres above the ground when commuting, they will usually fly at a height below three metres when foraging. The combination of suitable foraging habitats along roadsides and this low flight height can result in high mortality rates caused by collisions with vehicles.
- 1.7.6 It is estimated that 3,375 individuals are killed on major roads in the UK each year [9], accounting for at least 50% of known barn owl mortality [10]. Major roads can result in the complete absence of breeding barn owls within 500 metres of a road and it is not until 25 kilometres from a major road that its effect on barn owl populations cannot be detected [11].

- 1.7.7 Barn owls have difficulty in avoiding collision with traffic moving faster than 50mph and thus the greatest levels of mortality occur on major roads where traffic typically moves at such speed. The particular rates of mortality relate to the speed and volume of traffic as well as the population density of barn owl in the area concerned.

2 Methodology

2.1 Desk study

2.1.1 A detailed desk study was undertaken to identify the likely status of barn owls within the vicinity of the scheme. Information on barn owl records, suitable foraging habitat, potential/confirmed nest sites and roost/resting sites was gathered from the following sources:

- A detailed biological records search was requested from the Somerset Environmental Records Centre (SERC) in February 2021. This was used to identify records of barn owl (from 2011 onwards) within a 2 kilometre radius of the scheme.
- A review of the *A358 Taunton to Southfields Dualling Barn Owl Survey Technical Report (March 2021)* [12] for previously recorded foraging habitats and nesting sites (surveyed in 2017 and 2018) 1.5 kilometres of the scheme. A review of the Ecological Baseline Report – UK Habitat Classification [13] for suitable foraging habitat and potential nesting features within the study area.

2.1.2 Barn owl features identified using the *A358 Taunton to Southfields Dualling Barn Owl Survey Technical Report (March 2021)* [12] are only reported to 1.5 kilometres from the current scheme. Features identified beyond this were discounted for the purposes of this report.

2.1.3 Desk study information on any potential foraging habitat, barn owl records and potential/confirmed nest/roost sites identified within the study area were used as part of the stage 1 assessment (see below) and to inform the field surveys and assessment.

2.2 Field study

2.2.1 Based on the availability of extensive, recent survey data within the 1.5 kilometre study area [12], and the fact that barn owls are largely sedentary and faithful to nesting and roosting locations [5], a reduced field survey area of 500 metres was agreed for the 2021 update baseline surveys in consultation with Natural England.

2.2.2 The 2021 field surveys aimed to:

- verify features identified during previous surveys
- gather data from areas where access was previously not granted
- identify any new barn owl features or any alterations to baseline conditions that could potentially impact barn owls

2.2.3 Field surveys followed the methodology set out in the *Barn Owl Survey Methodology and Techniques for use in Ecological Assessment* [3]. As such, field surveys took a three-stage approach:

- Stage 1 – site walkover to broadly establish and record those features, such as built structures, mature trees and habitats, which on later more detailed inspection (during the Stage 2 Survey) might offer potential nest sites, roost sites or foraging habitats for barn owls.
- Stage 2 – a detailed investigation of the features identified during Stage 1 to record features that may act as potential nest sites (PNS), active roost sites (ARS), temporary rest sites (TRS).

- Stage 3 – investigation of internal cavities identified during the barn owl breeding season to confirm the presence of an occupied breeding site (OBS).

2.2.4 Stage 2 and stage 3 surveys were carried out concurrently.

2.2.5 Evidence of mortality, activity and relevant contextual information was also gathered from landowner interviews and incidental sightings recorded during other baseline ecology surveys (particularly nocturnal bat surveys). These records were used to identify potential barn owl dispersal and foraging routes, and to define TABs [3].

Stage 1 survey

2.2.6 In combination with the desk study information, stage 1 field surveys during 2021 included a walkover of land within 500 metres of the scheme boundary to assess suitability of habitats for supporting barn owl food resources (predominantly field vole and other small mammals). Habitats were defined by type and structural composition and were classified as the following:

- Type 1 habitat – optimum habitat to support field voles (barn owl prey); usually permanent unimproved or semi-natural grassland with varied, tussocky structure, and a thatch layer at least 30mm deep. Management is absent or occasional grazing only.
- Type 2 habitat – sub-optimal to field voles, so only 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.
- Type 3 habitat – very poor habitat for field voles and other small mammals; includes 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 – non-grassland habitats such as arable fields and mature woodland which offer little or no value for foraging barn owls.

2.2.7 Locations of potential roost/nest sites were identified by recording suitable built structures and mature trees across the site. Built structures included any suitable agricultural buildings located within the study area.

2.2.8 The location of mature trees, either standing prominently in fields or along hedgerows/woodland edges, were also scoped in during the stage 1 survey. Such mature trees followed the guidance provided by Shawyer (2012) [3] which states that the trunk diameter at chest height should generally conform to the following:

- Ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and crack willow (*Salix fragilis*) – 0.5 metre diameter or greater.
- Horse chestnut (*Aesculus hippocastanum*), beech (*Fagus sylvatica*) – 0.75 metre diameter or greater.
- English oak (*Quercus robur*) – 1.5 metre diameter or greater.

Stage 2 and stage 3 surveys

- 2.2.9 All stage 2 and 3 surveys were led by experienced surveyors holding a Natural England CL29 class licence for disturbance (Jacob Haddon and Gwen Brassine). Both surveyors have experience conducting barn owl surveys on major infrastructure projects, including highways schemes.
- 2.2.10 Combined stage 2 and stage 3 surveys aimed to confirm/reassess the status of all accessible barn owl features within the 500 metre study area identified from the desk study and stage 1 surveys.
- 2.2.11 PNS sites are those sites which possess a cavity of at least 80mm diameter, or a vertical slot of this width backed by a sufficiently large and dark chamber with a floor area greater than 250mm x 250 mm, as advised by Shawyer (2012) [3]. Such PNS sites, relevant to the study area, include:
- 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.
 - Mature trees, isolated or in clusters in open fields, hedgerow or on the woodland edge, containing a hole >80mm backed by a large, dark cavity, including those which have rotted-out to ground level but which offer no obvious access to ground predators through an open root structure.
 - Outdoor nest boxes on poles, trees or buildings.
 - Outdoor bale-stacks.
 - Waterway, rail or road bridges containing suitable cavities within their structure.
- 2.2.12 Mature trees located in open fields, hedgerows and woodland edges, that contained nesting or roosting features potentially suitable for barn owls were initially inspected from ground level. Other trees in suitable habitat which were considered to be of sufficient age and girth to contain a cavity, along with trees that showed signs of damage or decay from wind or lightning strike were also examined, initially from ground level. Where possible, tree holes (with a minimum diameter of 80mm, which is a sufficient size for barn owl to access) and cavities within trees were then accessed (using a ladder if necessary) and inspected for evidence of barn owls with the aid of a torch and mirror or endoscope. This inspection enabled the surveyor to determine whether the cavity was large enough to accommodate an adult barn owl and included a search for barn owl field signs that might indicate its current or past use as a nest or roost site. Agricultural buildings, bale stacks and other structures were investigated in a similar way, from ground level and using ladders (if possible and appropriate), torches and endoscopes.
- 2.2.13 Field signs noted included whitewash (droppings), pellets, and moulted feathers. Searches were also undertaken for evidence of breeding including the presence of barn owl eggs, eggshells, chicks, chick down and nest material.
- 2.2.14 All accessible built structures and mature trees recorded in the stage 1 survey were carefully inspected to determine their status. Surveys were undertaken from mid-June onwards, when evidence of breeding barn owls is likely to be most

conspicuous, and nest abandonment caused by disturbance is unlikely [3].

Surveys were undertaken on:

- 8 and 9 June 2021
- 22 and 23 June 2021
- 29, 30 June and 1 July 2021
- 13 and 14 July 2021 – two teams concurrently
- 8 September 2021

2.2.15 Two paired derelict residential buildings located along Station Road, west of Ilminster were deemed too dangerous to inspect internally. Therefore, a dusk emergence survey was carried out on 2 August 2021, by four surveyors (Jacob Haddon, Daniel Hulmes, Alys Black, Marie Fleming) stationed around each aspect of the structures. The survey commenced 30 minutes prior to sunset (20:57) and ended 90 minutes following.

2.2.16 Where possible, landowners were also interviewed to obtain any anecdotal evidence of barn owl presence within the landscape.

2.2.17 Additional barn owl foraging habitat was recorded during these visits, classified in accordance with criteria listed in 2.2.4.

2.3 Assumptions and limitations

2.3.1 Whilst barn owls are largely sedentary and faithful to nesting and roosting locations [5], it is recognised that changes in the use of a landscape by barn owls can occur. Loss of barn owls from an area may result from loss or degradation of nest and roost sites, changes in foraging habitat availability, or increased mortality of individuals. However, barn owls may also occupy previously unoccupied areas if conditions become increasingly favourable, through increased availability of new nest/roosting sites and foraging habitat, provided there are sources of colonisation from occupied adjacent home ranges. For the purposes of this report, it has been assumed that features identified between 500 metres and 1.5 kilometres remain in the same status as identified during 2017 and 2018 [12], whereas features located within 500 metres of the scheme have been subject to updated survey in 2021. This approach was agreed with Natural England.

