

# A358 Taunton to Southfields Dualling Scheme

## Ecological Baseline Report - Amphibians

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## 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.

Amphibian 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 amphibian surveys undertaken throughout 2021, primarily to identify the presence of great crested newts, and aims to inform the ecology baseline for the scheme.

The objectives of this report are to present the methodologies used, identify survey limitations, and present the results of habitat suitability index assessment, presence/ likely absence and population assessment surveys; the results of which should be used to inform appropriate mitigation and enhancement.

Great crested newts are afforded full protection under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981. Great crested newts and common toad are listed as a species of principal importance in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Great crested newts are widely distributed throughout the lowland areas of Great Britain; however, their populations have declined over the past century, mainly because of habitat loss and deterioration. Their distribution in Somerset is localised and patchy, with notable absence from large areas of the county. Due to their notable absence throughout the west of Devon and Cornwall, it is likely that Somerset is towards the edge of the range for great crested newts. Other British amphibian species, including common toad, common frog, palmate newts and smooth newt are widespread across the south of England.

Two hundred and sixty-nine waterbodies located within the scheme study area were subject to ground truthing and great crested newt habitat suitability index assessments to confirm the presence and suitability of waterbodies identified during desk-based studies. Following this assessment, 87 waterbodies were identified as suitable for eDNA surveys, with 18 of these waterbodies subject to further population size class surveys using nationally accepted traditional survey methods as a result of either a positive or inconclusive eDNA survey result.

A series of limitations were encountered during the surveys, including unseasonably low overnight temperatures during April and May 2021, delayed land access permission to some waterbodies, physically inaccessible pond margins due to dense vegetation and restricted visibility into the water column due to the presence of macrophytes or high turbidity. Where limitations were encountered to specific survey techniques, alternative methods were used. Overall, the limitations are not considered significant, and the baseline detailed within this report is reliable for the purposes of the assessment of the impact of the scheme upon great crested newts.

Seven waterbodies have been recorded as supporting great crested newts, through either eDNA, population size class surveys or incidental observation; only one of these waterbodies, pond 54, is confirmed as a breeding pond. Ten waterbodies were recorded as supporting palmate newt, nine were recorded as supporting smooth newt, ten were recorded as supporting common frog and four found to support common toad. Four waterbodies were found to support at least four different amphibian species.

Further surveys will be undertaken on five waterbodies in 2022, where surveys were not able to be completed during 2021 due to land access restrictions. A precautionary approach will be taken to the impact assessment and design of any mitigation measures

associated with these five ponds until the surveys are completed. The impact assessment will be fully detailed within Chapter 8 of the Environmental Statement (ES), and the results of the 2022 surveys included in an updated version of this report to accompany the ES.

# 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. Great crested newt (GCN) 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 GCN surveys and aims to inform the ecology baseline for the scheme.
- 1.1.3 The objectives of this report are to:
- undertake a review of amphibian species records within 2 kilometres of the scheme
  - determine the presence or absence of any amphibian population in any waterbodies within the study area of the scheme
  - determine the population size class of any GCN populations found to be present within the study area of the scheme
  - provide sufficient information to inform an assessment of the potential impacts to amphibians as a result of the scheme and design appropriate mitigation measures (where required)

## 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.

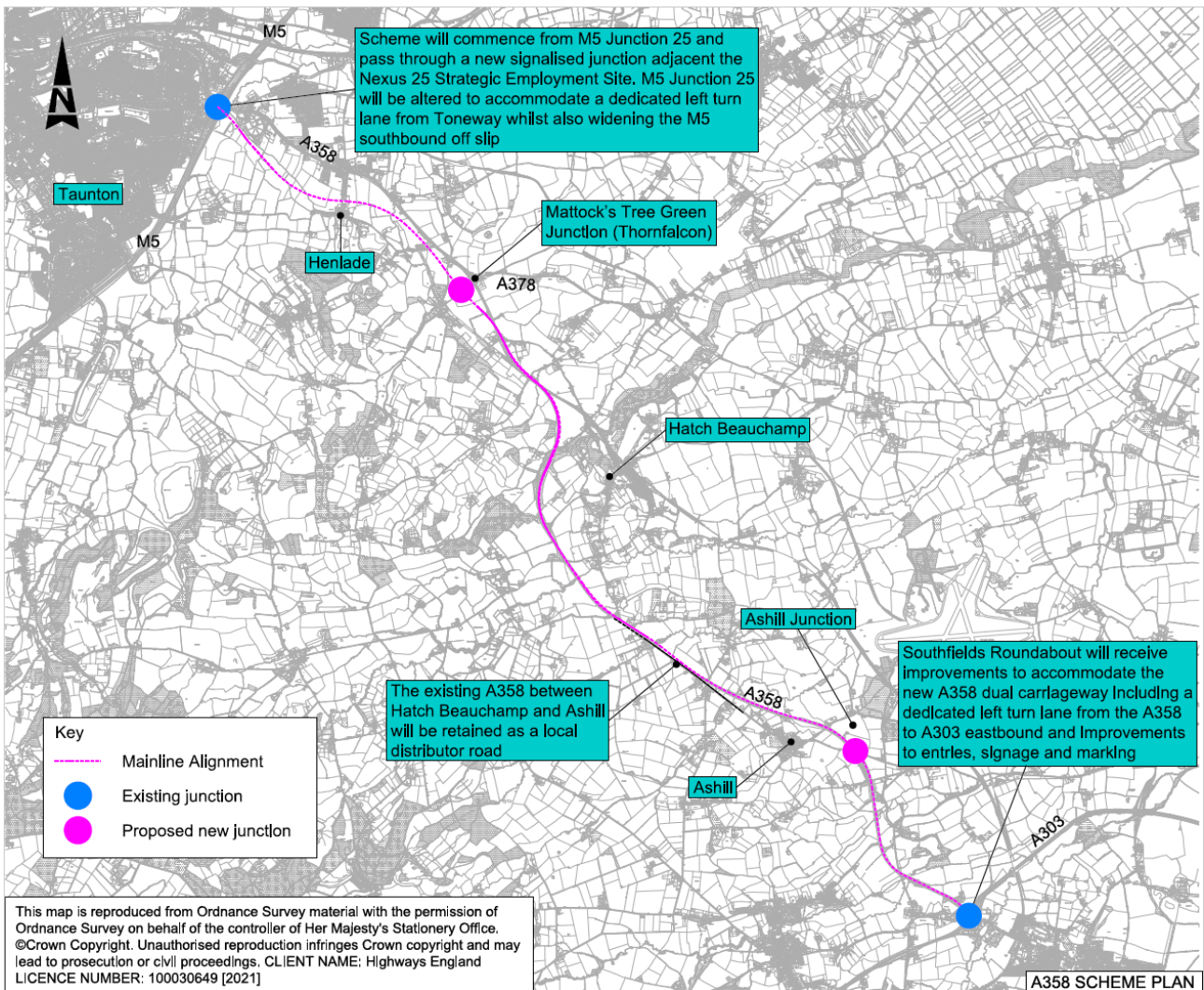


Figure 1-1 Scheme plan

### 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 Zone of Influence (Zoi) for a scheme are investigated. The Zoi 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 there is a risk of pollution and disturbance during construction and/or operation

1.3.2 The Zoi depends on the ecological features concerned. With regard to the GCN population likely to be affected by the scheme, the Zoi has been defined as land within 250 metres or 500 metres of the ecology survey zone, which comprises the footprint of the scheme and associated site clearance area. The scheme is divided into an online section which comprises dualling of the existing A358, and an offline section of new dual carriageway west of the proposed Mattock's Tree Green junction. The Zoi has been defined as land within 250 metres of the ecology survey zone of the online section and within 500 metres of the ecology

survey zone of the offline section. This Zol is hereafter referred to as the study area.

- 1.3.3 The study area is set within a largely agricultural landscape on either side of the existing A358. The dominant habitat type is arable and improved grassland pasture forming fields demarcated by species-rich hedgerows, improved grassland verges along the A358, and areas of semi-natural broadleaved woodland and mixed plantation woodland. Field edge and woodland ponds are scattered throughout the study area and many of the agricultural fields are demarcated by drainage ditches. The study area also includes small settlements and associated residential garden ponds.

## 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:
- The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations 2017')
  - Wildlife and Countryside Act 1981
  - Natural Environment and Rural Communities (NERC) Act 2006
- 1.4.2 GCN (*Triturus cristatus*) are afforded full protection under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981.
- 1.4.3 Under Regulation 43 of the Conservation of Habitats and Species Regulations it is illegal to:
- deliberately capture, injure or kill a GCN
  - deliberately disturb a GCN (in particular, disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, to hibernate or migrate or to affect significantly the local distribution or abundance of the species to which they belong)
  - deliberately take or destroy the eggs of GCN
  - damage or destroy a breeding site or resting place of GCN
- 1.4.4 Under Schedule 5 of the Wildlife and Countryside Act 1981 it is illegal to:
- intentionally or deliberately kill, injure or take any GCN
  - possess or control any live or dead specimen or anything derived from GCN
  - intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protected by GCN
  - intentionally or recklessly disturb GCN whilst they are occupying a structure or place used for that purpose
- 1.4.5 GCN are also listed as an Annex II species under the EU Habitats Directive, meaning they meet the criteria for site selection of Special Areas of Conservation to specifically conserve this species. Site selection is based on evidence of a large and robust population of GCN.



## 1.5 Status of amphibians at national level

- 1.5.1 GCN are widely distributed throughout the lowland areas of Great Britain but are absent from Ireland. Their populations have declined over the last century across Europe, including Britain, mainly because of habitat loss and deterioration. Other British amphibian species, including common toad, common frog, and smooth newt are widespread across England. Palmate newt are also widespread across England although have a preference for acid-rich soils, therefore are most commonly found on heathland in the south and west.
- 1.5.2 Historically, GCN were listed as a UK Biodiversity Action Plan (BAP) species and are now listed as a species of 'principal importance for the conservation of biodiversity in England' in accordance with Section 41 of the NERC Act 2006. Following the production of Biodiversity 2020, the national strategy for England, actions were identified by experts to help in the recovery of populations of the Section 41 listed species. Actions identified for the recovery of GCN include the following:
- Create, restore and manage ponds to provide breeding sites for GCN, and manage surrounding terrestrial habitats sympathetically.
  - Develop and implement methods and policies to remedy reversible adverse impacts at the population level, notably introduction of fish and invasive plants.
  - Develop and implement a surveillance plan to meet data needs at all spatial scales, for all appropriate stakeholders.
  - Review land use regulation and propose changes to improve outcomes for GCN.
- 1.5.3 In addition, there are four species of amphibian listed on Section 41 of the NERC Act 2006 [3]. The act places a duty on public organisations to 'have regard' toward the conservation status of those species. Of the species listed, only two could feasibly be present within the ZOI; great crested newt and common toad (*Bufo bufo*). These species were previously identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and continue to be regarded as conservation priorities.

## 1.6 Status of amphibians at county level

- 1.6.1 GCN are noted within the *Somerset Notable Species Dictionary* [4], which emphasises recording effort on species that are noted as uncommon, rare or of other ecological importance. Furthermore, both the smooth newt (*Lissotriton vulgaris*) and palmate newt (*Lissotriton helveticus*) are also listed as notable.
- 1.6.2 The population distribution for GCN throughout Somerset is described as localised and patchy, with notable absence from large areas of the county [5]. Populations of the species, where present, can occasionally be found in significant numbers, often with other native newt species. In parts of the Mendips, GCN have been found to be widely distributed, however fragmented into small, isolated pockets, with reliance on only one suitable breeding pond. Likewise, the species is frequently observed on the mid-Somerset hills and the Yeovil Scarplands, however, the species is notably absent from Exmoor and the far west of the county.

## 1.7 Great crested newt ecology

- 1.7.1 The GCN annual cycle commences on emergence from hibernation. They will move from their hibernation sites between February and April toward breeding ponds. GCN live and breed in a wide range of natural, semi-natural and man-made aquatic habitats including marshes, reed beds, wet ditches and ponds. Most adult newts move away from ponds and into terrestrial habitat between May and July. Suitable terrestrial habitat typically includes woodland, scrub, hedgerows and less intensively managed grassland. They seek out crevices and holes in the ground to spend the autumn, and regularly emerge to disperse and forage in warmer, wetter conditions. They will hibernate over winter once temperatures regularly fall below 5°C overnight.
- 1.7.2 GCN are known to range typically up to 500 metres from breeding ponds in search of feeding and hibernation sites [6]. Some GCN have been found to move over considerable distances (up to 1.3 kilometres from breeding sites) however the majority inhabit an area much closer to the pond. The quality of the terrestrial habitat near to breeding ponds is important, as are the lack of barriers to dispersal (such as watercourses or busy roads).
- 1.7.3 GCN often exist in metapopulations. A metapopulation is a group of associated populations. A metapopulation is made up from newts which breed in, and live around, a cluster of ponds. There will be some interchange of newts between ponds, although most adults consistently return to the same pond to breed. Metapopulations are much less vulnerable to habitat changes than populations based on single breeding ponds [6].

## 1.8 Other amphibian ecology

- 1.8.1 Similar to GCN, the annual cycle for other common British amphibian species also commences on emergence from hibernation. British amphibians are most active during the breeding season, which is typically between March and May, where they will be observed in or within close proximity to standing water, such as a pond or wet ditch. During the summer months and into early autumn, amphibians will seek refuge within suitable terrestrial habitat (including woodland, scrub, grassland, and hedgerows) during the day, and emerge to feed during the night. As temperatures begin to drop in the winter months, amphibians will find deep shelter beneath rocks, logs and within crevices to avoid frost and continue to hibernate until the following spring [7].

## 2 Methodology

### 2.1 Desk study

- 2.1.1 A detailed desk study was undertaken to identify all ponds and other potentially suitable waterbodies within 250 metres of the scheme's online section (i.e. the existing A358), and 500 metres of the offline section.
- 2.1.2 Ordnance survey maps, aerial photographs and *Multi-Agency Geographic Information for the Countryside (MAGIC)* [8] were reviewed to identify ponds and other relevant waterbodies within the study area and to review habitat connectivity between these and the scheme. This information was used to determine which waterbodies required field survey, on the basis that they could potentially support GCN populations and other amphibians that could be affected by the scheme.
- 2.1.3 A biological records search was conducted to obtain existing records of legally protected and notable species, including amphibians such as GCN. Species records within 2 kilometres of the scheme were requested from the Somerset Environmental Records Centre (SERC) in January 2021.
- 2.1.4 Records of over 10 years were omitted as they may not accurately represent the current status of any amphibian populations in the area.