2.3.2 Access was denied to part of the Hatch Park Estate in Hatch Beauchamp. This area contains open farmland and wood pasture, which was viewed with binoculars from the adjacent land. Numerous mature trees (mostly oak) of sufficient age and girth to contain a suitable nesting or roosting cavity, as well as signs of damage or decay, were visible within this area. Given the superficial suitability to support nesting or roosting barn owl, lack of inspection for these features is considered to be a significant limitation to the identification and survey of PNS in this area. However, the lack of access to part of the Hatch Park Estate is not considered to present a significant limitation to the overall assessment of the scheme impacts on the local barn owl population.

2.3.3 Access was denied to some smaller residential properties although these were considered unlikely to support nesting barn owl, and therefore was not considered a significant limitation.

2.3.4 Several PNS displayed features (PNS17, 47, 48, 51, 58, 59, 61, 64) which could not be assessed for stage 3 surveys due to safety concerns. Such features were generally identified at height on mature trees which are less likely to contain

cavities of sufficient size to support barn owl, due to the smaller branch/trunk size. A thorough inspection for external field signs was undertaken and landowners interviewed for anecdotal evidence in these instances, with the limitation to survey noted. Any features for which the stage 3 survey was not undertaken remained recorded as PNS on a precautionary basis as presence/absence could not be confirmed.

- 2.3.5 One structure, a timber clad farm outbuilding at Capland (PNS53), was not viable for interior access, with the interior of the building viewed only through the window. Droppings were viewed in the main barn but the roof void itself was sealed off. A bat emergence survey was conducted prior to and following dusk on this structure on the 25 June using infra-red cameras covering each face of the building. No barn owl activity was recorded, and this is therefore not considered to constitute an OBS, but remains a PNS on a precautionary basis.
- 2.3.6 Several features were identified with suitability to act as roosting sites, with anecdotal evidence to support this, but where evidence had likely been destroyed:
- TRS3 is a stone outbuilding with several wooden roof beams used to shelter cattle, with the earth floor trampled, though seemingly not recently. The farmer confirmed that the building has historically been used as a roost but had not seen birds during 2021, with several other adjacent landowners also confirming this.
 - ARS7 is an extensive metal barn utilised as a workshop and for keeping fowl. A single metal beam offers roosting opportunity. The landowner reported regular pellets beneath the beam and a single highly degraded pellet (30+ months) was recovered from the roof of a container beneath this beam, preventing it from being swept away.
 - ARS8 is a corrugated metal workshop, with several wooden roof beams. The landowner reported frequent use by barn owl, including describing numerous pellets and whitewash which they had recently cleaned away when clearing the workshop.
- 2.3.7 Given the strong anecdotal evidence and probable destruction of evidence, each of these features are precautionarily classified as TRS or ARS.
- 2.3.8 The derelict buildings detailed in 2.2.14 were subject to a dusk emergence survey due to safety concerns of an internal inspection. Whilst a negative result was returned the structures remain recorded as a PNS, as it is considered likely that the interior of the structures offers suitable nesting opportunities.

3 Results

3.1 Desk study

3.1.1 The SERC data search returned 11 relevant records, summarised below:

- A single record from the area surrounding junction 25 of the M5 at the northern extent of the scheme, dating from 2015.
- A single record from the Creech St Michael area approximately 1.5 kilometres north-east of the scheme, dating from 2014.
- A single record from the Henlade area at the northern extent of the scheme, dating from 2014.
- A single record from the Wrantage area approximately 1.5 kilometres east of the scheme, dating from 2014.
- Two records from the Thurlbear area approximately 2 kilometres west of the scheme, each dating from 2012.
- A single record from the Bickenhall area approximately 1.5 kilometres west of the scheme, dating from 2014 and relating to four juvenile birds.
- A single record from the Horton Green area at the southern extent of the scheme, dating from 2014.
- A single record from the Donyatt area south of the scheme, dating from 2012 and relating to a single adult bird.
- Two records from the Ilminster area south of the scheme, dating from 2014 and 2015 respectively.

3.1.2 The landscape within the 1.5 kilometre study area predominantly comprised a mixture of arable farmland and grazed pasture, though with several urban areas and significant woodlands. Areas of type 1 and type 2 habitat were identified across the length of the scheme as shown in Appendix A Type 1 and type 2 habitat plans.

3.1.3 Notable locations of suitable foraging habitat included:

- large areas of mixed type 1 and type 2 habitat south of the River Tone between Henlade and Ham
- grazed fields of predominantly type 2 surrounding all aspects of Stoke Wood
- extensive areas of type 2 mixed with more restricted type 1 to the west and south of Hatch Beauchamp
- several large fields of type 1 and type 2 south of Bickenhall
- extensive areas of type 2 north of Stewley
- extensive type 1 north of Ashill Wood/Every's Copse; bound by Venner's Water and linear woodland and immediately south of the airfield
- significant areas of mixed type 1 and type 2 south of the A303, largely associated with the River Isle

3.1.4 The desk study identified four OBS, four ARS and one TRS within the 1.5 kilometre study area [12]. Each of these OBS, ARS and TRS were located outside of the 500 metre 2021 field survey area. Details and locations summarised below.

3.1.5 The OBS, ARS and TRS were:

- OBS1 – nest box located on the north side of an oak in a hedgerow near Haddons Farm east of Huish Woods. A long-term nest site, Hawk and Owl Trust box number 1361. A barn owl flew from the box when approached.
- OBS2 – nest box on a hedgerow tree between Hastings and Southtown. The box had been in use for several years with three juveniles present at the time of survey.
- OBS3 – nest box located on a hedgerow tree near Myrtle Farm north of New Town. Four juveniles were present at the time of survey.
- OBS4 – nest box located 6m high on a hedgerow oak tree north of Puddlebridge. A barn owl flew from box when approached. Two chicks were ringed in the nest in 2018.
- ARS1 – small open fronted stone barn north of Broadway Pound. 50+ pellets below beam, all over six months old. Several feathers also present.
- ARS2 - A ledge inside a rotten trunk on the south side of a tree, located east of Hatch Beauchamp. A moulted primary feather and thirty pellets (some less than six months old) were found inside.
- ARS3 – A barn with a broken wood panel on the exterior, near Wood. Over forty pellets including one very fresh (one day old) were present. Numerous body feathers and three male secondary feathers also found.
- ARS5 – Small cavity in 10m high branch on south side of an oak tree, located east of Hatch Beauchamp. 18 pellets found below the tree, several less than a month old. No evidence was found within the tree.
- TRS1 – Oak tree, located east of Hatch Beauchamp, with six pellets found beneath. All older than one month. No sign of any cavity.

3.1.6 Twenty-six PNS were identified within the 1.5 kilometre study area. Of these, eight PNS were located within 500 metres of the scheme and were therefore resurveyed in 2021. The locations and details of the 18 PNS located between 500 metres 1.5 kilometres of the scheme are provided in Appendix B Table B-1.

3.1.7 All OBS, ARS, TRS and PNS are shown in Appendix B Stage 2 and 3 field survey results.

3.2 Field survey

Stage 1

3.2.1 The landscape within the 500 metre field survey area predominantly comprised a mixture of arable farmland and grazed pasture. Areas of type 1 and type 2 habitat were identified across the length of the scheme as shown in Appendix A Type 1 and type 2 habitat plans.

3.2.2 Type 1 habitat was only occasionally encountered within the study area. Areas of this habitat type were identified throughout the scheme, but such areas were largely fragmented and limited in extent. Notable locations of type 1 foraging habitat included:

- Immediately north of the A358 between Ruishton and Henlade, including the grounds of an abandoned hotel and a set aside area with mixed scrub.
- A small meadow surrounded by grazing land (type 2) west of Henlade.
- South of Thornfalcon, including habitat surrounding an ornamental lake and an area of set aside in the adjoining field.
- Two abandoned fields south-west of Meare's Green.
- Amongst young plantation adjacent to the A358 west of Hatch Park.

- Three large fields north of the A358 at Capland, one of which lies immediately adjacent to the A358.
- Two fields east of Ashill, including a seemingly abandoned orchard.

3.2.3 Type 2 habitat was encountered more extensively within the study area, usually due to fields being managed through periodic grazing by cattle or horses, or through hay topping. Significant areas of contiguous type 2 habitat were present in grazing land west of Henlade, interspersed with type 1 habitat surrounding Capland and west of Ashill, as well as at the southern extent of the study area, particularly associated with the floodplain of the River Isle.

Stage 2 & 3

3.2.4 A total of 33 PNS, ARS and TRS were identified within the study area. The locations of these ARS, TRS and PNS are shown in Appendix B Stage 2 and 3 field survey results, and detailed descriptions of the PNS are provided in Table B-2, Appendix B Stage 2 and 3 field survey results.

3.2.5 No OBS were identified within the 500 metre survey area in 2021.

3.2.6 A total of four ARS and three TRS were found within the 500 metre study area. Details of all roosting sites can be seen in Table 3-1 below.