### 2.2 Field study

- 2.2.1 All surveys were led by experienced ecologists: Alys Black, Amy Harris, Anna Burnham, Charlotte Phillips, Chloe Stephenson, Francesca Lemon, Jacob Haddon, John Daw, Mike Ashford, Nick Mason, Paul Parker, Steven Mills and William Feirn, with each survey lead holding a Natural England GCN Class Licence (Level 1 CL08).

#### **Habitat suitability index assessment**

- 2.2.2 A ground truthing and Habitat Suitability Index (HSI) assessment for GCN was completed on all accessible waterbodies within the study area using the standardised HSI methodology [9].
- 2.2.3 Habitats and features within the landscape that are known to benefit amphibian populations at different stages through the year for breeding, foraging, shelter and hibernation include [10]:
- a. Unshaded waterbodies with emergent and submerged vegetation, which rarely dry out.
  - b. Unimproved and semi-improved grassland, swamps, hedgerows and scrub
  - c. Connecting semi-natural habitat between ponds such as rough grassland, stone walls, hedgerows, scrub and trees.
  - d. Log piles and stone walls to provide refuge.
  - e. Absence of predators, such as fish or wildfowl.
- 2.2.4 The HSI is a measure of suitability and incorporates ten indices, as shown in Table 2-1 all of which are environmental factors based on the above habitat preferences for GCN at different stages during their lifecycle.

**Table 2-1 Habitat suitability index (HSI) criteria**

Suitability Indices	Factor
SI1	Geographic location
SI2	Pond area
SI3	Permanence
SI4	Water quality
SI5	Shade
SI6	Waterfowl
SI7	Fish
SI8	Additional ponds within 1 km
SI9	Terrestrial habitat
SI10	Macrophyte cover
HSI pond suitability summary scores: < 0.50 = poor; 0.50 – 0.59 = below average; 0.60 – 0.69 = average; 0.70– 0.79 = good; > 0.80 = excellent	

- 2.2.5 The results are expressed as an HSI score between 0 and 1, with 0 being unsuitable habitat and 1 representing optimal habitat, as summarised below. It is considered that ponds with a higher overall HSI score are more likely to support GCN than those with a lower score. The method is not sufficiently precise to conclude that ponds with a high score will support newts, or that any pond with a low score will not. It is therefore a tool to support, rather than a substitute for, GCN surveys.
- 0 to 0.5 = poor suitability for GCN
  - 0.51 to 0.59 = below average suitability for GCN
  - 0.6 to 0.69 = average suitability for GCN
  - 0.7 to 0.79 = good suitability for GCN
  - 0.8 to 1 = excellent suitability for GCN
- 2.2.6 The standard HSI assessment [11] above was developed for ponds and cannot be applied readily to a ditch system due to its linear and interconnected nature. A simplified suitability score for ditches was formulated by *The Environment Partnership* [12] to generate a suitability score based on key ditch characteristics (Table 2-2); this simplified HSI assessment for ditches has previously been accepted as an appropriate survey method by Natural England on the Hinckley Point C Connection Stage 4 project.
- 2.2.7 Ditches found to have an overall positive or neutral score using the five ditch characteristics would be subject to further survey (i.e., eDNA or traditional survey). A sixth characteristic, water flow, was also applied to the ditch HSI. Where water flow was assessed to be fast, the ditches were automatically scoped out as they would not provide suitable breeding habitat for GCN. Although this does not fully replicate the standard “pond-oriented” HSI, it does provide a consistent and efficient characterisation of the ditches in respect of amphibian breeding requirements. Positive measures were assumed when there was a level of uncertainty towards the criteria.

**Table 2-2 Ditch habitat suitability scoring system**

Ditch characteristic	Negative measure	Score	Positive measure	Score
Permanence	Dry or dries annually	-2	Wet (even water distribution, water level >5cm deep)	+1
Vegetation	No suitable egg laying plants present	-1	Suitable egg laying plant present	+1
Fish	Present	-1	Absent	+1
Shade	Shaded (>60% shaded, 1m from shore)	-1	Not shaded (>40% open 1m from shore)	+1
Water quality	Poor (e.g. evidence of pollution or enrichment)	-1	Moderate/Good (no evidence of pollution or enrichment)	+1

### eDNA survey

- 2.2.8 Environmental DNA analysis, known as eDNA, is a technique developed to detect the DNA of a target species, such as GCN, in the environment. When GCN inhabit a pond, cells containing their DNA are continually sloughed off into the water. The eDNA survey involved the collection of 20 water samples at regular points from around the perimeter of a waterbody, following the field protocol outlined within the *Defra Technical Advice Note* [13]. The samples are analysed in laboratories using DNA amplification techniques, to identify whether the target species is present.
- 2.2.9 All waterbodies that held sufficient levels of water to support GCN within the construction boundary and within 50 metres of the scheme were subject to eDNA survey for GCN. Additionally, all waterbodies returning a HSI score of 0.5 or above within the 250 metre buffer (for the online section) and 500 metre buffer (for the offline section) of the scheme were then subject to eDNA survey. Waterbodies that were not subject to eDNA included those that were either dry or otherwise unsuitable to support breeding GCN. Unsuitable waterbodies included ephemeral springs with little or no water, fast flowing water, wells with no surface water, swimming pools and waterbodies connected to inflows such as streams and ditches.
- 2.2.10 eDNA test kits were obtained from ADAS Ltd in order to collect water samples. These samples were then returned to ADAS Ltd who completed the laboratory analysis to determine the presence of GCN. The methods used for water sample collection and eDNA analysis were as described by *Biggs et. al.* [13] and were undertaken between 15 April and 30 June 2021, in line with guidance.

### Population size class surveys

- 2.2.11 Following a positive or inconclusive eDNA survey result in 2021, ponds were subject to population size class surveys using nationally accepted survey methods with at least three surveys completed during the core survey period between mid-April and mid-May. Alternatively, when eDNA surveys were not possible, population size class survey methods were undertaken as a means to determine presence/absence.
- 2.2.12 Four population size class surveys are required to confirm GCN presence or likely absence. Upon confirming the presence of GCN, the numbers of surveys were extended to six visits to allow an assessment of population size. The surveys

were undertaken in accordance with the guidelines outlined in the *Great Crested Newt Mitigation Guidelines* [14]. Each survey was undertaken by a Natural England GCN Class Licence holder and assistant. At least three survey methods were utilised for each visit. These included:

- I. **Bottle trapping:** Traps were set at approximately 2 metre intervals around the perimeter of the waterbodies. Ponds were visited in the evening to set up the traps, and an early morning visit to check and remove the traps. Animals observed were identified to species, sex and life stage where possible. This method should only be used when the night-time air temperature is greater than 5°C.
- II. **Torching:** The perimeter of the waterbodies was surveyed for GCN, and other amphibian species, after dark using a high-powered torch (1 million CP). Animals observed were identified to species, sex and life stage where possible. Torch survey results are dependent on weather conditions and should only be undertaken during night-time air temperatures of greater than 5°C, with no/little wind and no rain.
- III. **Egg searching:** The perimeter of the waterbodies was surveyed for GCN eggs by searching for folded leaves, and gently opening them to check for eggs. Only the minimum number of leaves were unwrapped to confirm the presence of a breeding pond, after which no more egg searching was undertaken. Whilst it is recognised this method is not suitable for estimating population size, it is valid for establishing presence/absence.
- IV. **Netting:** A dip net with a 2-4 millimetre mesh was used to sweep around the waterbody margins, particularly through vegetation. Catch was inspected then released. Animals observed were identified to species, sex and life stage where possible. Whilst it is recognised this method is not suitable for estimating population size, it is valid for establishing presence/absence.
- V. **Terrestrial refuge search:** suitable natural refuges within proximity to the waterbody such as logs, bark, moss, rocks and other debris that may retain moisture and create potential resting sites were searched by hand for the presence of GCN. Any amphibians found were identified to species and sex. Whilst it is recognised this method is not suitable for estimating population size, it is valid for establishing presence/absence.

### Estimating population size class

2.2.13 Population size class estimates were calculated according to the *Great Crested Newt Mitigation Guidelines* [14], utilising the peak adult count per survey visit, with juveniles not included for population estimates. Although these are very broad classifications, they can inform licensing and mitigation requirements. Table 2-3 summarises its application.

**Table 2-3 GCN population size classification**

Peak adult count in a single survey visit	Population size class
Maximum counts up to 10	Small
Maximum counts between 11 and 100	Medium
Maximum count >100	Large

## Weather conditions

- 2.2.14 As described above, GCN surveys are subject to high variation due to weather conditions. Periods of low temperature can reduce GCN activity and therefore make them less detectable; rain and wind can reduce visibility or risk damage to survey equipment and high temperatures can increase the likelihood of harm to newts caught in bottle traps. All surveys were undertaken strictly in accordance with animal welfare guidelines, and surveys postponed, or methods altered to account for weather conditions. All surveys were undertaken in line with the *Great Crested Newt Mitigation Guidelines* [14]. Weather conditions during the presence/absence surveys are summarised in Appendix H *GCN presence/absence survey results*.

## 2.3 Assumptions and limitations

### Ground truthing and HSI assessment

- 2.3.1 Of the 269 waterbodies identified, five were not accessible due to land access restrictions (60A, 60C, 61, D060 and D062). D060 is located 50 metres from the scheme, the remainder of the ponds are located greater than 150 metres from the scheme. Where access was not possible, professional judgement has been used and a reasonable precautionary approach taken to the impact assessment and mitigation design for the scheme in relation to GCN populations potentially present within these waterbodies.
- 2.3.2 During the HSI surveys, a number of waterbodies were reported as no longer present; ponds 112B and 112C had merged into the larger pond 112, and ponds 69E, 69F, 129, 133C, 135 were noted as no longer existing at the time of survey. Likewise, ditches D052 and D053 had been buried and replaced with hedgerows, and ditch D109 no longer exists as the land had recently been reclaimed into the agricultural field.
- 2.3.3 A number of waterbodies were not suitable for HSI assessment, or any additional surveys, due to a lack of standing water or the presence of fast flowing water. The lack of standing water during the spring/early summer significantly reduces the likelihood of the waterbody being used as a breeding resource by great crested newts or other common amphibian species who require standing water during this period to breed and for offspring to develop sufficiently to enter their respective terrestrial phase of their life cycle. It is recognised that the waterbodies could still offer a foraging and shelter resource for amphibians if holding standing or gently flowing water at other times of year, and if suitable breeding ponds are available in the local landscape. Waterbodies reported as being dry at the time of the survey included: 22, 32, 33, 35, 56A, 62, 69, 70, 80, 83, 84A, 92, 93, 94, 121, 140, 143, 147, 148, 149, 160, 165 and 171. Likewise, ditches D047, D049, D052, D054, D067, D068, D069, D075, D081, D084, D086, D087, D110, D112, D113 were also recorded as dry. Alternatively, ditches D001, D041, D042, D043, D044, D045, D046, D050, D051, D058, D065A, D071, D085, D085a, D089, D093, D099, D101, D102, D103, D108, D119, D121, D125 and D132 were all recorded as having strong to moderate flows, also making them unsuitable for HSI assessment.

### eDNA surveys

- 2.3.4 When undertaking eDNA surveys, 13 waterbodies had dried, or water levels had dropped significantly since the HSI assessment, making them unsuitable for

eDNA surveys. These waterbodies included 65, 90A, 126B, 129, 171, 173, 174, 175, 186, 189, D004, D082 and D130.

- 2.3.5 In some instances, physical access to the waterbodies became a constraint, as banks became overgrown with dense vegetation and/or unstable due to weather conditions. This limited access and restricted the perimeter of the waterbodies at which water samples could be collected. Waterbodies with areas of inaccessible bank included 27, 36B, 37, 47, 55A, 68, 69C, 84C, 104, 120, 127, 131, 142, D058, D072 and D128. However, samples were successfully collected from these waterbodies despite access limitations. The waterbodies subject to eDNA survey limitations are summarised in Table 2-4.

### **Population size class surveys**

- 2.3.6 Four ponds; 36A, 36B, 59A and 59 were not accessed until later in May and early June, therefore while eDNA surveys were able to be completed, population size class surveys were not able to subsequently be undertaken within the core survey period in line with guidance. These ponds returned positive or inconclusive eDNA results and will therefore be subject to population size class surveys in spring 2022.
- 2.3.7 The completion of population size class surveys was typically dependant on environmental constraints: such as temperature, presence of vegetation and water condition. Where possible, when preferred survey methods could not be used, alternative methods were implemented. Details of these survey limitations are provided below and summarised in Table 2-4.

### Egg searches

- 2.3.8 A lack of suitable vegetation was observed at waterbodies 67, 127B, 145, 145B and 187. This meant that egg searches at these locations were not able to be completed.

### Bottle trapping

- 2.3.9 Overnight temperatures influence the suitability of undertaking bottle trapping surveys. When temperatures dropped below the 5°C threshold, these surveys were unable to be completed. In such instances, an alternative method such as sweep netting or refuge searching was deployed; however, these methods cannot be used for population size assessments. The spring of 2021 was notable for its very low overnight temperatures; there were three evenings in particular that recorded temperatures lower than the 5°C threshold: 29 April, 05 May and 06 May 2021. As a result, bottle trapping surveys were unable to be completed at the following waterbodies on these dates: 30B, 54, 55A, 67, 100, 104, 110, 111, 180, 187 and 190.
- 2.3.10 On occasion, water shrews (*Neomys fodiens*) were captured in the bottle traps. When this occurred, the water shrews were removed from the trap, and all traps were removed from the waterbody. For this reason, trapping was abandoned at waterbodies 40 and 40A after the 1<sup>st</sup> and 2<sup>nd</sup> visit respectively. Consequently, sweep netting was deployed as an alternative survey technique at both locations. A water shrew was also captured during bottle trapping at pond 187, however this did not impact the survey as this occurred on the final visit.



2.3.11 Bottle trapping was not suitable at pond 84C as the pond was lined and stocked with fish. Therefore, torch surveys, egg searches and sweep netting were used as alternative survey methods.

#### Torch surveys

2.3.12 When undertaking torch surveys dense vegetation, such as duckweed, posed challenges with visibility, and whilst it was sometimes possible to move the vegetation, visibility was notably restricted. This impacted the survey of waterbodies 67, 180 and 190. In such instances refuge searches and sweep netting were deployed as alternative techniques.

2.3.13 High turbidity also was a constraint for torch surveys, as visibility became restricted. Torch surveys were therefore limited at waterbody 55A, 100 and 145B; however, the surveys were still able to be completed using this technique.