3.2.7 TRS1 was identified as an extensive hollow within a pollarded oak. The cavity is dry and of suitable dimensions for breeding. Numerous small mammal bones were identified within the thick debris of the cavity, presumed to originate from highly degraded barn owl pellets. Female barn owl can create a cushion of shredded pellets in the base of a nest cavity on which to lay eggs [3]. The spread of mammal bones over the base of this cavity may indicate shredding by a female barn owl in the past, therefore making this feature a historically used nest site. Given the degradation and age of evidence however, this feature is classified as a TRS.

Table 3-1 Details of ARS and TRS found within 2021 field survey area

Feature	Type	Description	Date surveyed	Photos
ARS6	Dutch barn located west of Haydon.	<p>Open Dutch barn with limited agricultural use indicated by piles of debris. No nesting opportunities but posts at 4m height offer perching points.</p> <p>Nineteen visible pellets, mostly atop debris pile at southern end of barn below roost perch. Pellets varying in age from several weeks old to several years, potential for many more to have fallen through debris pile. Whitewash present on and below perching point.</p>	01/07/2021	

Feature	Type	Description	Date surveyed	Photos
ARS7	Large modern barn complex	<p>A single degraded pellet (several years) was found on top of a container roof. Landowner described pellets perfectly and claims to have swept up such evidence on a regular basis. Kestrel pellet also found.</p> <p>Metal beam at front of barn is the only suitable roosting location.</p>	14/07/2021	
ARS8	Corrugated metal workshop	<p>Open-fronted barn with mezzanine.</p> <p>Landowners claim to have seen barn owls using the barn, and accurately described pellets and whitewash, which was cleaned prior to the survey. Low wooded beams offer suitable perches for roosting only.</p>	22/06/2021	

Feature	Type	Description	Date surveyed	Photos
ARS9	Derelict barn	<p>Set of stone barns in some disrepair, previously used for storage, now seemingly unused. Lots of beams for roosting, several with pellets beneath. Only possible nesting location is on the floor of the upper level, approximately 2 metres from the ground. However, somewhat exposed and appears to be historically used by jackdaw.</p> <p>Eight pellets were identified all in various stages of disintegration (approximately one month old to several years). An unidentifiable chick carcass, likely jackdaw, was also identified indicating a previous nesting attempt by this species.</p>	29/06/2021	

Feature	Type	Description	Date surveyed	Photos
				

Feature	Type	Description	Date surveyed	Photos	
TRS2/ potential historic nest site	Extensive cavity in oak	<p>Large dry cavity in main trunk of pollarded standard oak in cattle grazed field.</p> <p>Numerous small mammal bones within cavity debris indicating historic use by barn owl, possible shredded pellet material indicative of a historic nesting attempt.</p>	14/07/2021		
TRS3	Derelict cattle shelter	<p>No nesting opportunities but cross beams provide suitable roosting features. Both landowner and neighbours report seeing barn owl using the structure for roosting, although not recently. Any historic evidence likely to have been trampled by cattle.</p>	29/06/2021		

Feature	Type	Description	Date surveyed	Photos	
TRS4	Pedunculate oak with multiple cavities, located in Jordan's Park, north of Ilminster.	<p>Three entrances around 4m high all checked – none extending far enough to constitute a PNS.</p> <p>Four highly degraded barn owl pellets and two kestrel pellets under north-facing limb. Whitewash also present. Twisted limb at 10m could not be checked.</p>	09/06/2021		

- 3.2.8 No barn owl activity was recorded during the dusk emergence undertaken on the two derelict buildings on 2 August 2021. These buildings were not, therefore, considered be an OBS, but still represent a PNS.
- 3.2.9 Twenty-six PNS were identified throughout the 2021 field survey area and were varied in their nature. Descriptions and photographs of each are provided in Appendix B Table B-2 Stage 2 and 3 field survey results.
- 3.2.10 Numerous highly mature trees with cavities were identified as PNS, primarily ash and oak as well as a single willow (*Salix spp.*). Suitable nesting features associated with trees included purpose-built nest boxes, cracked off limbs, trunks hollowed to base, as well as hollows resulting from historic pollarding. Several trees were deemed unsuitable as PNS upon stage 3 inspection, including superficial features not forming cavities, damp pools within cavities, and exposure to elements. These features are also highlighted in Table B-2, Appendix B Stage 2 and 3 field survey results.
- 3.2.11 Numerous buildings were also identified as PNS, which again varied in their structure and use. Several more modern barns were identified as PNS, generally expansive structures with metal roofs, occasionally Dutch barns. Whilst such buildings generally do not offer suitable roosting or nesting opportunities as part of their structure, several included suitable internal features such as purpose-built nest boxes, stacked pallets or stacked hay bales. More traditional farm buildings were also identified with potential to act as PNS, including a mixture of stone and wooden structures in varying states of maintenance. Flat surfaces with the potential to support nesting were frequently inbuilt within these structures, generally within the roof void where suitable access was present. One building north of West Hatch contained a purpose-built roof void and entrance, though this has been utilised by jackdaw (*Corvus monedula*) in recent years. The two derelict residential properties at the southern extent of the study area contained suitable access through large gaps in the roof tiling and are considered likely to have numerous flat surfaces suitable for nesting within the interior.
- 3.2.12 Three features identified as PNS during the desk study, all at the northern extent of the study area around Henlade, were found not to constitute PNS:
- A cavity identified within an ash tree was found to be superficial and did not offer suitable roosting or nesting opportunities (NS2).
 - A low concrete garage that did not have any suitable nesting ledges or perching locations upon internal inspection (NS3).
 - A highly mature ash tree that had been recently felled (NS4).
- 3.2.13 Evidence of other cavity nesting species was identified over the course of the surveys, including little owl (*Athene noctua*), kestrel (*Falco tinnunculus*), jackdaw, stock dove (*Columba oenas*) and grey squirrel (*Sciurus carolinensis*). Jackdaws in particular, were prevalent throughout the study area. Many features considered suitable for barn owl were occupied by jackdaws, particularly within highly mature trees in Jordans Park Local Wildlife Site and immediately to the east of this site, as well as within buildings and nest boxes purpose-built for barn owl.
- 3.2.14 Most of the A358 verges were vegetated with plantation woodland or scrub habitats, fronted by a thin strip of amenity grassland. However, there were areas where the verge was not wooded. In such areas it is possible that barn owl might either utilise the verge for foraging or to cross the existing A358 at a lower height.

- 3.2.15 A dead barn owl was noted adjacent to the A358 carriageway on the 2 September 2021 at Capland, shown in Figure B-1, Appendix B Stage 2 and 3 field survey results. Whilst it was not possible to recover the corpse for safety reasons, given the location and timing, this was likely to be a dispersing juvenile bird that had died as the result of a traffic collision. It is notable that there are large patches of type 2 foraging habitat, interspersed with type 1, immediately north of this location, including a patch of type 1 immediately adjacent to the location. A barn owl pellet was anecdotally recorded beneath a tree without a cavity just north of this location, also in September 2021. Roosting in trees without cavities is characteristic of dispersing juveniles [5] and further supports the likelihood of the deceased bird being a juvenile. This area was consequently classified as a TAB.
- 3.2.16 As well as significant areas of foraging habitat, the area surrounding Capland and Stewley contained multiple PNS, including PNS53, which had limited survey, as well as ARS8, TRS2 (potential historic nest site) and TRS3. When conducting stage 2 and 3 surveys, several residents in the Stewley area reported regular sightings of barn owl. As juvenile dispersal is generally incremental [5] and there is evidence of barn owl utilising an area with extensive foraging habitat, it may be assumed that an OBS is present in the wider area beyond the 500 metre study area.
- 3.2.17 Three further incidental records of barn owl activity were obtained from nocturnal bat surveys undertaken in 2022:
- A record of a barn owl crossing the A358 south of Thickthorn Lane on 17 June – crossing at a break in roadside vegetation created by farm access tracks directly off the A358 on each side of the road.
 - A record of a barn owl flying over a house on Griffin Lane west of the A358 on 22 June.
 - A record of a barn owl foraging low over field margins east of the A358 at West Hatch on 24 June, before commuting along a hedgerow north-east away from the A358.
- 3.2.18 Given the timing of each of these records, it is considered highly likely that each constitutes an adult bird. As this period coincides with the period of maximum prey delivery to nestlings, it is possible that the incidental records relate to breeding adults with nests in the wider landscape.
- 3.2.19 Given the incidental record of the bird seen crossing the existing A358 near Thickthorn Lane, the presence of a several roosts in close proximity to the road (TRS4, ARS9) and breeding site OBS4 in the wider landscape, the open sections of the A358 in the southern section have been identified as a TAB.
- 3.2.20 Although there were fewer field signs in the northern extent of the scheme, west of Henlade and south of the existing A358 there were several large fields of type 2 foraging habitat and some limited type 1 habitat. The presence of ARS6 shows that barn owl utilise this broad area, despite the lack of suitable nesting features identified. ARS1 is located approximately 850 metres south of the existing A358. The scheme will be several hundred metres closer to ARS6 and will sever the recorded foraging habitat. It is considered that this area could become a TAB following construction of the scheme.
- 3.2.21 Further anecdotal evidence highlights the presence of barn owl crossing the A358 at the Mattocks Tree Hill area, where there is type 1 habitat located adjacent to the existing A358. OBS1, identified in the desk study, lies south of this area,

where the Mattocks Tree junction and associated road upgrades are to be located. This area of the scheme could also become a TAB. Potential TAB areas are shown in Figure B1, Appendix B Stage 2 and 3 field survey results.

4 Conclusions

- 4.1.1 The desk study returned 11 records of barn owl (from SERC) within a 2 kilometre radius of the scheme, and four OBS, four ARS and one TRS were identified within the 1.5 kilometre radius of the scheme. However, all of these previously identified OBS, ARS and TRS were located outside of the 500 metre study area. The desk study identified 26 PNS within the 1.5 kilometre study area, of which 8 were located within 500 metres of the scheme and were therefore subject to update stage 3 surveys in 2021.
- 4.1.2 Type 1 habitat (optimum habitat to support field voles) was limited and fragmented within the 1.5 kilometre study area. Such habitat included land north of the A358 between Ruishton and Henlade, a small meadow surrounded by grazing land (type 2 habitat) west of Henlade, two abandoned fields south-west of Meare's Green, three large fields north of the A358 at Capland, several large fields north of Ashill Wood/Every's Copse and two fields east of Ashill, including a seemingly abandoned orchard. Type 2 habitat (sub-optimal for field voles) was more extensive throughout the study area; significant areas included grazing land west of Henlade, surrounding Stoke Wood interspersed with type 1 habitat surrounding Capland and west of Ashill, as well as at the southern extent of the study area, particularly associated with the floodplain of the River Isle.
- 4.1.3 A total of 26 potential nest sites, four active roost sites and three temporary rest sites were found within the 500 metre field survey area. No occupied breeding sites were found within the 500 metre study area. The four active roost sites were barn structures, whereas one temporary rest site was a barn structure and two were tree cavities. One of the TRS located in a tree may also constitute a historically used nest site based on degraded evidence. The potential nest sites included a range of tree cavities, nest boxes and buildings.
- 4.1.4 The A358 carriageway at Capland (location of an incidental dead barn owl record) had both type 1 and type 2 habitat in the vicinity and was classified as a TAB for barn owls. Other potential TABs for barn owls include the open locations in the south of the scheme where a barn owl was recorded crossing the A358, a section of the new offline carriageway to the west of Henlade (which would sever the habitat corridor between ARS6 and type 1 and type 2 habitat), and the new Mattocks Tree Junction and associated road upgrades, which would sever habitat corridors between a previously recorded OBS (desk study OBS1) and type 1 and type 2 habitat located adjacent to the existing A358.
- 4.1.5 The combination of the desk study information and the 2021 update surveys identified a total of four OBS, eight ARS, four TRS and 44 PNS within the 1.5 kilometre radius of the scheme.

Abbreviations List

Please refer to ES Report Chapter 17 Abbreviations

Glossary

Please refer to ES Report Chapter 18 Glossary

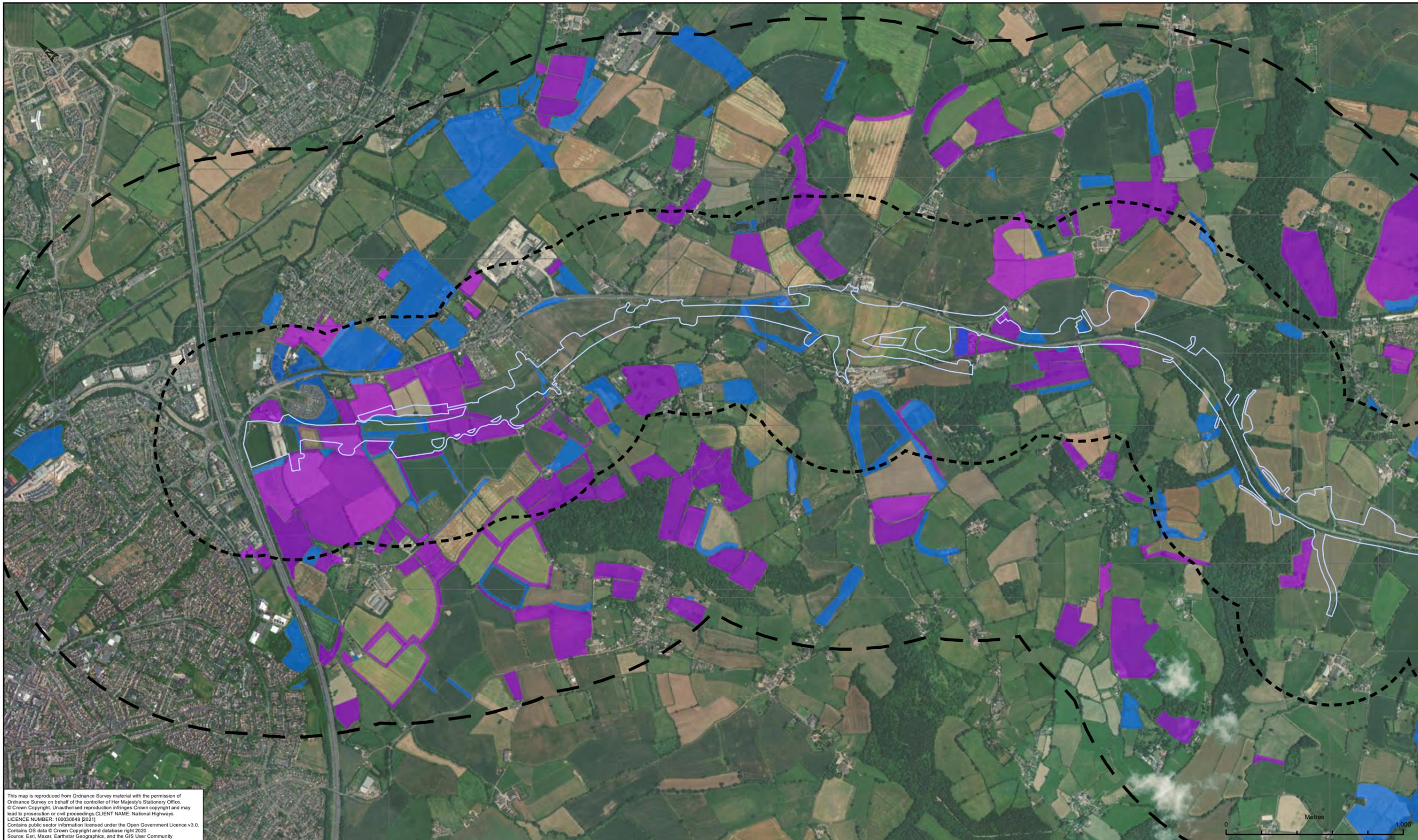
References

- [1] Department for Transport, "Road investment strategy: 2015 to 2020," March 2015. [Online]. Available: <https://www.gov.uk/government/publications/road-investment-strategy-for-the-2010-to-2020-road-period>. [Accessed January 2021].
- [2] "Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, freshwater, coastal and marine version 1.1," Chartered Institute for Ecology and Environmental Management, Winchester, 2018.
- [3] C. Shawyer, "Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment," Wildlife Conservation Partnership, 2012.
- [4] M.P. Toms, H.Q.P. Crick and C.R. Shawyer, "The status of breeding Barn Owls *Tyto alba* in the United Kingdom 1995-7," *Bird Study* 48, pp. 23-37, 2001.
- [5] Barn Owl Trust, "Barn Owl Conservation Handbook," Pelagic Publishing, Exeter, 2012.
- [6] M. Holling and Rare Breeding Birds Panel, "Rare breeding birds in the United Kingdom in 2005," *British Birds: 101*, pp. 276-316, 2008.
- [7] M.A. Eaton, N.J. Aebischer, A.F. Brown, R. Hearn, L. Lock, A.J. Musgrove, D.G. Noble, D. Stroud and R. Gregory, "Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man," *British Birds* 108, pp. 708-746, 2015.
- [8] Somerset County Council, "Somerset Highways Biodiversity Manual 2015-2020," 2015. [Online]. Available: <https://www.travelsomerset.co.uk/wp-content/uploads/2018/05/Somerset-Highways-Biodiversity-Manual-v5.pdf>. [Accessed October 2021].
- [9] C. Shawyer and N. Dixon, "Impact of Roads on Barn Owl *Tyto alba* Populations DPU 9/5/12," Highways Agency, 1999.
- [10] I. Newton, I. Wyllie and L. Dale, "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 Symp.*" 1997.
- [11] D. J. Ramsden, "Barn Owls and Major Roads: results and recommendations from a 15-year research project.," The Barn Owl Trust, Ashburton, 2003.
- [12] Highways England, "A358 Taunton to Southfields Dualling Scheme Preliminary Environmental Information Report, chapter 8: Appendix 8.13," Highways England, 2021.
- [13] National Highways, "A358 Taunton to Southfields Dualling Scheme Environmental Statement, chapter 8: Appendix 8.1," National Highways, 2022.