**Table 2-4 Survey limitations summary table**

Waterbody ID	eDNA survey limitation	Population size class survey limitation
27	Restricted access due to vegetation.	N/A
30B	N/A	Access to pond was restricted and the pond had dried up considerably prior to survey.
34	High levels of precipitation prior to survey. Restricted access due to vegetation.	N/A
36A	High levels of precipitation prior to survey.	N/A
37	Restricted access due to vegetation.	N/A
40	N/A	Pond has been lined making bottle trapping challenging. Dead water shrew found within bottle traps during survey, making the pond unsuitable for further bottle trap surveys.
40A	N/A	Pond has been lined making positioning bottle traps challenging.
47	Restricted access due to vegetation.	N/A
54	N/A	Overnight temperatures dropped below 5°C on 05/05/2021 therefore unsuitable for bottle trapping.
55	Pond dried out considerably prior to survey.	N/A
55A	Restricted access due to vegetation.	Pond dried out considerably prior to survey.
64B	Poor water quality observed.	N/A
65	Pond dried out considerably prior to survey.	N/A
67	N/A	Restricted access due to vegetation.
68	Restricted access due to vegetation.	N/A
69A	Restricted access due to vegetation.	N/A
69C	Access to pond restricted by netting positioned over the water.	N/A
84C	Access to pond was restricted by surrounding flowerbed.	Pond has been lined and stocked with fish making it unsuitable for bottle trapping.
90A	Pond dried out considerably prior to survey.	N/A
91	Pond dried out considerably prior to survey.	N/A

Waterbody ID	eDNA survey limitation	Population size class survey limitation
100	N/A	Access to pond was limited, and turbidity restricted visibility for torching.
102	Pond dried out considerably prior to survey.	N/A
104	Restricted access due to vegetation.	Visibility of water restricted by duckweed.
105	Restricted access due to vegetation.	N/A
107	Restricted access due to vegetation.	N/A
110	N/A	Pond dried out considerably prior to survey. Egg searches limited to leaf litter only.
111	N/A	Pond dried out considerably prior to survey. Egg searches limited to leaf litter only. Restricted access due to vegetation.
120	Restricted access due to vegetation.	N/A
126	N/A	Access to pond was restricted due to duck nest. Egg searches limited to leaf litter only.
126A	Pond dried out considerably prior to survey.	N/A
126B	Pond dried out considerably prior to survey.	N/A
127	Restricted access due to vegetation.	N/A
127A	Restricted access due to vegetation.	N/A
127B	N/A	Visibility of water restricted by duckweed. No suitable vegetation for egg searches.
128	Pond dried out considerably prior to survey.	N/A
131	Restricted access due to vegetation.	N/A
131A	Pond dried out considerably prior to survey.	N/A
142	Restricted access due to vegetation.	N/A
145	N/A	High turbidity restricting visibility for torching.
145B	Water contaminated by slurry run-off.	Water contaminated by slurry run-off. High turbidity restricting visibility for torching. No suitable vegetation for egg searches
167	Restricted access due to vegetation.	N/A
168	Restricted access due to vegetation.	N/A
170	Restricted access due to vegetation.	N/A
171	Pond dried out considerably prior to survey.	N/A
173	Pond dried out considerably prior to survey.	N/A
174	Pond dried out considerably prior to survey.	N/A
175	Pond dried out considerably prior to survey.	N/A
180	N/A	Visibility of water restricted by duckweed.
186	Pond dried out considerably prior to survey.	N/A
189	Pond dried out considerably prior to survey.	Overnight temperatures dropped below 5°C on 05/05/2021, therefore unsuitable for bottle trapping. No suitable vegetation for egg searches. High rainfall on 19/05/2021 causing increased turbidity and restricted visibility for torching surveys.
190	Restricted access due to vegetation.	Late return of eDNA results meaning multiple surveys had to be completed within one week. Overnight temperatures dropped

Waterbody ID	eDNA survey limitation	Population size class survey limitation
		below 5°C on 06/05/2021, making it unsuitable for bottle trap surveys. Visibility of water was restricted by duckweed.
D004	Ditch dried out considerably prior to survey.	N/A
D058	Ditch dried out considerably prior to survey.	N/A
D065	Ditch dried out considerably prior to survey.	N/A
D072	Restricted access due to vegetation.	N/A
D082	Ditch dried out considerably prior to survey.	N/A
D120	Ditch dried out considerably prior to survey.	N/A
D128	Restricted access due to vegetation and dried out considerably prior to survey.	N/A
D130	No land access permission and dried out considerably prior to survey.	N/A
D134	Restricted access due to vegetation.	N/A

## 3 Results

### 3.1 Desk study

- 3.1.1 The data search results from SERC returned 19 records of GCN within 2 kilometres of the scheme; two records at a location near Ash, Thornfalcon within the scheme boundary and 17 records across four locations to the west of Ilminster, the closest of which is 750 metres south of the scheme boundary.
- 3.1.2 Nine records of common toad (*Bufo bufo*) were returned within 2 kilometres of the scheme; three records across two locations west of Ilminster 750 metres south of the scheme boundary, a record from a location on the northern edge of Ilminster 750 metres east of the scheme boundary, one record at a location in Wrantage 1.2 kilometres east of the proposed scheme boundary and four records across two locations north-east of Slough Green 1.8 kilometres west of the scheme boundary.
- 3.1.3 Six records of palmate newt were returned within 2 kilometres of the scheme; one record at a location near Ash, Thornfalcon within the scheme boundary, one record at a location to the west of Ilminster 750 metres to the south of the scheme boundary, three records at a location at the western edge of Ilminster 970 metres south of the scheme boundary and one record in Ilminster 1.6 kilometres south of the scheme boundary. A map of all of the amphibian records is provided in Appendix A *Biological records plan*.
- 3.1.4 The initial desk-based pond scoping exercise identified 188 potentially suitable waterbodies within the study area, consisting of 126 ponds and 62 ditches.

### 3.2 Field study

- 3.2.1 The surveyed waterbodies were mainly located within woodland habitats, typically adjacent to arable and grazed farmland. Occasionally, ponds were located within residential areas, often surrounded by amenity ornamental gardens. In addition, a number of waterbodies identified during the desk study were ephemeral springs or depressions which held little or no standing water at the time of the surveys
- 3.2.2 All waterbodies subject to field survey are shown on Appendix B *Waterbody location plan* and are described in Appendix C *Waterbody descriptions summary*.

#### Habitat suitability index

- 3.2.3 Following site visits, additional waterbodies were found that had not been located during the initial desk-based scoping exercise. In total, 263 waterbodies were deemed suitable for subsequent HSI assessments; including 150 ponds and 113 ditches.
- 3.2.4 The detailed results of the HSI surveys can be found within Appendix D *Habitats suitability index assessment summary table* and the results summarised on the plans included in Appendix E *Great crested newt HSI assessment score*.

#### eDNA survey

- 3.2.5 Following a complete HSI assessment, resulting in a score of 0.5 or above, or score an overall positive or neutral score using the five ditch characteristics, 87 waterbodies were deemed as suitable for eDNA surveys. From this, samples were successfully collected from 73 waterbodies, as 14 waterbodies were

deemed unsuitable for sampling during the eDNA survey due to lack of standing water.

- 3.2.6 Five waterbodies returned positive eDNA results and an additional eight returned inconclusive results as summarised in Table 3-1 below, all remaining waterbodies were negative for GCN eDNA. A summary of all eDNA results from surveys undertaken in 2021 is presented in Appendix F *eDNA Survey results plan*.

**Table 3-1 eDNA positive and inconclusive results**

Waterbody ID	Survey date	eDNA survey result	Proximity to the scheme
36A	13/05/2021	Positive	60m
36B	13/05/2021	Positive	80m
59	24/06/2021	Inconclusive	Within the scheme boundary
59A	24/06/2021	Positive	Within the scheme
84C	16/04/2021	Inconclusive	50m
104	15/04/2021	Inconclusive	70m
145	15/04/2021	Inconclusive	90m
145B	15/04/2021	Inconclusive	90m
153	15/04/2021	Inconclusive	Within the scheme boundary
180	19/04/2021	Positive	110m
187	16/04/2021	Inconclusive	Within the scheme boundary
190	23/04/2021	Positive	20m
D120	30/04/2021	Inconclusive	Partially within the scheme boundary

### Populations size class surveys

- 3.2.7 Following the eDNA surveys, 10 ponds were subject to additional population size class surveys using three survey methods to confirm presence/absence and/or provide an estimate of population size. In addition, eight waterbodies were immediately taken forward for presence/absence surveys using traditional methods because the water body was not suitable for eDNA.
- 3.2.8 A plan showing the results of these surveys is provided in Appendix G *GCN population size class survey plan* and detailed survey results are provided in Appendix H *GCN population size class survey results*. A summary of survey results by waterbody is also provided in Appendix I *Waterbody GCN results summary table* and illustrated in Appendix J *Great Crested Newts Survey Results Plan*. In total, only one pond returned at least one positive encounter with a GCN; pond 54, which is located within the scheme boundary. Pond 54 was also the only pond where GCN eggs were encountered.
- 3.2.9 Pond 54 was subjected to six GCN surveys; detailed survey results are provided in Table 3-2 below. The maximum numbers of GCN found during any one survey were 23 individuals during a torching survey on visit 2, which comprised 21 adult males, one adult female and one indeterminate adult. The lowest maximum count for any one survey was eight individuals during a torching survey on visit 3, which comprised three adult males, one adult female and four indeterminate adults. GCN eggs were also recorded during visit 3 confirming the ponds status as a breeding pond. The population size class is therefore assessed as medium in accordance with the *Great Crested Newt Mitigation Guidelines* [14].

3.2.10 In addition to GCN, the surveys found populations of palmate newt and smooth newt, as well as populations of both common frog (*Rana temporaria*) and common toad. Table 3-3 summarises the peak count of other amphibians encountered.

**Table 3-2 Pond 54 population size class survey results**

Pond 54: Date of survey	Bottle trapping					Egg search					Sweep netting					Torching				
	GCN	SN	PN	CF	CT	GCN	SN	PN	CF	CT	GCN	SN	PN	CF	CT	GCN	SN	PN	CF	CT
27/04/21	0	2	0	0	0	N	N	N	N	N	0	0	0	0	0	15	27	6	0	0
05/05/21	0	0	0	0	0	N	N	N	N	N	0	1	1	0	0	23	18	2	0	0
11/05/21	7	4	0	0	0	Y	N	N	N	N	0	0	0	0	0	15	18	1	0	0
18/05/21	4	0	0	0	0	N	N	N	N	N	0	0	0	0	0	8	15	3	0	0
24/05/21	1	1	0	0	0	N	N	N	N	N	0	0	0	0	0	11	14	6	0	0
01/06/21	3	0	0	0	0	N	N	N	N	N	0	1	0	0	0	12	21	3	0	0

Note: GCN = great crested newt, SN = smooth newt, PN = palmate newt, CF = common frog, CT = common toad

**Table 3-3 Amphibian peak counts recorded during population size class surveys**

Waterbody ID	GCN	Smooth newt	Palmate newt	Common toad	Common frog
30B	0	1	3	0	3
40	0	5	3	9	100
40A	0	10	10	2	1
54	24	21	6	0	0
67	0	0	2	0	0
84C	0	20	12	1	9
100	0	2	2	1	0
104	0	9	21	0	1
111	0	0	0	0	5
145	0	0	0	0	1
180	0	0	0	0	1
187	0	5	7	0	1
190	0	6	10	0	2

### Incidental records

3.2.11 During an inspection by engineers of a drainage structure associated with a highways flood attenuation basin, waterbody 55A, a newt was observed and photographed and confirmed by an ecologist to be a GCN. This pond was subject to four presence absence surveys as well as an eDNA survey and no GCN were detected. Due to the lack of suitable egg laying material, it is considered unlikely that this is a breeding pond. Given the survey results, it may be that the individual GCN encountered was dispersing from the confirmed medium sized GCN population within pond 54, which is located approximately 220m to the north-west of 55A.

## Metapopulations

- 3.2.12 Only pond 54 was confirmed as supporting a breeding population of GCN despite GCN presence being confirmed in an additional six waterbodies, it is recognised that these ponds may be used for breeding in other years or more likely that breeding ponds are present within the wider landscape beyond the survey area and form part of an interconnected cluster of ponds and associated terrestrial habitats utilised by a metapopulation of GCN.
- 3.2.13 The seven ponds confirmed as supporting GCN are assumed to fall within four distinct metapopulations on the basis of the distance between confirmed great crested newt ponds, with movement of GCN up to 1 kilometre between waterbodies, where there is not a significant barrier to dispersal such as a fast-flowing watercourse or major road. The four assumed metapopulations are:
- To the south of the A358 at Henlade, with GCN presence confirmed at ponds 36A, 36B and 190.
  - South of Mattocks Tree Green and north-east of the A358, with GCN presence confirmed at ponds 54 and 55A.
  - Within the Hatch Park Estate including pond 59A, while only 1.5 kilometres from the confirmed population at pond 54 it is located on the far side of the A358 and few waterbodies identified between these two area.
  - Around the village of Rapps including pond 180 and greater than 5.5 kilometres from the nearest confirmed GCN population along the scheme.