Appendices

Appendix A Type 1 and type 2 habitat plans

Figure A-1 Location and extent of type 1 and type 2 habitat



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationary Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME: National Highways LICENCE NUMBER: 100030649 (2021)
 Contains public sector information licensed under the Open Government Licence v3.0. Contains OS data © Crown Copyright and database right 2020. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

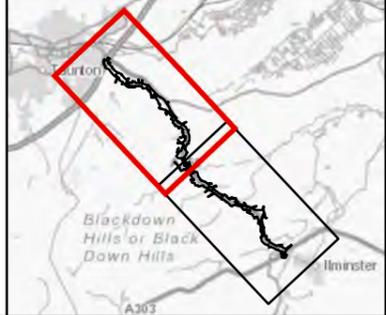
LEGEND

ECOLOGY SURVEY ZONE

ECOLOGY SURVEY ZONE BUFFER

FORAGING HABITAT

- TYPE 1 - PERMANENT, HIGH QUALITY TUSSOCKY GRASSLAND WITH THICK LITTER LAYER
- TYPE 2 - SUBOPTIMAL FORAGING HABITAT (TRANSIENT GRASSLAND, OPEN SCRUB)



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS (REFERENCE SHALL ALSO BE MADE IN THE DESIGN HAZARD LOG)

CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	06/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2 | Drawing Status: SUITABLE FOR INFORMATION

TAYLOR WOODROW together @ VINCI

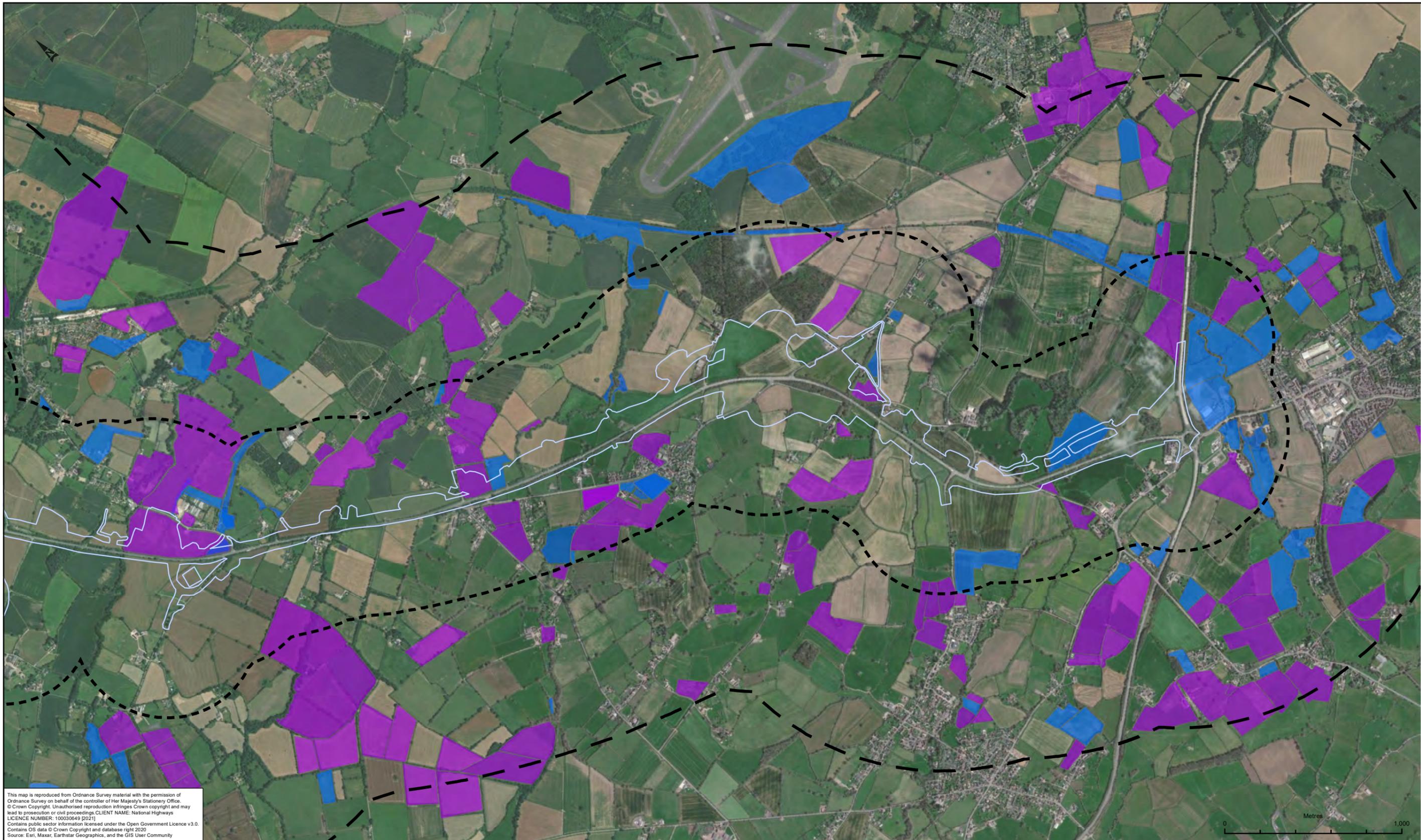
ARUP RAMBOLL

national highways

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: BARN OWL FORAGING PLAN SHEET 1 OF 2

Scale: 1:20,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 06/05/22	Date: 06/05/22	Date: 06/05/22	Date: 06/05/22
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02	
Location: ZZ	Type: -DR	Role: -LE	Number: -000156	



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationary Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME: National Highways LICENCE NUMBER: 100030649 (2021)
 Contains public sector information licensed under the Open Government Licence v3.0. Contains OS data © Crown Copyright and database right 2020. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

LEGEND

ECOLOGY SURVEY ZONE

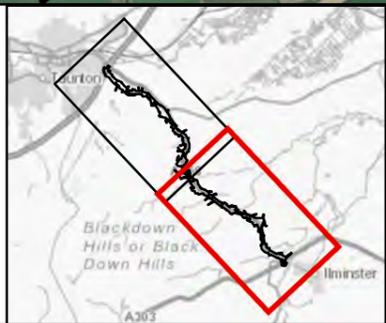
ECOLOGY SURVEY ZONE BUFFER

1.5KM

500M

FORAGING HABITAT

- TYPE 1 - PERMANENT, HIGH QUALITY TUSSOCKY GRASSLAND WITH THICK LITTER LAYER
- TYPE 2 - SUBOPTIMAL FORAGING HABITAT (TRANSIENT GRASSLAND, OPEN SCRUB)



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS (REFERENCE SHALL ALSO BE MADE IN THE DESIGN HAZARD LOG)

CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P01	06/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2
 Drawing Status: SUITABLE FOR INFORMATION

TAYLOR WOODROW together @ VINCI

ARUP RAMBOLL

national highways

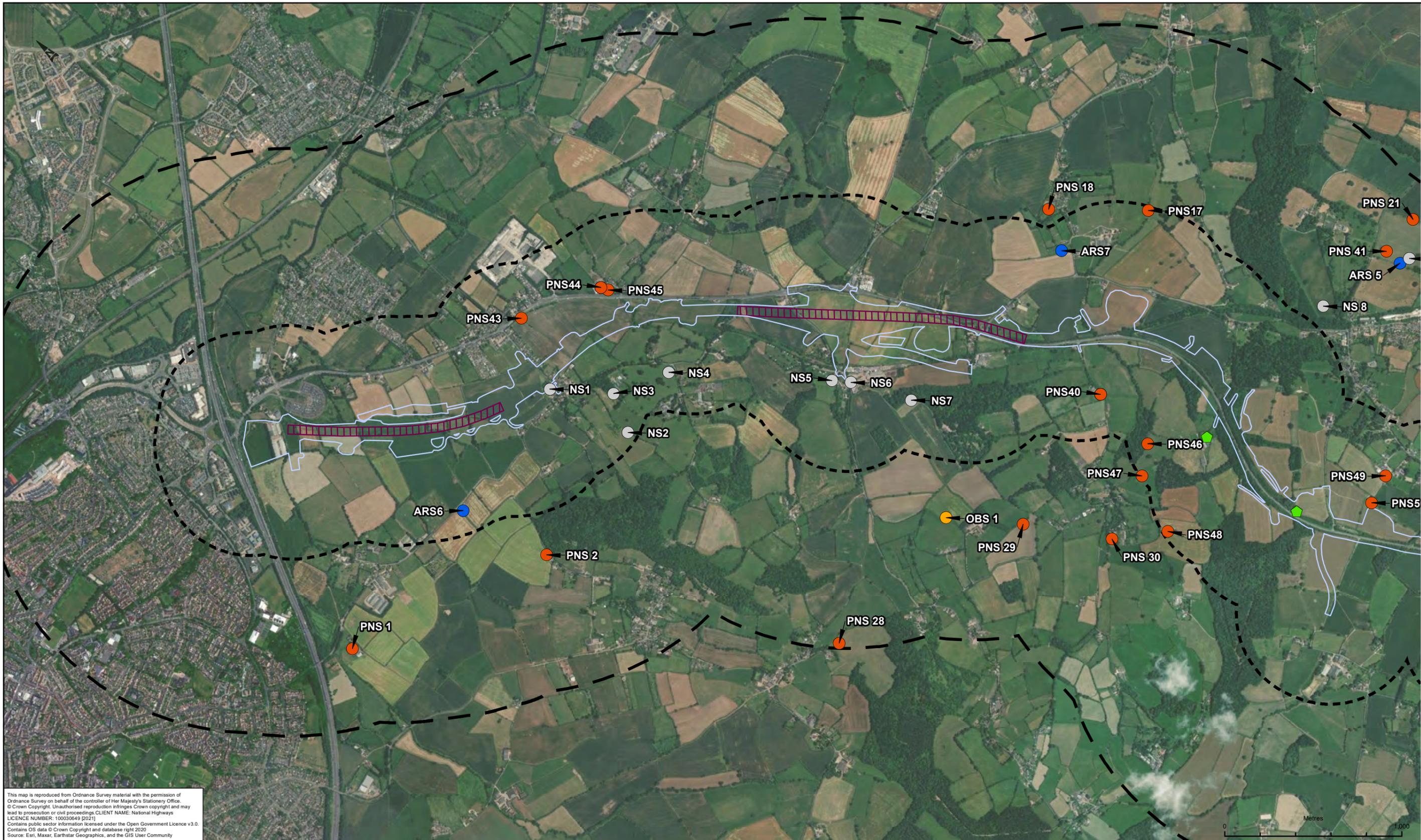
Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: BARN OWL FORAGING PLAN SHEET 2 OF 2

Scale	1:20,000	By	JE	Checked	MA	Approved	JS	Authorised	SV
Original Size	A3	Date	06/05/22	Date	06/05/22	Date	06/05/22	Date	06/05/22
Drawing Number	HE551508 - ZZ	Originator	ARP	Volume	VES	-DR - LE - 000157		Revision	P02
HE PIN	ZZ	Type	ARP	Role	VES	-DR - LE - 000157		Number	

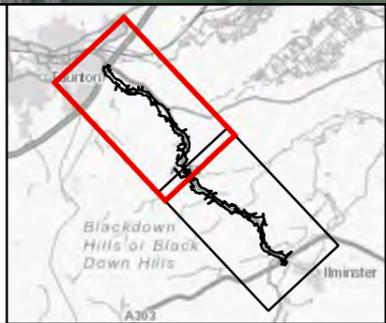
Appendix B Stage 2 and 3 field survey results

Figure B-1 Barn owl nesting plan (locations of PNS, ARS, TRS), potential TABs and incidental barn owl records



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationary Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME: National Highways LICENCE NUMBER: 100030649 [2021] Contains public sector information licensed under the Open Government Licence v3.0. Contains OS data © Crown Copyright and database right 2020. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

LEGEND	
	ECOLOGY SURVEY ZONE BUFFER
	BARN OWL TRAFFIC ACCIDENT BLACKSPOT
	FORAGING ACTIVITY
	CROSSING POINT
	CORPSE
PNS ASSESSMENT	
	OCCUPIED BREEDING SITES (OBS)
	ACTIVE ROOST SITE (ARS) - NO NESTING OPPORTUNITY
	TRANSIENT REST SITE (TRS) - NO NESTING OPPORTUNITY
	HISTORIC NEST SITE (HNS) - NO CURRENT NESTING ATTEMPT
	POTENTIAL NEST SITE (PNS) - NO CURRENT EVIDENCE
	NOT SUITABLE



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS (REFERENCE SHALL ALSO BE MADE IN THE DESIGN HAZARD LOG)	
CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	06/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

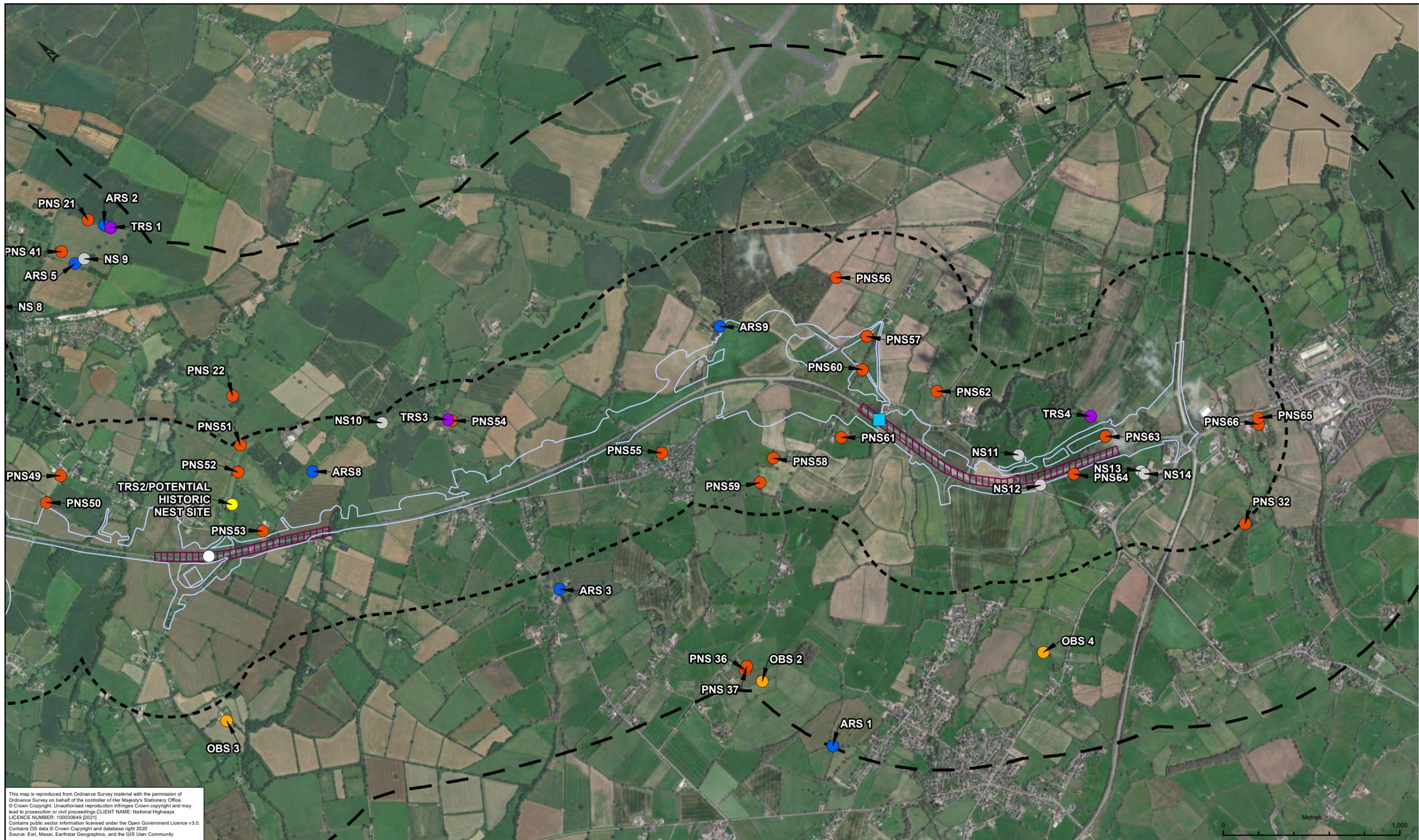
Suitability: S2 | Drawing Status: SUITABLE FOR INFORMATION

TAYLOR WOODROW
together @ VINCI

ARUP | **RAMBOLL**

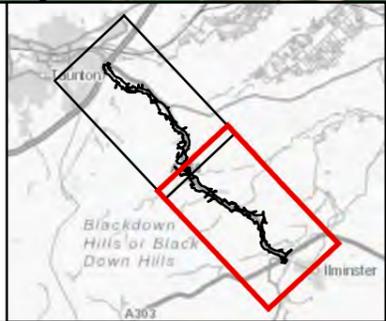
national highways

Project Title		A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME	
Drawing Title: BARN OWL NESTING PLAN AND INCIDENTAL RECORDS SHEET 1 OF 2			
Scale: 1:20,000	By: JE	Checked: MA	Approved: JS
Original Size: A3	Date: 06/05/22	Date: 06/05/22	Date: 06/05/22
Authorised: SV	Date: 06/05/22		
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02
Location: ZZ	Type: -DR	Role: LE	Number: 000158



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationary Office. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CLIENT NAME: National Highways LICENCE NUMBER: 100030649 (2021)
 Contains public sector information licensed under the Open Government Licence v3.0. Contains OS data © Crown Copyright and database right 2020. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