## 4 Conclusions

- 4.1.1 Surveys have been undertaken on waterbodies within the study area of the scheme over multiple years since 2016. Update surveys have been undertaken across all ponds within the study area during 2021. In total, 263 waterbodies were subject to surveys for GCN. As described in Section 2.5 a series of limitations were encountered during the surveys, most notably land access, unseasonably cold overnight temperatures in April and May 2021 which meant bottle trapping surveys were not able to be undertaken across multiple waterbodies, and high turbidity or vegetation cover which restricted the use of torch surveys. Where such survey methods could not be deployed, they were replaced with alternative methods such as sweep netting and/or terrestrial refuge searches. While it is recognised these methods are not suitable for estimating population size, they are valid for establishing presence/absence. In combination with the previous years of surveys, the survey results presented in this report are considered to form a reliable baseline and the limitations described are not considered to be significant for the purposes of the assessment of the impact of the scheme upon GCN.
- 4.1.2 Following HSI and eDNA surveys, five waterbodies, 36A, 36B, 59A, 180 and 190, returned a positive result for the presence of GCN. Due to land access constraints three of these ponds, 36A, 36B within 100 metres of the scheme boundary and 59A which falls within the scheme boundary, were subject to eDNA surveys too late in the season to allow subsequent population size class surveys. These surveys will be undertaken in 2022 and reported alongside the ES.
- 4.1.3 Ponds 180 located 110 metres from the scheme boundary, and 190 located within the scheme boundary, were eDNA positive and therefore subject to population size class surveys however no GCN were encountered, and no GCN eggs observed. This would suggest that low numbers of GCN use or pass through the ponds but that they are not breeding within them. The ponds may still represent an important resource for the GCN population and any impacts upon these will be assessed accordingly within the ES.
- 4.1.4 An additional eight waterbodies returned an inconclusive eDNA result, of these six, 84C, 104, 145, 145B, 153 and 187, were subject to presence/absence surveys using traditional methods and GCN found to be absent. One of the waterbodies, D120, was found to be dry following the eDNA survey. The remaining waterbody, 59, falls within the scheme boundary; however, as this was not able to be accessed until later in the survey season it will be subject to presence/absence survey in 2022.
- 4.1.5 Upon completion of populations size class surveys, only pond 54 recorded GCN. A peak count of 24 individual adults were recorded, which equates to a medium-sized population. Pond 54 falls within the footprint of the scheme.
- 4.1.6 A single adult GCN was incidentally recorded within pond 55a within the scheme boundary. This pond was however subject to four presence/absence surveys using traditional methods as well as an eDNA survey, all of which did not record the presence of GCN. This waterbody is a flood attenuation basin associated with the existing A358 with limited suitable aquatic vegetation for egg laying, likely as a result of the fluctuations in water levels it is subject to with periods where the basin is dry. In combination with the survey results it would suggest that this pond is not a breeding pond and is occasionally used by low numbers of GCN



associated with the medium-sized population, within pond 54, which is located 220 metres to the south-west and connected by suitable terrestrial habitats. Given that the pond is located within the scheme boundary, and subject to large fluctuations in suitability for GCN, an update habitat suitability assessment will be undertaken in 2022, and further presence/absence surveys as appropriate.

- 4.1.7 In summary, seven waterbodies have been recorded as supporting GCN, through either eDNA, population size class surveys or incidental observation. Waterbodies recorded as supporting GCN include 36A, 36B, 54, 55A, 59A, 180 and 190. However, only one of these waterbodies, pond 54, is confirmed as a breeding pond.
- 4.1.8 Due to the confirmed presence of at least one GCN breeding pond, the presence of GCN within non-breeding ponds throughout the scheme and the large areas of suitable terrestrial habitats within the land required for the scheme, the GCN metapopulations within the study area is considered to be of county importance.
- 4.1.9 It is recognised that the survey results for the waterbodies only provide a snapshot of the GCN presence within the survey area. Breeding ponds will be present in the locality beyond the survey area and the waterbodies within the survey confirmed as supporting GCN, but not confirmed as breeding ponds, may be used for breeding in other years. For the purposes of the impact assessment and mitigation design all ponds confirmed as supporting GCN will be valued equally.
- 4.1.10 Other amphibian species were encountered on multiple occasions during the pond surveys. Ten waterbodies were recorded as supporting palmate newt, nine were recorded as supporting smooth newt, ten were recorded as supporting common frog and four found to support common toad. Four waterbodies, ponds 40, 40A, 84C and 190, were found to support at least four different amphibian species. The study area includes a large number of ponds and associated suitable terrestrial habitats for amphibian populations, and amphibians are likely to be present within additional ponds to those recorded alongside the great crested newt surveys. Given the number of amphibians recorded across the scheme, the amphibian populations present within the study area are considered to be of local importance.
- 4.1.11 The impact assessment upon the amphibian populations within these waterbodies and any mitigation measures required will be fully detailed within the scheme Environmental Statement.

## Abbreviations List

Please refer to ES Report Chapter 17 Abbreviations

## Glossary

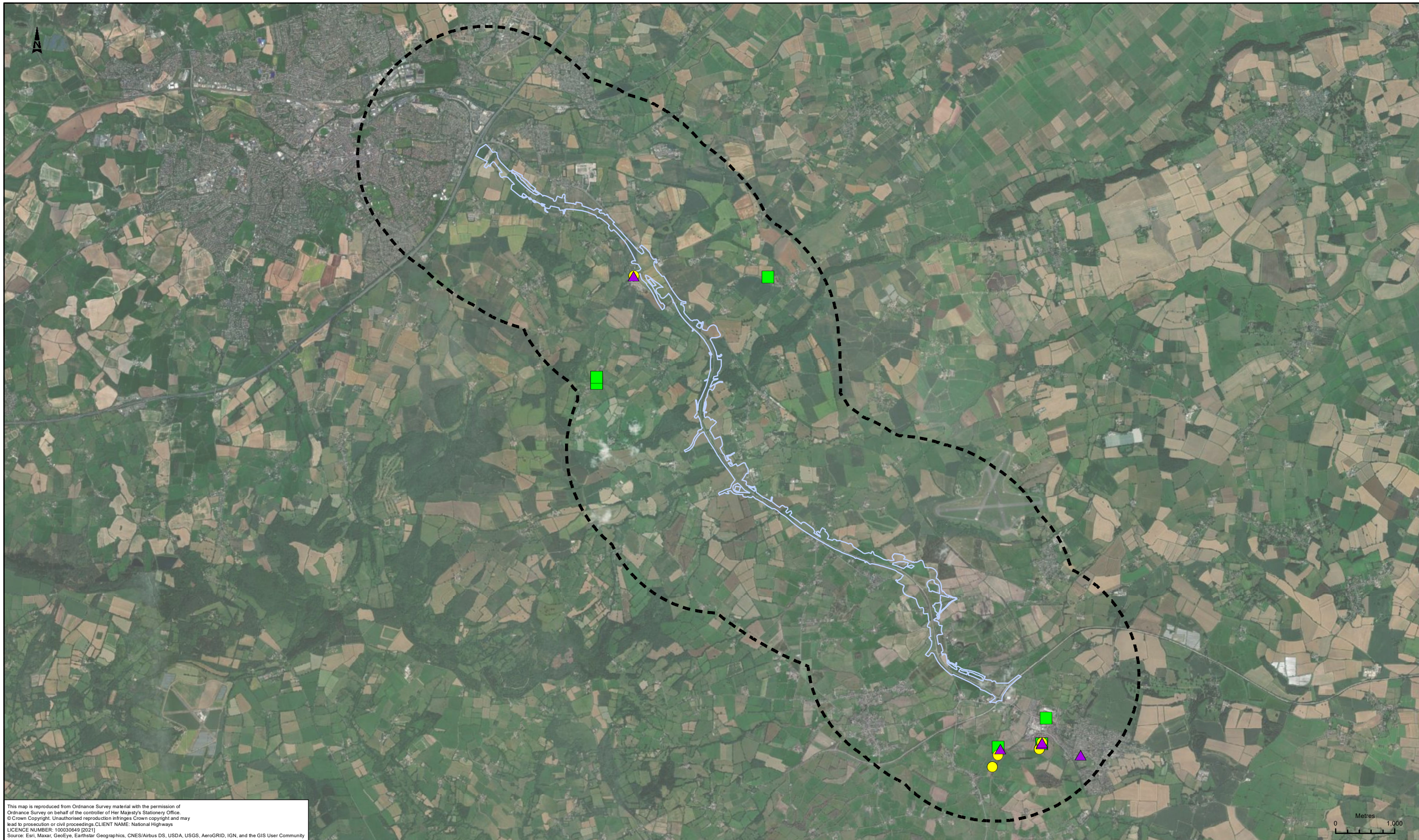
Please refer to 18 Report Chapter 18 Glossary

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# Appendices

# Appendix A Amphibians biological records plan



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- LEGEND**
- ECOLOGY SURVEY ZONE
  - 2KM DATA SEARCH AREA
  - SERC AMPHIBIAN RECORD**
  - COMMON TOAD
  - GREAT CRESTED NEWT
  - PALMATE NEWT

**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	13/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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**ARUP** **RAMBOLL**

Client: **national highways**

Project Title: **A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME**

Drawing Title: **AMPHIBIAN BIOLOGICAL RECORDS**

Scale: 1:60,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 13/05/22	Date: 13/05/22	Date: 13/05/22	Date: 13/05/22

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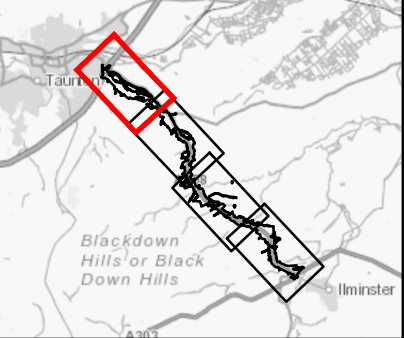
# Appendix B Waterbody location plan



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**LEGEND**

- ECOLOGY SURVEY ZONE
- ECOLOGY SURVEY ZONE BUFFER
- 250M (ONLINE SECTION)
- 500M (OFFLINE SECTION)
- POND
- DITCH



**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

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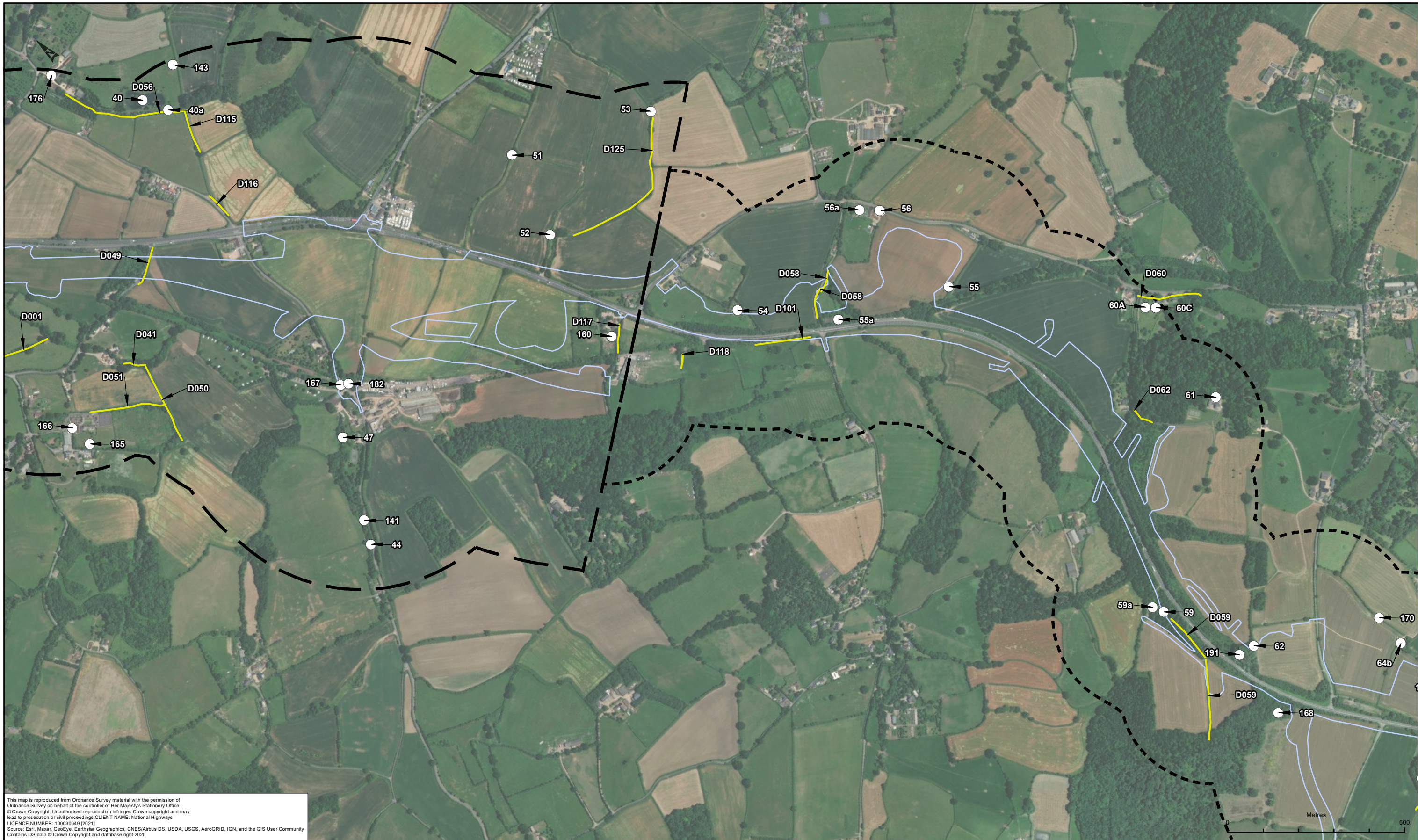
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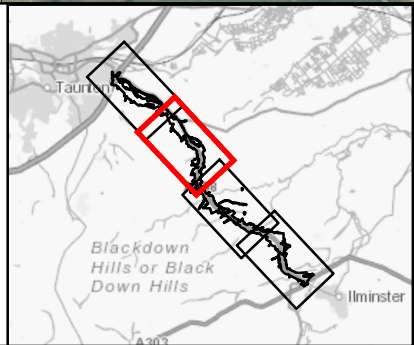




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**LEGEND**

- ECOLOGY SURVEY ZONE
- ECOLOGY SURVEY ZONE BUFFER
  - 250M (ONLINE SECTION)
  - 500M (OFFLINE SECTION)
- POND
- DITCH



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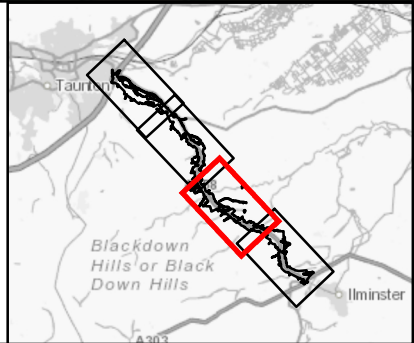
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Drawing Title: GREAT CRESTED NEWT WATERBODY SURVEY LOCATIONS SHEET 2 OF 4	
Scale: 1:10,000	By: JE
Original Size: A3	Date: 18/05/22
Checked: MA	Date: 18/05/22
Approved: JS	Date: 18/05/22
Authorised: SV	Date: 18/05/22
Drawing Number: HE551508 - ZZ	Revision: P02
Originator: ARP	Volume: VES
Type: -DR-LE-000187	Role: Number



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**LEGEND**

- ECOLOGY SURVEY ZONE
- ECOLOGY SURVEY ZONE BUFFER
- 250M (ONLINE SECTION)
- 500M (OFFLINE SECTION)
- POND
- DITCH



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	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