LEGEND	
ECOLOGY SURVEY ZONE BUFFER	PNS ASSESSMENT OCCUPIED BREEDING SITES (OBS)
1.5KM	ACTIVE ROOST SITE (ARS) - NO NESTING OPPORTUNITY
500M	TRANSIENT REST SITE (TRS) - NO NESTING OPPORTUNITY
BARN OWL TRAFFIC ACCIDENT BLACKSPOT	HISTORIC NEST SITE (HNS) - NO CURRENT NESTING ATTEMPT
FORAGING ACTIVITY	POTENTIAL NEST SITE (PNS) - NO CURRENT EVIDENCE
CROSSING POINT	NOT SUITABLE
CORPSE	



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS (REFERENCE SHALL ALSO BE MADE IN THE DESIGN HAZARD LOG)	
CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	06/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

S2 Drawing Status: SUITABLE FOR INFORMATION

Project Title		Scale		By	Checked	Approved	Authorised
A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME		1:20,000	JE	MA	JS	SV	
Drawing Title		Original Size	Date	Date	Date	Date	
BARN OWL NESTING PLAN AND INCIDENTAL RECORDS SHEET 2 OF 2		A3	06/05/22	06/05/22	06/05/22	06/05/22	
Drawing Number	HE PIN	Originator	Volume	Revision			
HE551508 - ZZ		ARP - DR - LE - 000200	VES	P02			

Table B-1 PNS features without barn owl evidence between 500 metres and 1.5 kilometres of the scheme – 2017 and 2018 field survey

Feature	Description		Stage 3 findings
PNS1	Derelict barn.	30/08/2017	None
PNS2	Open barn with hay rick	31/08/2017	None
PNS17	Cavities on north west side of ash	0/10/2017	See Table B-2
PNS18	Box in pear tree (<i>Pyrus communis</i>)	11/10/2017	None
PNS19	Cavity in oak limb at 10m on south side	12/10/2017	No barn owl evidence. Stock dove nest present
PNS20	Horse chestnut cavities on east and south sides	24/10/2017	Tree has been removed (see Table B-3)
PNS21	Cavity in broken branch on east side 8m height	24/10/2017	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, but little owl pellet on top of trunk.
PNS22	Cavity in limb on north east side at 3.5m	26/10/2017	None
PNS28	Cavity in dead oak trunk	09/11/2017	Little owl roost, no barn owl evidence
PNS29	Tree	N/A	No access for Stage 3
PNS30	Box in barn	10/11/2017	No barn owl evidence. Pigeon nest.
PNS32	Cavity in ash on south side at 7m	14/11/2017	None
PNS34	Barn with hay ricks	22/11/2017	Now ARS9, See Table 3-1
PNS35	Barn with nesting potential	22/11/2017	Now ARS9, See Table 3-1
PNS36	Box on oak	19/07/2018	No barn owl evidence. Little owl roost.
PNS37	Box on oak	19/07/2018	No barn owl evidence. Occupied by nesting stock dove.
PNS40	Purpose built entry to upper tier of barn	01/08/2018	See Table B-2
PNS41	Rot out on south side of turkey oak at 8m	30/08/2018	None

Table B-2 PNS features without barn owl evidence within 500 metres of the scheme – 2021 field survey

Feature	Type	Description	Date surveyed	Photos
PNS17	Mature ash trees with multiple cavities.	<p>Mature ash in riparian corridor with several cavities in largely hollow trunk.</p> <p>Lower cavity at 2.5m extends down to base of tree, no evidence identified. Trunk higher up appears to be hollow, visible through cracked bark on NW side. Unable to safely inspect cracks, but appear to be full of packed debris, indicating jackdaw nesting attempt. Precautionarily classified as PNS.</p> <p>Kestrel feathers and pellets also found at the base of tree.</p>	08/09/2021	

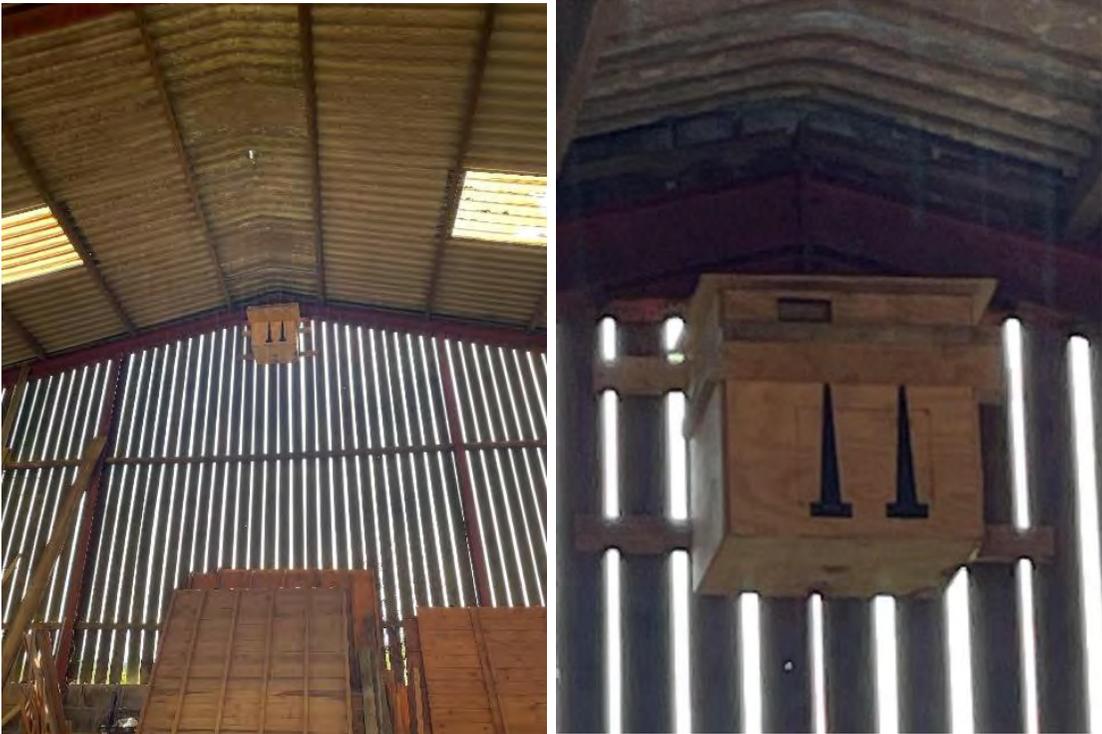
Feature	Type	Description	Date surveyed	Photos
PNS40	Purpose built cavity in barn	<p>Roof void of storage barn attached to main residential property. Void purpose built for barn owl, with entrance on the north facing gable. Has not been maintained and is somewhat dilapidated but still functioning.</p> <p>Piled nesting material indicates historic use by jackdaw.</p>	13/07/2021	

Feature	Type	Description	Date surveyed	Photos
PNS43	Small abandoned storage shed	<p>In field corner, now largely overgrown but still structurally sound.</p> <p>Roof void is suitable for nesting with entrance through large gaps in tiles at one end. Entrance partially obscured by vegetation at time of survey.</p> <p>No evidence of use by any species identified.</p>	13/07/2021	
PNS44	Gaps in stacked hay bales in Dutch barn	<p>Stacked hay bales in Dutch barn complex, with lots of cavities and depressions amongst bales offering suitable protection, all thoroughly checked.</p> <p>Landowner not present, so unable to determine the permanence of hay bales within the barn.</p>	13/07/2021	

Feature	Type	Description	Date surveyed	Photos
PNS45	Unused work shed	<p>Large open space in seemingly disused work shed in farmyard. Access through window panes with no glass.</p> <p>Wooden beams offer suitable perching points but nesting opportunities are limited to floor of the room, amongst old debris on the floor.</p>	13/07/2021	
PNS46	Purpose built nest box on oak tree	<p>Wooden nest box on oak on the edge of a woodland, facing open grazing land to the south. Looks to be in good condition and relatively newly installed.</p> <p>Stripped wood from inside box indicates use by grey squirrel.</p>	13/07/2021	

Feature	Type	Description	Date surveyed	Photos	
PNS47	Cracked limb on standard oak tree	<p>Large cracked-off limb within branch of a mature oak in cattle-grazed pasture.</p> <p>Feature too high to be safely checked, but appears to lead into a substantial cavity, possibly extending into the main trunk.</p> <p>Trampling by cattle around the base of the tree would obscure any evidence if present.</p>	13/07/2021		

Feature	Type	Description	Date surveyed	Photos
PNS48	Cavity in trunk of standard oak tree	<p>Mature hedgerow oak with cavity facing north. Entrance partially obscured by foliage and ivy, but large enough for access.</p> <p>Trampling by cattle around the base of the tree would obscure any evidence if present.</p>	13/07/2021	

Feature	Type	Description	Date surveyed	Photos
PNS49	Purpose built nest box in modern agricultural building	<p>Recently erected wooden nest box in good condition.</p> <p>Unable to undertake internal inspection as feature is at approximately 9m. Landowner reports box has not been used since erection.</p>	23/06/2021	