**TAYLOR WOODROW**  
together @ VINCI

**ARUP** **RAMBOLL**

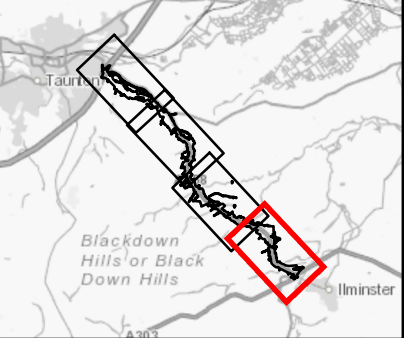
**national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME					
Drawing Title: GREAT CRESTED NEWT WATERBODY SURVEY LOCATIONS SHEET 3 OF 4					
Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV	
Original Size: A3	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22
Drawing Number: HE551508 - ZZ	HE PIN:	Originator: ARP	Volume: - VES	Revision: P02	
Location:	Type:	Role:	Number:	-DR - LE - 000188	



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- LEGEND**
- ECOLOGY SURVEY ZONE
  - ECOLOGY SURVEY ZONE BUFFER
  - 250M (ONLINE SECTION)
  - 500M (OFFLINE SECTION)
  - POND
  - DITCH



**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	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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**national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: GREAT CRESTED NEWT WATERBODY SURVEY LOCATIONS SHEET 4 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22

Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02
Location: ZZ	Type: -DR-LE-	Role: -000189	Number: P02

## Appendix C Waterbody descriptions summary table

Table C-1 Description of ponds and ditches

Waterbody ID no	Description of waterbodies
<b>Ponds</b>	
22	Large and deep dry ditch within scrubby hedgerow between pasture and arable.
24A	Lined pond in an ornamental garden, smooth newt seen during survey.
27	Small pond enclosed by hedgerow.
28	Small pond inside junction of hedgerows surrounded by pasture.
29	Pond inside small copse with pasture and hedgerows surrounding.
30A	Heavily vegetated man-made pond surrounded by scrub. Confirmed smooth newt present
30B	Well vegetated man-made pond with high density of bull rush surrounded by scrub
31	A large pond completely shaded by willow trees in the gardens on one bank and an arable field on the other, completely covered by duck weed. A small amount of emergent vegetation.
31A	Artificial pond in an ornamental garden with tussocky grassland, the garden is now derelict. Pond appears deep is lined and has some ornamental aquatic plants
32	Dry small 'former pond' in scrubby hedgerow between arable fields.
33	No pond present only dry ditch.
34	Large garden lined pond surrounded by amenity grass and some trees over hanging, small hedge on one side of pond, fair amount of macrophytes/pond weed, reeds, lily pads, blossom from trees on surface and some algae.
35	Dry pond/ditch located within woodland with rhododendron.
36A	Medium sized pond in woodland, shaded, little emergent veg
36B	Woodland pond with large amount of flag iris, steep bank in places, areas of open water.
37	Heavily silted with algae present, connected to ditches, high amount of veg around sides, which are steep.
38	Lots of bullrush, surrounded by very heavily grazed pasture and a central island with ducks.
40	Large pond/lake surrounded by amenity ornamental garden with hedgerows and arable land further afield. Marginal vegetation with none floating. Ducks and swans present.

Waterbody ID no	Description of waterbodies
40A	Pond surrounded by amenity ornamental garden with a hedgerow and arable on one side. Marginal vegetation with none floating. Dense sedges at narrow end. Connects to D115. Smooth newt eggs found.
44	Pond is actually a wider area of a flowing stream.
47	Nice large open water pond in pasture with a few trees around.
51	Tiny 5m x 1.5m pond in group of trees amongst arable fields. No vegetation.
52	Small pond in scrubby shallow woodland adjacent to arable fields. No vegetation, but areas of algae.
53	Narrow farm pond, blanket weed, minimal vegetation with scrub and tree shading.
54	Large garden pond with an island. Lots of waterfowl. Surrounded by mown lawn with some trees and hedge with trees along one side.
55	Small shallow pond in a copse, which is heavily shaded. At the edge of an agricultural field, the copse and pond form part of the hedgerow boundary of the field.
55A	Very large, deep pond next to road surrounded by dense scrub on the majority of the banks. Little to no vegetation present within water. Pond surrounded by arable land with some trees.
56	Small garden pond, which is lined with stoned sides, fully covered by duckweed. In back garden, overshadowed by fence.
56A	Pond not present.
59	Pond located in woodland with dense undergrowth and connected to ditches within woodland. Pond sedge, spiked sedge and bull rush present but a lack of aquatic vegetation
62	A medium sized pond in an area of woodland feeding stations indicate that the pond is heavily used by ducks and includes no vegetation.
64B	Pond located in the corner of an arable field over shadowed by willow trees and surrounded by mounds of dumped earth. Large amount of reed sweet grass, iris and blanket weed in the stagnant water, pond edges scrubby
65	Small pond between arable field joined by D122 and 189. Over shadowed by surrounding scrub, a large amount of reed sweet grass and blanket weed growing in cloudy water
67	Small pond at side of ploughed field surrounded by trees and scrub, which is covered in duckweed with no other aquatic plants visible. 50% access.
68	Pond at edge of field surrounded by trees and dense scrub. Heavily shaded with trees partially in water.
69	Dry muddy area at end of hedgerow.
69A	Pond not present – waterbody is sunken bathtub within private, farmhouse garden. well planted farmhouse garden.
69B	Ornamental garden pond with fish
69C	Ornamental garden koi pond
69D	No pond present.

<b>Waterbody ID no</b>	<b>Description of waterbodies</b>
69E	No pond present.
69F	No pond present.
70	No pond present.
80	Small wet copse of willow, which has silted up within pastoral farmland with hedges.
82	Small to medium sized pond surrounded by dense scrub, resulting in limited accessibility around sides. Old disused runoff pond from adjacent garage
83	Pond dry and silted up in an area of scrub on woodland edge.
84	Duck pond in garden.
84A	Pond situated within private garden
84B	Small concrete tank surrounded by an ornamental garden
84C	Ornamental pond situated within heavily planted garden, adjacent to pastoral fields. Notable presence of frog spawn.
86B	Pond adjacent to arable and pastoral farmland, connected by hedgerows, ditches and trees.
86C	No pond present.
90	Pond located inside copse of trees with adjacent road and agricultural buildings.
90A	Pond located inside copse of trees with adjacent road and agricultural buildings.
91	Pond located inside copse of trees with adjacent road and agricultural buildings.
91A	Pond located inside copse of trees with adjacent road and agricultural buildings.
92	Pond not present.
93	Pond not present.
94	Pond not present.
95	Small hallow pond within woodland with trees and tree debris, no vegetation and lots of leaf litter.
96	Tiny shallow patch of water in woodland 2m x 4m.
100	Willow copse in adjacent pastoral field with connecting hedgerow and ditches.
101	Woodland pond with trees and tree debris; layer of pollen on surface but no vegetation.
102	Pond within woodland completely covered by floating sweet grass. Smooth newt eggs found.
104	Large pond within woodland with trees and tree debris throughout.
105	Pond within woodland with very little vegetation within.

Waterbody ID no	Description of waterbodies
106	Pond of moderate size located within woodland with limited vegetation present.
107	Pond of moderate size with substantial duckweed present.
108	Small pond connected to D088A. Tree and scrub debris and some reeds but no other vegetation.
109	Small pond attached to ditch D088A surrounded by scrub and trees and pasture with little vegetation.
110	Small, flowing pond situated in small woodland off field edge.
111	Pond situated in a small scrubby woodland at the junction. Pond within scrubby area, few mature trees in middle of large field. Abundant leaf litter and dead wood however surrounding habitat less suitable.
112	Pond situated in a small scrubby woodland at the junction of 4 fields. Historically 3 individual ponds, however now one large pond. Abundant leaf litter and dead wood however surrounding habitat less suitable.
112B	Pond not present. Individual pond now merged into larger pond 112.
112C	Pond not present. Individual pond now merged into larger pond 112.
115A	Woodland pond. Pond situated in young woodland. Good terrestrial habitat with leaf litter, dead wood and mammal burrows present.
115B	Woodland pond situated in area of young woodland. Deadwood, leaf litter and mammal burrows present, good terrestrial habitat.
117	Pond situated at corner of arable field, immediately surrounded by tussocky grassland, wider habitat arable.
119	Pond not present.
119A	No distinct separate waterbody, forms part of wider ditch network
120	Large pond surrounded by scrub vegetation.
120A	Garden ornamental pond within woodland.
121	Dry pond in corner of field adjacent to a road, connected to dry ditch system.
122	Pond adjacent to scrub and heavily grazed field, situated at edge of chicken & goose farm.
123	Small pond at corner of 3 fields, scrubby vegetation, receiving a lot of silt from ploughed fields. Some leaf litter and dead wood present.
126	Pond within small copse adjacent to road with hedgerows and pasture.
126A	Small pond immediately adjacent 126 small copse next to road and pasture.
126B	Small copse adjacent to road and pasture
127	Pond inside small copse with pasture and hedgerows surrounding.
127A	Pond at ditch confluence within copse adjacent road and pasture.
127B	Pond located inside copse of trees with adjacent road.

Waterbody ID no	Description of waterbodies
128	Small pond inside small copse with arable land and hedgerows surrounding.
131A	Large pond over shaded by trees with two islands in the middle some duck weed water opaque but could be deep
129	Pond located within improved grassland field
132	Large, c-shaped pond, surrounded by emergent vegetation (pedunculate sedge, water dropwort, hemlock, <i>Typha</i> sp., <i>Epilobium</i> sp.) Young sapling trees surrounded by the copse to west and by a grassy ride with tussocky grassland to the south.
133	Small roadside pond completely covered by vegetation and algae with no proper terrestrial habitat.
133A	Pond not present.
135	Pond not present.
137	Drainage system connected by culverts adjacent road.
138	Pond not present.
139	Ornamental water feature with carp and netting around sides, concrete base. Steep concrete sides, difficult for newts to get in and out of pond. Shingle and ornamental garden surrounds.
140	Dry area where pond should be, located within pasture with connecting ditches and hedgerows.
141	Shallow pond, making up wider section of flowing stream, surrounded by little vegetation.
142	Large oblong drainage pond, with fluctuating levels of water with pipes to drain off. Pond surrounded by fencing and bramble with reasonably steep sides.
143	Dip in soil on a hill under oak tree.
145	Pond located within pastoral farmland, surrounded by adjacent hedges and fed by run off of nearby slurry heap.
145B	Same as 145, immediately adjacent Pastoral farmland, with hedges adjacent. road within 50 m. pond part of a series of 3 ponds for run off from slurry heap
145C	Very close to 145 and 145B. Same as 145 and 145B Pastoral farmland, with hedges adjacent. road within 50 m. pond part of a series of 3 ponds for run off from slurry heap
147	Pond situated within active farmland and surrounded by hedgerows.
148	Pond surrounded by hawthorn scrub and notable <i>salix</i> sp.
149	No pond present.
153	Pond situation in small scrubby woodland at edge of agricultural field. Within 5m of pond suitable habitat with leaf litter and dead wood but unsuitable beyond.
160	Dry ditch of leaf litter.



Waterbody ID no	Description of waterbodies
165	Ornamental pond in a garden under a weeping willow .
166	A small ornamental pond made of concrete with some aquatic plants and flower beds surrounding.
167	Large pond, steep scrubby banks, some pond weed, only accessible on two sides.
168	Pond in the middle of a coniferous plantation woodland. totally shaded no aquatic vegetation.
169	A concrete garden pond with a large amount of aquatic vegetation fish and tadpoles.
169	Lined pond in an ornamental garden with smooth newts observed.
170	Small, shallow pond directly adjacent to arable land, surrounded by hedgerow and hawthorn scrub.
171	Pond situated within arable field surrounded by marshy grassland. Area appears to be prone to flooding.
172	Pond presented as flood alleviation basin with adjacent stream situated within arable field, surrounded by a network of hedgerows and marshy grassland.
173	Waterbody situated in small area of scrubby woodland along road and field margin. Abundant leaf litter, dead wood present.
174	Small pond situated in small scrubby woodland at road edge and field margin. Abundant leaf litter and dead wood present.
175	Very shallow (c10cm) pond in woodland margin along road and adjacent to horse field.
176	Small pond in ornamental amenity gardens. Major waterfowl living on and around pond. Small amount of marginal vegetation (non-floating).
177	Small, raised ornamental pond situated within private garden, stocked with fish and minimal vegetation.
178	Small ornamental garden pond with some vegetation behind house
178	Very small garden pond 2m×2m with water feature some aquatic veg, bit of algae, lined, pebbles on one side
179	Small garden pond at front of house. Could not his properly until access was granted at a later date.
180	Pond located adjacent to semi-improved pasture and surrounded by blackthorn scrub. Waterbody subject to bull rush encroachment and substantial duckweed covering 95% of water.
181	Pond situated within woodland, surrounded by trees with some leaf litter. Little to no other vegetation present.
182	Large pond seems to be flooded hardstanding separated from main pond by manmade 1m land bridge. Substantial (90%) blanket weed with little other vegetation present.
183	Pond situated within pastoral farmland adjacent to hedgerow. Pond has undergone poaching by cattle.
185	Ornamental koi pond.
186	Small pond overshadowed by trees. Pond may become connected with surrounding nearby ponds via present ditches.
187	Medium pond in a woodland, surrounded by trees. next to another pond separated by shallow bank potentially can join together if water is high enough. Deadwood present within the pond.

<b>Waterbody ID no</b>	<b>Description of waterbodies</b>
188	Pond heavily shaded within woodland and located next to 187. Ponds are separated by shallow bank but could join following rain.
189	A small pond at the corner of an arable field a wider part of the ditch under the hedgerow choked by reed sweet grass.
190	Marshy pond area with flooded digger tracks, duckweed covered surface heavily vegetated 10 to 25cm deep surrounded by woodland.
191	Pond within woodland, muddy brown water, no aquatic vegetation
192	Pond adjacent footpath.
193	Raised garden pond.
<b>Ditches</b>	
D001	Same ditch as D046, a flowing stream.
D004	Ditch within pasture adjacent slurry heap.
D038	Ditch adjacent tall hedge with trees next to pasture. Long northern section dry and inaccessible as on building site. South-east section very shallow for majority of length, filled with leaf litter very little veg.
D039	Very shallow ditch with dry sections within arable fields with an adjacent hedge. Moderate floating veg and substantial blanket weed in areas. Deeper at East end.
D040	Road-side ditch adjacent arable field.
D041	Fast flowing stream in shallow woodland between pastures.
D042	Fast flowing brook situated between garden and road.
D043	Fast flowing brook situated between garden and road.
D044	Fast flowing brook situated between garden and road.
D045	Ditch adjacent to road, pasture and garden centre.
D046	Ditch holding flowing stream.
D047	Dry ditches within pasture surrounded by hedgerows.
D048	Ditch no longer present. Same brook as D045 but now buried.
D049	Dry roadside ditch adjacent to hedge, arable, and a small tree group.
D050	Ditch bordering an arable field on one side and an area of scrub on the other. Ditch is parallel to hedgerow and the scrub adjacent provides suitable terrestrial habitat.
D051	Shallow flowing water over shaded by trees and bordered by hedgerow borders a field of improved grassland on one side and an area of scrub on the other joins D051.
D052	Dry ditch ivy in area where ditch was surrounded by woodland strip, pasture adjacent.

Waterbody ID no	Description of waterbodies
D053	Small ditch parallel to roadside hedgerow.
D054	Dry ditch adjacent to houses and pasture.
D055	A shallow ditch between two improved grassland fields, largely flowing under a hedge. There is a large amount of in-channel vegetation (fools watercress, hemlock) which impedes the moderate flow of the water.
D056	Shallow ditch, hedge and arable adjacent, passes close to pond 40A but is very shallow, with moderate vegetation.
D058	Shallow roadside ditch flowing under a hedgerow with little in channel vegetation.
D059	Transiently wet ditch, which dries sporadically. Ditch is shaded by large quantities of hemlock and water dropwort.
D065	Shallow ditch in pasture, slow to moderate flow, lots of in channel vegetation, deep around culvert in middle of field, likely still dries annually. Dry patches toward southern end.
D065A	Shallow ditch with moderate flow, adjacent to hedgerow and pasture, with very little vegetation.
D067	Dry ditch full of leaf litter with very little other vegetation, situated adjacent to woodland and pasture.
D068	Almost dry ditch with no vegetation or cover with very sharp steep banks. Roadside, adjacent to pasture and shallow woodland at western end.
D069	Largely dry ditch with small, patchy areas of water less than 5cm in depth.
D070	Shallow drainage ditch heavily covered with blanket weed. Ditch is partly culverted and connects to river.
D071	Stream on field margin adjacent to hedgerow, moderate flow.
D072	Ditch between two agricultural fields shallow standing water with large amounts of vegetation reed sweet grass, dock, fools-watercress, and hemlock. dry in places wet at the corner
D075	Cluster of ditches that run along road. Overall, ditches are shallow and located between two arable fields under a hedgerow. Dense vegetation growing within the channel. More water present to the north-east end of the ditch, where it passes through a small copse of hazel, emerging onto the semi-improved grassland of the road verge.
D078	Shallow ditch with some moderate flow. Water depth is approximately 5 cm deep. Ditch is choked by bramble and accessible only in corner next to the road.
D080	Wet ditch which is part of/linked to D082, duckweed in northern end, clear southern end, steep sides border field, relatively deep in places.
D081	Dry ditch recently dredged near a small copse and the garden of the adjacent property.
D082	Wet ditch adjacent road and farm buildings with hedgerows and amenity grassland.
D083	Heavily scrubbed up ditch largely dry, small pools of water max 5cm depth.
D084	Dry adjacent to pasture and garden.
D085	Moderate flowing stream along field margin perpendicular to D085A.

<b>Waterbody ID no</b>	<b>Description of waterbodies</b>
D085A	Moderate flowing stream along field margin and roadside.
D086	Dry ditch present.
D087A	Dry ditch along field margin.
D087B	Shallow ditch at edge of small scrubby woodland and along field margin.
D087C	Dry ditch at field margin and edge of small scrubby woodland.
D087D	Shallow ditch along roadside and hedgerow on field margin.
D088	Very shallow ditch with some flow adjacent to hedgerow and pasture.
D088A	Very shallow, hedge and pasture adjacent, connected to ponds 108 and 109. Lots of water parsnip present.
D089	Heavily vegetated, very shallow, some flow, roadside, hedge and pasture adjacent.
D089A	Heavily vegetated ditch situated roadside with slow, shallow flow. Ditch is separated from D089 by dry section/culvert. Hedgerow and pasture adjacent.
D093	Brook situated within small woodland, and leads to road with culvert.
D099	Ditch running parallel to hedgerow and located between pastoral field and road.
D100	Very shallow ditch adjacent to pastoral fields and hedgerow.
D101	Ditch with moderate flow, situated adjacent to pasture and scrub habitat.
D102	Very shallow ditch with moderate flow with notable scrub adjacent.
D103	Moderate flowing ditch adjacent to scrub and unimproved grassland.
D107	Ditch between two agricultural fields under a hedge/line of trees. Ditch has been dredged from the west very little vegetation 50% dry from the southern edge.
D108	Ditch located within pasture with hedgerows
D109	Ditch does not exist as land has been renovated.
D110	Dry ditch with terrestrial vegetation growing.
D111	Ditch at agricultural field margin adjacent to hedgerow. Intermittently holds water depth of around 5cm in part.
D112	Dry ditch adjacent to road and hedgerow on field margin.
D113	Dry ditch adjacent to hedgerow intersecting arable fields.
D114	Ditch surrounding small copse.
D114	Roadside ditch, grass verge and scrub hedge adjacent, very shallow, poor water quality.

Waterbody ID no	Description of waterbodies
D115	Wet ditch at northern end but dries out for most of ditch. Ditch is attached to pond 40A, with adjacent hedgerow and arable. Suitable habitat at north end but less so for the rest.
D117	Shallow ditch adjacent to road and hedgerow, with moderate flow at NE end. Ditch deepens with good grass vegetation elsewhere.
D118	Shallow ditch low flow from spring, adjacent to hedgerow and pasture surrounded by vegetation.
D119	Roadside shallow ditch adjacent to hedgerow and pasture, with moderate vegetation and clean water. Ditch is also connected to D065.
D120	Shallow ditch situated within arable land and adjacent to hedgerow. Ditch is heavily vegetated with fool's watercress.
D121	Deep ditch located by hedgerow within arable fields. Some marginal and floating vegetation present and ditch has moderate flow.
D122	Very shallow ditch filled with vegetation situated beneath hedgerow and between arable fields.
D123	Shallow roadside ditch adjacent to hedge and pasture.
D124	Very shallow ditch with dry patches. Ditch is adjacent to roadside, hedgerow and pastures.
D125	Moderate flow ditch between two arable fields.
D126	Ditch situated within pastoral field and adjacent to hedgerow.
D127	Ditch situated within pastoral field and adjacent to hedgerow.
D128	Ditch situated within pastoral field and adjacent to hedgerow.
D129	Wide ditch situated within pastoral field and adjacent to hedgerow.
D130	Ditch running alongside an improved grassland field with dry patches to the east.
D131	Shallow ditch between two agricultural fields and located under a hedgerow.
D132	Ditch with moderate to strong flow separating woodland from ploughed field.
D133	Ditch running through centre of woodland with a wider wet section where ditch meets dry ditches. Shallow water, shaded by wood with small amount of emergent vegetation.
D134	Shallow ditch along hedgerow adjacent to pasture and heavily vegetated with sedges.
D135	Drainage ditch at side of road which extends into active construction site. Water quality appears poor.
D136	Cattle poached ditch on field margin surrounded by hedgerow, with high turbidity, however dry patches present.

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# Appendix D Habitat suitability index assessment summary table

Waterbody ID	Survey date	HSI score
<b>Ponds</b>		
22	31/03/2021	N/A – Pond dry
27	26/03/2021	0.60
28	26/03/2021	0.42
29	26/03/2021	0.58
30A	07/04/2021	0.68
30B	31/03/2021	0.70
31	13/05/2021	0.48
31A	21/05/2021	0.63
32	13/05/2021	N/A – Pond dry
33	21/05/2021	N/A – Only dry ditch present
34	30/03/2021	0.62
35	31/03/2021	N/A – Pond dry
36A	26/03/2021	0.57
36B	26/03/2021	0.67
37	26/03/2021	0.58
38	26/03/2021	0.64
40	26/03/2021	0.45
40A	26/03/2021	0.63
44	26/03/2021	N/A – Pond part of fast flowing stream
47	26/03/2021	0.68
51	22/06/2021	0.38

Waterbody ID	Survey date	HSI score
52	24/06/2021	0.37
53	30/04/2021	0.41
54	23/06/2021	0.49
55	01/04/2021	0.36
55A	26/03/2021	0.60
56	26/03/2021	0.55
56A	23/04/2021	N/A – No longer present
59	13/05/2021	0.74
59A	18/06/2021	0.68
62	31/03/2021	0.36
64B	25/03/2021	0.61
65	25/03/2021	0.60
67	25/03/2020	0.46
68	25/03/2021	0.53
69	25/03/2021	N/A – Pond dry
69A	25/03/2021	0.67
69B	25/03/2021	0.35
69C	25/03/2021	0.34
69D	25/03/2021	N/A – No longer present
69E	25/03/2021	N/A – No longer present
69F	25/03/2021	N/A – No longer present
70	25/03/2021	N/A – Pond dry



Waterbody ID	Survey date	HSI score
80	25/03/2021	N/A – Pond dry
82	25/03/2021	0.62
83	25/03/2021	N/A – Pond dry
84	26/03/2021	0.31
84A	26/03/2021	N/A – Pond dry
84B	23/03/2021	0.47
84C	23/03/2021	0.42
86B	23/03/2021	0.60
86C	23/03/2021	N/A – No longer present
90	24/03/2021	0.56
90A	24/03/2021	0.50
91	24/03/2021	0.61
91A	23/03/2021	0.61
92	23/03/2021	N/A – No longer present
93	24/03/2021	N/A – No longer present
94	23/03/2021	N/A – No longer present
95	01/04/2021	0.43
96	01/04/2021	0.43
99	01/04/2021	0.47
100	01/04/2021	0.71
101	25/03/2021	0.48
102	25/03/2021	0.51

Waterbody ID	Survey date	HSI score
104	25/03/2021	0.57
105	29/03/2021	0.62
106	26/03/2021	0.53
107	26/03/2021	0.58
108	26/03/2021	0.42
109	26/03/2021	0.49
110	21/05/2021	0.43
111	30/03/2021	0.61
112	31/03/2021	0.61
112B	25/06/2021	N/A – Merged into larger pond 112
112C	30/03/2021	N/A – Merged into larger pond 112
115	25/03/2021	0.59
115A	25/03/2021	0.52
115B	25/03/2021	0.48
116	25/03/2021	0.69
117	23/03/2021	0.74
119	29/03/2021	0.61
119A	22/04/2021	N/A – no distinct pond, forms part of ditch network.
120	22/04/2021	0.44
120A	26/03/2021	0.59
121	26/03/2021	N/A – Pond dry
122	30/04/2021	0.39

Waterbody ID	Survey date	HSI score
123	22/04/2021	0.42
126	30/04/2021	0.73
126A	24/03/2021	0.58
126B	24/03/2021	0.58
127	24/03/2021	0.58
127A	24/03/2021	0.70
127B	30/03/2021	0.58
128	31/03/2021	0.68
129	31/03/2021	N/A – No longer present
131	21/05/2021	N/A – Pond dry
131A	21/05/2021	0.74
132	31/03/2021	0.63
133	25/03/2021	0.44
133A	26/03/2021	N/A – No longer present
133C	26/03/2021	N/A – No longer present
135	25/03/2021	N/A – No longer present
137	31/03/2021	0.53
138	25/03/2021	N/A – Part of flowing drainage system
139	26/03/2021	0.33
140	26/03/2021	N/A – Pond dry
141	01/04/2021	N/A – Part of flowing stream
142	23/04/2021	0.57

Waterbody ID	Survey date	HSI score
143	23/06/2021	N/A – No longer present
145	30/04/2021	0.62
145B	22/04/2021	0.59
145C	23/03/2021	0.38
147	23/03/2021	N/A – No longer present
148	23/03/2021	N/A – Pond dry
149	23/03/2021	N/A – Pond dry
153	24/03/2021	0.55
160	15/04/2021	N/A – No longer present
165	01/04/2021	N/A – Fast flowing stream, no pond present.
166	01/04/2021	0.36
167	01/04/2021	0.57
168	01/04/2021	0.37
169	25/03/2021	0.59
170	25/03/2021	0.52
171	25/03/2021	0.53
173	30/04/2021	0.46
174	26/03/2021	0.40
175	26/03/2021	0.40
176	07/04/2021	0.34
177	13/05/2021	0.34
178	13/05/2021	0.59

Waterbody ID	Survey date	HSI score
179	30/03/2021	N/A – Small ornamental garden pond
180	26/03/2021	0.55
181	16/04/2021	0.49
182	24/06/2021	0.56
183	01/04/2021	0.47
185	25/03/2021	0.27
186	31/03/2021	0.56
187	31/03/2021	0.37
188	25/03/2021	0.36
189	25/03/2021	0.47
190	25/03/2021	0.51
191	31/03/2021	0.56
192	25/03/2021	N/A – Pond dry
193	25/03/2021	0.64
<b>Ditches</b>		
D001	14/05/2021	N/A – Flowing stream
D004	23/04/2021	0
D038	23/04/2021	-6
D039	29/03/2021	-2
D040	28/03/2021	-2
D041	25/03/2021	N/A – Fast flowing stream
D042	25/03/2021	N/A – Fast flowing stream

Waterbody ID	Survey date	HSI score
D043	28/03/2021	N/A – Fast flowing stream
D044	28/03/2021	N/A – Fast flowing stream
D045	28/03/2021	N/A – Flowing stream
D046	25/03/2021	N/A – Flowing stream
D047	28/03/2021	N/A – Dry ditch
D048	28/03/2021	N/A – No longer present
D049	28/03/2021	N/A – Dry ditch
D050	31/03/2021	N/A – Fast flowing
D051	31/03/2021	N/A – Fast flowing
D052	29/03/2021	N/A – Dry ditch
D053	29/03/2021	N/A – No longer present
D054	29/03/2021	N/A – Dry ditch
D055	29/03/2021	0
D056	25/03/2021	-2
D058	25/03/2021	3
D059	25/03/2021	-4
D065	25/03/2021	2
D065A	30/04/2021	N/A – Flowing ditch
D067	30/03/2021	N/A – Dry ditch
D068	25/03/2021	N/A – Dry ditch
D069	30/03/2021	N/A – Dry ditch
D070	29/03/2021	-4