Feature	Type	Description	Date surveyed	Photos
PNS50	Cavity in trunk of an oak tree	<p>South facing cavity in forked trunk of mature hedgerow oak.</p> <p>Entrance hole and internal cavity of suitable dimensions for nesting, but highly obscured entrance reduces suitability for use by barn owl.</p>	23/06/2021	
PNS51	Cracked branch with scarring on pollarded oak tree	<p>Potential cavity behind cracked branch.</p> <p>Unable to safely inspect cavity with ladders due to ditch and barbed wire fence at base of tree. Precautionarily classified as PNS.</p>	22/06/2021	

Feature	Type	Description	Date surveyed	Photos
PNS52	Cavities within limbs of oak tree	<p>Two cavities within the bases of large limbs of largely hollow hedgerow oak.</p> <p>Both cavities of suitable dimensions for barn owl nesting and are dry inside.</p> <p>Little owl pellets and feather identified, indicating a roost.</p>	22/06/2021	
PNS53	Timber clad barn	<p>Broken timber cladding offering access to main barn. Ventilation hole offering access to roof void, which is sealed off.</p> <p>Building locked at time of survey, interior viewed through window. droppings visible.</p> <p>Bat dusk emergence survey in June did</p>	22/06/2021 (with dusk emergence survey using infrared cameras on 25/06/2021)	

Feature	Type	Description	Date surveyed	Photos
		not record barn owl activity.		
PNS54	Hay bales in Dutch barn	<p>Stacked hay bales in Dutch barn complex, with lots of cavities and depressions amongst bales offering suitable protection, all thoroughly checked. No other suitable roosting or nesting features present.</p> <p>Kestrel feathers identified atop bales indicating roosting by this species.</p>	29/06/2021	

Feature	Type	Description	Date surveyed	Photos
PNS55	Large unused barn	<p>Roof space of old stone barn, used for storage but seemingly not for a long time. Access is through window on northern aspect with missing glass. Potential to nest on floor amongst debris. Roosting opportunities on wooden beams.</p> <p>Old jackdaw nest including dead young identified in feature.</p>	15/07/2021	

Feature	Type	Description	Date surveyed	Photos
PNS56	Hollow oak on edge of woodland	<p>Huge cavity in oak caused by trunk fully rotting inside, down to ground level.</p> <p>Entrance hole from historic limb tear out at 3m height.</p> <p>Potentially too exposed to elements but precautionarily treated as PNS.</p>	29/06/2021	

Feature	Type	Description	Date surveyed	Photos
PNS57	Purpose built nest box in modern agricultural building	<p>Wooden nest box in good condition. Landowner report erecting several years before but has not seen barn owl utilise it.</p> <p>Occupied by nesting jackdaw at the time of survey.</p>	09/06/2021	

Feature	Type	Description	Date surveyed	Photos
PNS58	Cavity in ash tree	Apparent cavity high in trunk of mature ash. Cavity not reachable due to height and dense scrub surrounding base of the tree.	15/07/2021	

Feature	Type	Description	Date surveyed	Photos
PNS59	Cavities in mature willow tree	<p>Hollow trunk of a field boundary willow, with three potential entrances, though all low at 1.5m. Unable to inspect full extent of hollow trunk but appears to go down to ground level.</p> <p>Whitewash noted on adjoining vegetation and dead vole at the base of tree, possibly indicating dropped prey item.</p>	15/07/2021	
PNS60	Roof void in old barn	<p>Wooden storage barn adjoining farm property. Roof void has clear access where outer planks have fell.</p> <p>Appears that this barn is infrequently used and the roof void has clearly not been accessed for some time.</p>	08/06/2021	

Feature	Type	Description	Date surveyed	Photos	
PNS61	Cavity in standard oak tree	<p>Apparent cavity in trunk of oak, caused from limb tear out. Considerable heartwood visible in tear out but a small entrance into a potential cavity is visible.</p> <p>Feature not inspected internally as could not be safely reached with ladders.</p>	15/07/2021		
PNS62	Tray formed by stacked pallets	<p>Flat enclosed surface in modern barn created by stacked pallets with cupboard draws on top. 6m high.</p> <p>Feature is not permanent but landowner notes that they have been in this position for a number of years.</p>	08/06/2021		

Feature	Type	Description	Date surveyed	Photos
PNS63	Hollow oak tree	<p>Hollow trunk of squat veteran oak tree on field edge. Cavity formed by trunk rotting down to base, with entrance at 2.5m where the trunk branches. Somewhat obscured by the canopy.</p> <p>Cavity appears too exposed to the elements to be suitable for nesting barn owl but was dry at the time of survey. Precautionarily classified as PNS.</p>	09/08/2021	

Feature	Type	Description	Date surveyed	Photos
PNS64	Cavities in ash tree	<p>Two cavities in mature ash tree adjacent to river. Lower cavity caused by knothole is not suitable, with too small an entrance and insufficient cavity size behind.</p> <p>Not possible to check higher cavity at approximately 8m as unsafe to do so. Cavity appears to be larger but also more exposed to the elements. Precautionarily treated as PNS.</p>	08/06/2021	
PNS65	Derelict residential property	<p>Modern residential property but has clearly been abandoned for many years. Multiple access points through gaps in roof tiles. Assumed multiple suitable nesting surfaces inside.</p>	09/06/2021 (with subsequent dusk emergence on 02/08/2021)	

Feature	Type	Description	Date surveyed	Photos
PNS66	Derelict residential property	Modern residential property but has clearly been abandoned for many years. Multiple access points through gaps in roof tiles. Assumed multiple suitable nesting surfaces inside.	09/06/2021 (with subsequent dusk emergence on 02/08/2021)	

Table B-3 Features assessed as not suitable for nesting barn owl within 1.5 kilometres of the scheme (2017, 2018 and 2021 surveys)

Feature	Date of survey	Type	Description
NS1	01/07/2021	Dutch barn	Metal agricultural barn, no features other than stacked hay bales. Bales are low to the ground and clearly transient features.
NS2	30/07/2021	Mature ash tree	Cavity in hedgerow ash previously noted as a PNS. Stage 3 inspection showed cavity to be superficial and does not extend into trunk.
NS3	30/07/2021	Modern workshop	Low (under 3m high) breezeblock workshop. Internal inspection shows no suitable surfaces for nesting. Workshop is clearly also well maintained, regularly used and locked.
NS4	30/07/2021	Mature ash tree	Mature ash previously noted as PNS within area of wood pasture and parkland. Has been felled in the intervening years.
NS5	30/07/2021	Mature ash tree	Mature ash adjacent to farmland. Appeared to have cavity at 5m from ground level but was determined to be a wet depression on internal inspection.
NS6	30/07/2021	Stone farm outbuilding	Outbuilding amongst complex of modern barns. Wooden roof rafters offer suitable roosting station opportunity, but no evidence noted. Entrance is through open window in apex and building entrance. Four little owl pellets identified. Could easily be made suitable through provision of nest box, either integrated or sitting on rafters.

Feature	Date of survey	Type	Description
NS7	30/07/2021	Kestrel box	Old wooden nest box in Dutch barn on edge of Huish woods. Too small for barn owl and considered to be more suitable for kestrel or little owl. Numerous kestrel pellets on barn floor amongst farm machinery, which are clearly used as perches.
NS8	24/10/2017	Tree cavity	Tree has subsequently been removed
NS9	30/08/2018	Rot out cavity on south side at 3m	Stock dove nest. Too shallow for barn owl.
NS10	23/06/2021	Metal barn	Open fronted metal barn used for storage but looks highly disused with vegetation blocking some of the entrances. No suitable surfaces for nesting, with roosting opportunities only on gathered items stored in barn. Old buzzard (<i>Buteo buteo</i>) pellet identified.
NS11	09/06/2021	Mature oak tree	Highly mature oak in Jordan's Park. Several cavities, mostly too small for nesting barn owl and occupied by jackdaw. One larger cavity is of suitable dimensions but is permanently wet at the bottom.
NS12	08/06/2021	Mature small-leaved lime tree (<i>Tilia cordata</i>)	Mature lime tree in field with recent damage, possibly from lightning. Trunk has cracked and reveals trunk hollowed down to base from approximately 3.5m high. Feature is too exposed to precipitation to be suitable for nesting barn owl.
NS13	09/08/2021	Stone garage	Stone structure used as a garage. Open fronted acting as access point wooden rafters acting as potential perching points.
NS14	09/08/2021	Stone carport	Stone structure used as a car park. Open ended as access points with wooden rafters acting as potential perching points.

If you need help accessing this or any other National Highways information, please call **0300 123 5000** and we will help you.

© Crown copyright 2022.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit www.nationalarchives.gov.uk/doc/open-government-licence/

write to the **Information Policy Team, The National Archives, Kew, London TW9 4DU**, or email psi@nationalarchives.gsi.gov.uk.

Mapping (where present): © Crown copyright and database rights 2021 OS 100030649. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.

This document is also available on our website at www.nationalhighways.co.uk

For an accessible version of this publication please call **0300 123 5000** and we will help you.

If you have any enquiries about this publication email info@nationalhighways.co.uk or call **0300 123 5000***. Please quote the National Highways publications code **PR91/22**.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Printed on paper from well-managed forests and other controlled sources when issued directly by National Highways.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ

National Highways Company Limited registered in England and Wales number 09346363