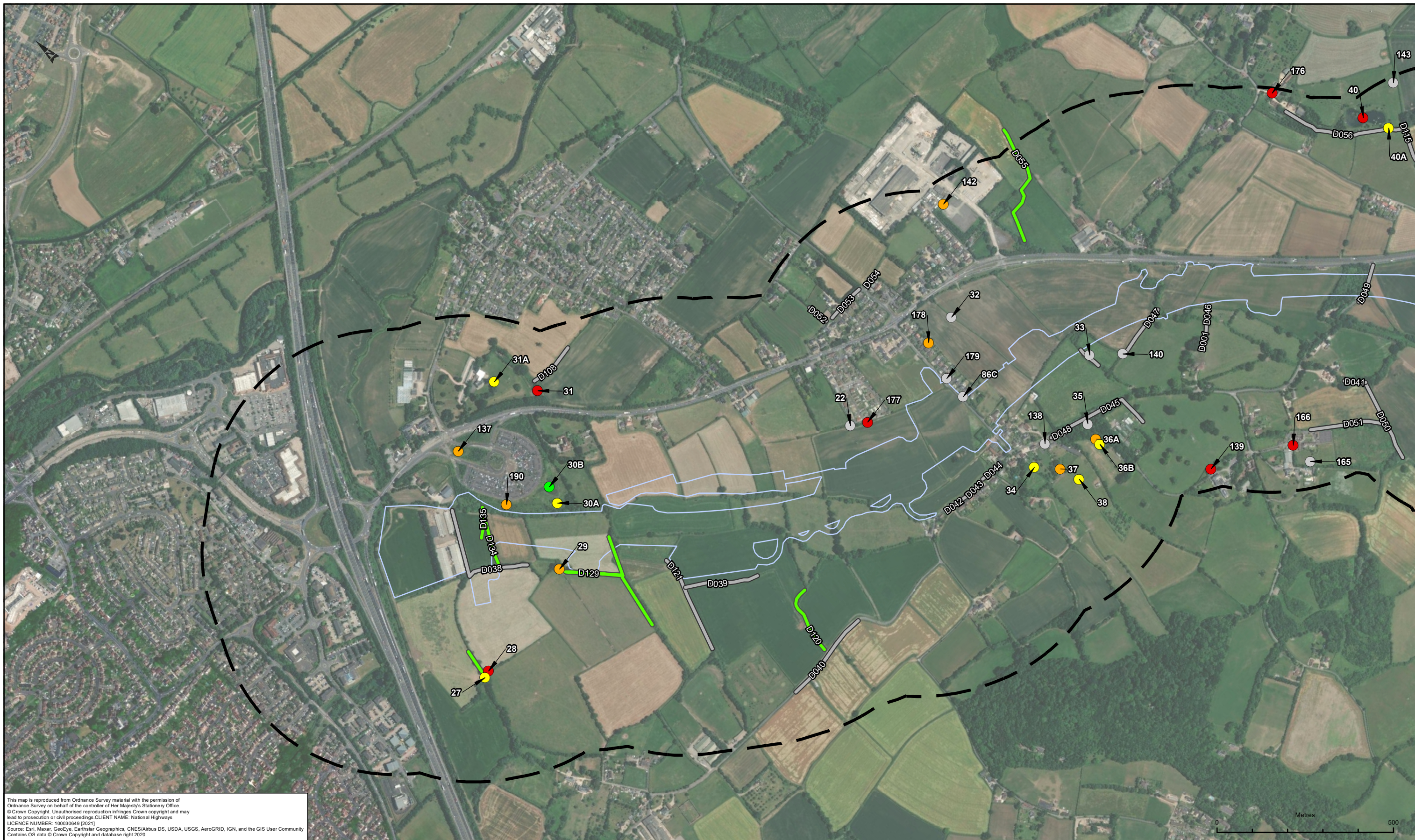
Waterbody ID	Survey date	HSI score
D071	29/03/2021	N/A – Flowing ditch
D072	25/03/2021	5
D075A	25/03/2021	-2
D075B	25/03/2021	-4
D075C	28/03/2021	N/A – Dry ditch
D078	28/03/2021	-2
D080	28/03/2021	3
D081	28/03/2021	N/A – Dry ditch
D082	28/03/2021	0
D083	28/03/2021	-4
D084	25/03/2021	N/A – Dry ditch
D085	25/03/2021	N/A – Flowing stream
D085A	25/03/2021	N/A – Flowing stream
D086	25/03/2021	N/A – Dry ditch
D087	25/03/2021	-2
D088	25/03/2021	-2
D088A	01/04/2021	0
D089	30/04/2021	N/A – Dry ditch
D089A	25/03/2021	0
D093	25/03/2021	N/A – Flowing stream
D099	25/03/2021	N/A – Fast flowing stream
D100	25/03/2021	-2

Waterbody ID	Survey date	HSI score
D101	25/03/2021	N/A – Moderate flow
D102	25/03/2021	N/A – Moderate flow
D103	25/03/2021	N/A – Moderate flow
D107	25/03/2021	-2
D108	28/03/2021	N/A – Moderate flow
D109	28/03/2021	N/A – No longer exists
D110	29/03/2021	N/A – Dry ditch
D111	29/03/2021	0
D112	22/06/2021	N/A – Dry ditch
D113	05/04/2021	N/A – Dry ditch
D115	05/04/2021	-2
D117	29/03/2021	0
D118	05/04/2021	3
D119	28/03/2021	N/A – Moderate to high flow
D120	05/04/2021	0
D121	23/04/2021	N/A – Moderate flow
D123	08/04/2021	-2
D124	08/04/2021	-2
D125	29/03/2021	N/A – Flowing stream
D126	28/03/2021	0
D127	30/03/2021	0
D128	30/03/2021	0



<b>Waterbody ID</b>	<b>Survey date</b>	<b>HSI score</b>
D129	28/03/2021	5
D130	28/03/2021	0
D131	28/03/2021	0
D132	28/03/2021	N/A – No longer exists
D133	28/03/2021	-4
D134	31/03/2021	2
D135	28/03/2021	1
D136	23/04/2021	-4

# Appendix E GCN habitat suitability index assessment score results plan



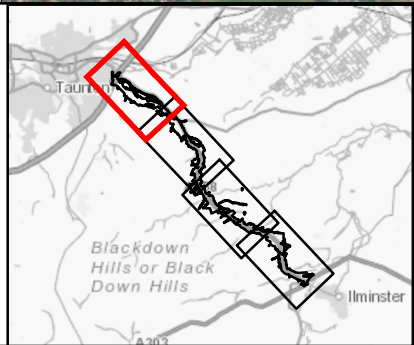
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**LEGEND**

**ECOLOGY SURVEY ZONE BUFFER**  
 500M (OFFLINE SECTION)  
 ECOLOGY SURVEY ZONE

**DITCH HSI SCORE**  
 SUITABLE FOR GCN  
 NOT SUITABLE FOR GCN  
 NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT

**POND HSI SCORE**  
 EXCELLENT  
 GOOD  
 AVERAGE  
 BELOW AVERAGE  
 POOR  
 NOT SUITABLE  
 NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



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

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
 Drawing Status: SUITABLE FOR INFORMATION

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Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

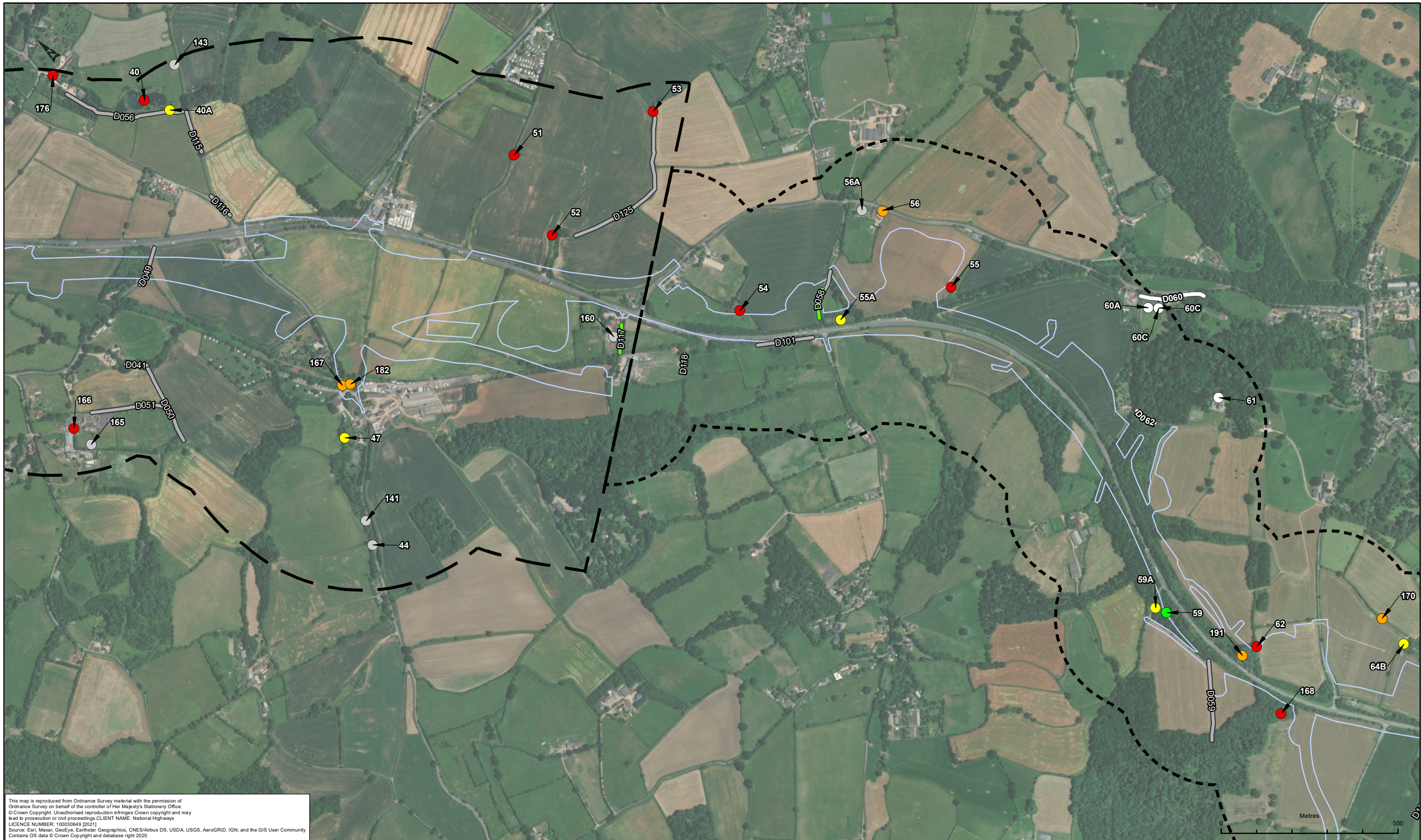
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Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22

Drawing Number: HE551508 - ZZ  
 HE PIN: ZZ  
 Location: ZZ

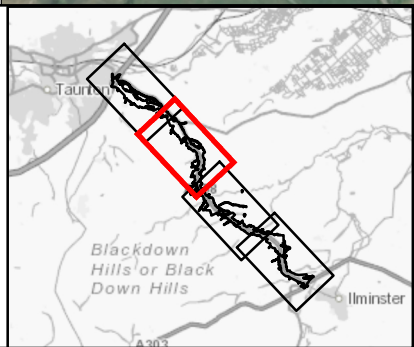
Originator: ARP  
 Volume: VES  
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 Role: -  
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Revision: P02



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LEGEND	
<b>ECOLOGY SURVEY ZONE BUFFER</b>	<b>POND HSI SCORE</b>
250M (ONLINE SECTION)	GOOD
500M (OFFLINE SECTION)	AVERAGE
ECOLOGY SURVEY ZONE	BELOW AVERAGE
<b>DITCH HSI SCORE</b>	POOR
SUITABLE FOR GCN	NOT SUITABLE
NOT SUITABLE FOR GCN	NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT	



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
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CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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Project Title		Drawing Title	
A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME		GREAT CRESTED NEWT HABITAT SUITABILITY INDEX ASSESSMENT SCORE SHEET 2 OF 4	
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Original Size: A3	Date: 18/05/22	Date: 18/05/22	Date: 18/05/22
Authorised: SV			
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02
Location:	Type: -DR-LE-000145	Role:	Number:



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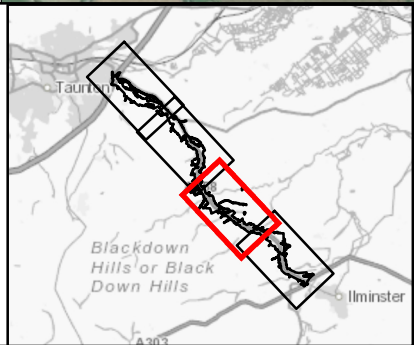
**LEGEND**

**ECOLOGY SURVEY ZONE BUFFER**  
 [Dashed line] 250M (ONLINE SECTION)  
 [Solid line] ECOLOGY SURVEY ZONE

**DITCH HSI SCORE**  
 [Green line] SUITABLE FOR GCN  
 [Grey line] NOT SUITABLE FOR GCN

**NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT**  
 [Dashed line]

**POND HSI SCORE**  
 [Blue circle] EXCELLENT  
 [Green circle] GOOD  
 [Yellow circle] AVERAGE  
 [Orange circle] BELOW AVERAGE  
 [Red circle] POOR  
 [Grey circle] NOT SUITABLE  
 [White circle] NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



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

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
 Drawing Status: SUITABLE FOR INFORMATION

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Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

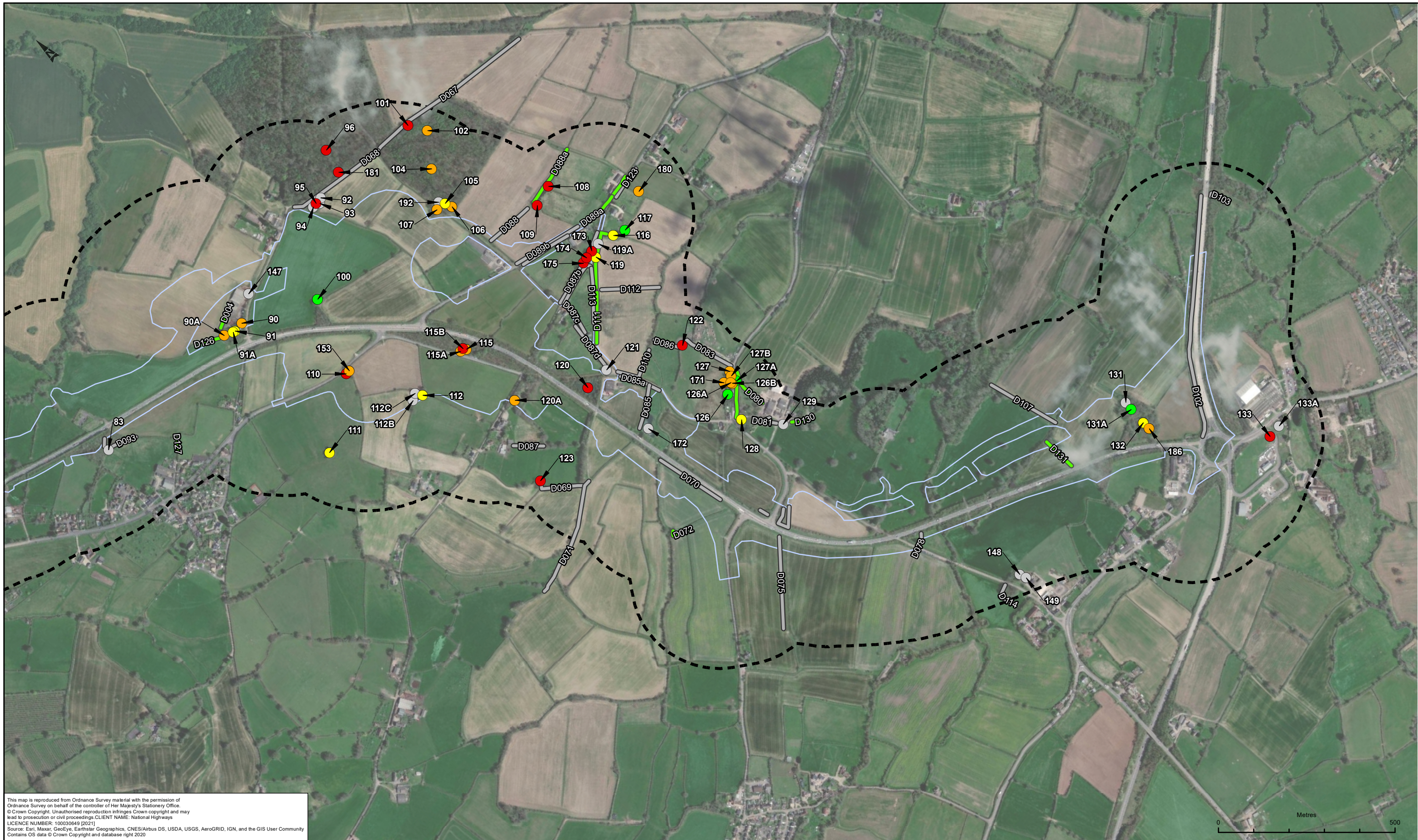
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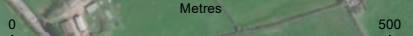
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 Location: ZZ

Originator: ARP  
 Volume: VES  
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 Role: LE-  
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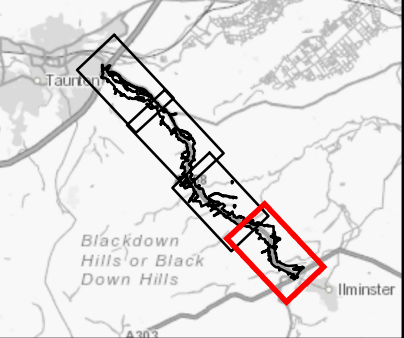
Revision: P02



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LEGEND	
<b>ECOLOGY SURVEY ZONE BUFFER</b>	<b>POND HSI SCORE</b>
250M (ONLINE SECTION)	EXCELLENT
ECOLOGY SURVEY ZONE	GOOD
<b>DITCH HSI SCORE</b>	AVERAGE
SUITABLE FOR GCN	BELOW AVERAGE
NOT SUITABLE FOR GCN	POOR
NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT	NOT SUITABLE
NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT	NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

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MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	18/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2 Drawing Status: SUITABLE FOR INFORMATION

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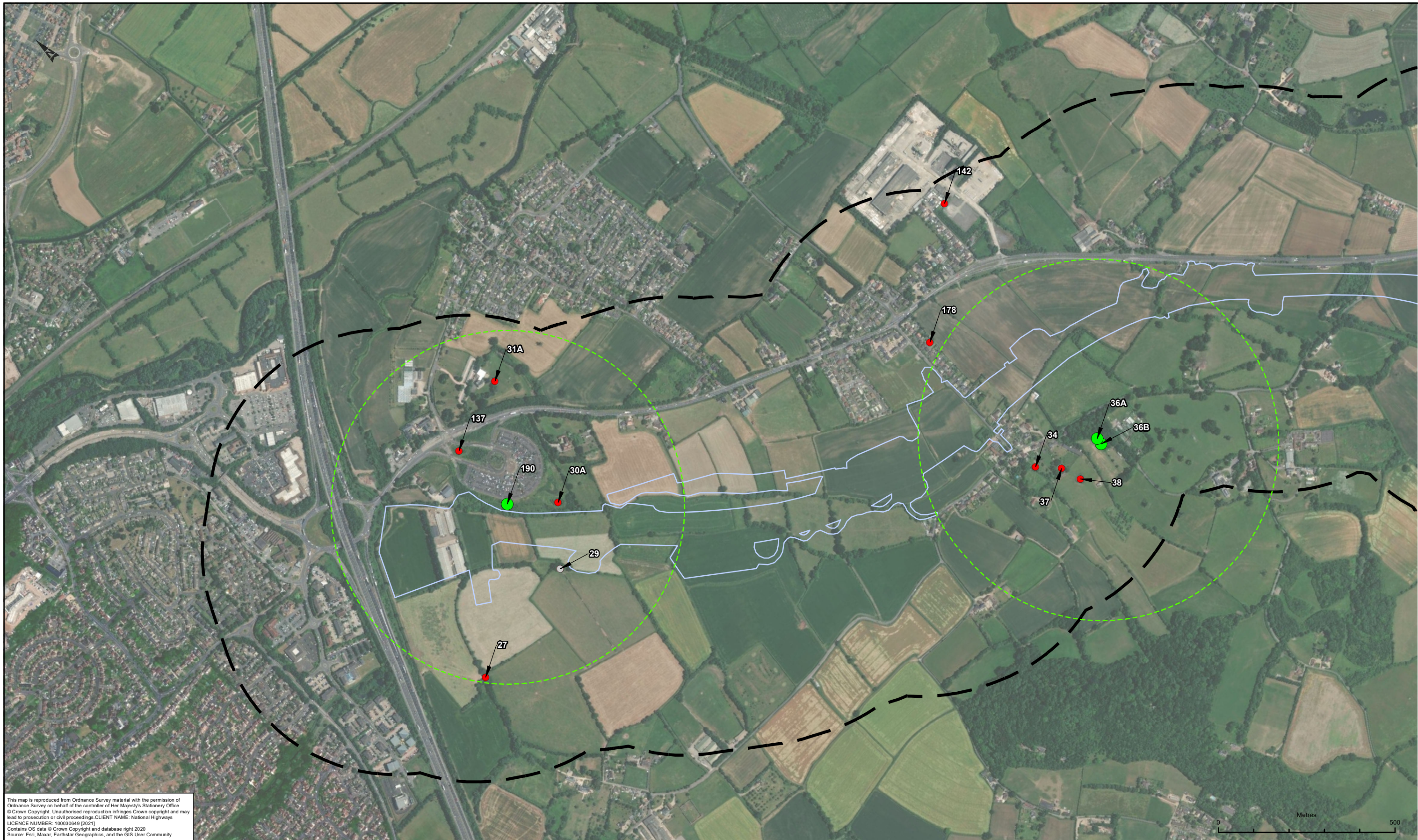
**ARUP** **RAMBOLL**

**national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME					
Drawing Title: GREAT CRESTED NEWT HABITAT SUITABILITY INDEX ASSESSMENT SCORE SHEET 4 OF 4					
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Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02		Location: -DR - LE - 000147
Type: ZZ	Role: -	Number: -			

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# Appendix F eDNA survey results plan



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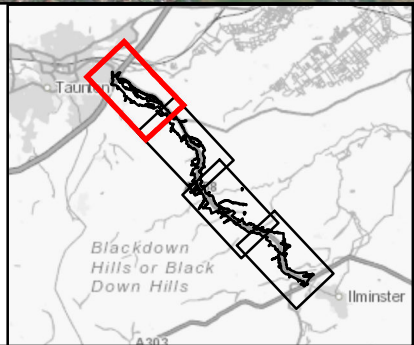
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**ECOLOGY SURVEY ZONE BUFFER**

- 500M (OFFLINE SECTION)
- ECOLOGY SURVEY ZONE
- POSITIVE eDNA RESULT 500M BUFFER

**eDNA RESULT**

- POSITIVE
- NEGATIVE
- INCONCLUSIVE
- DRY POND
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

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MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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Client: **national highways**

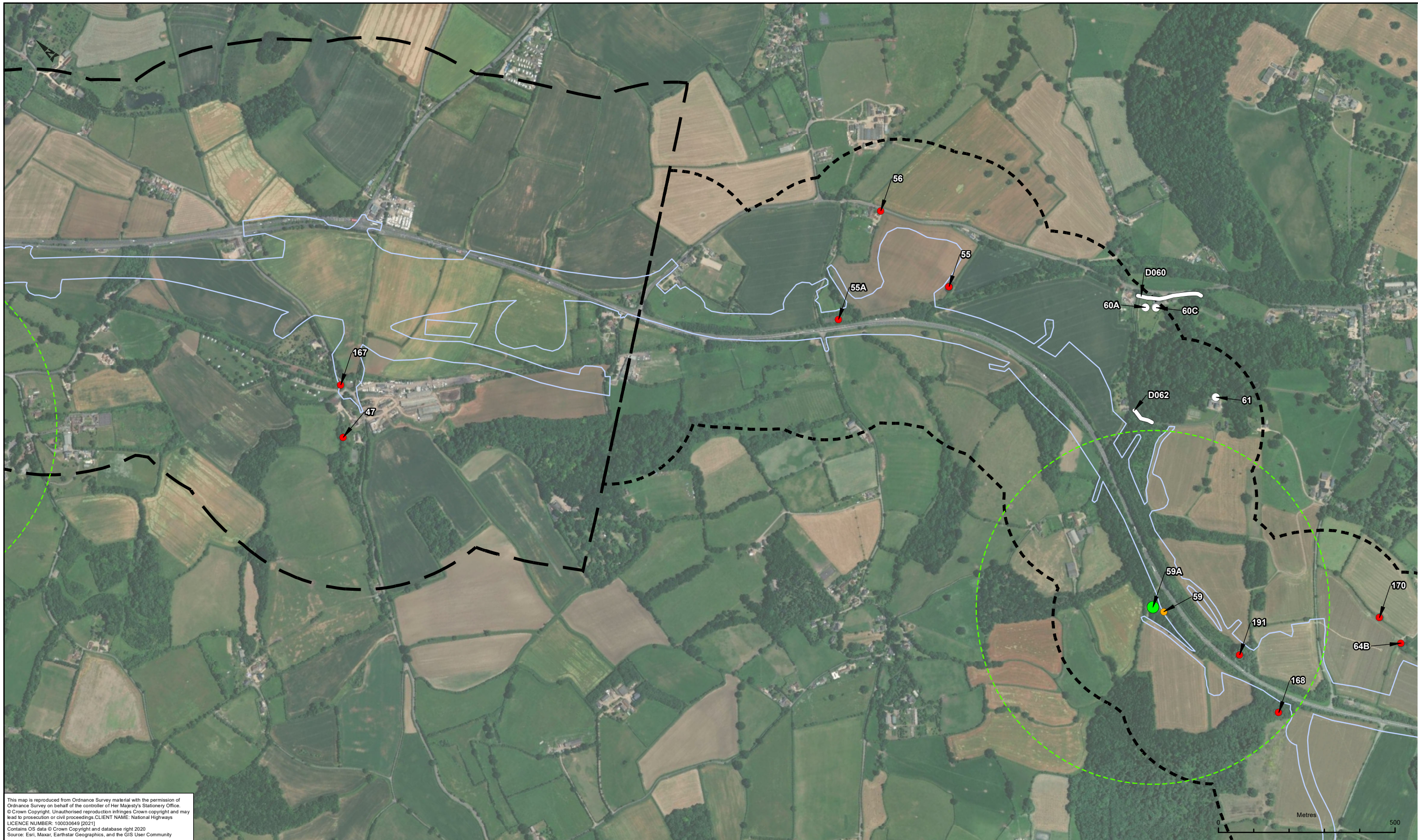
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Drawing Title: GREAT CRESTED NEWT eDNA SURVEY RESULTS SHEET 1 OF 4

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Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22

Drawing Number: HE551508 - ZZ	HE PIN:	Originator: ARP	Volume: - VES	Revision: P02
Location: ZZ	Type:	Role: - DR - LE - 000148	Number:	





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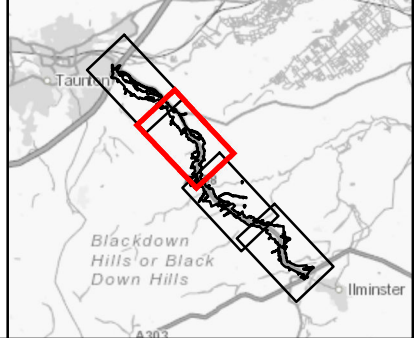
**LEGEND**

**ECOLOGY SURVEY ZONE BUFFER**

- 250M (ONLINE SECTION)
- 500M (OFFLINE SECTION)
- ECOLOGY SURVEY ZONE
- POSITIVE eDNA RESULT 500M BUFFER

**eDNA RESULT**

- POSITIVE
- NEGATIVE
- INCONCLUSIVE
- DRY POND
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

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

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2 | Drawing Status: SUITABLE FOR INFORMATION

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**ARUP** | **RAMBOLL**

Client: **national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: GREAT CRESTED NEWT eDNA SURVEY RESULTS SHEET 2 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
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Location: ZZ	Type: -DR	Role: LE	Number: 000149	



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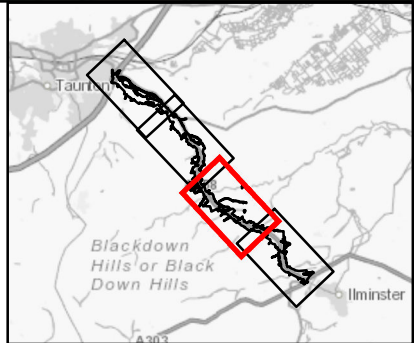
**LEGEND**

**ECOLOGY SURVEY ZONE BUFFER**

- 250M (ONLINE SECTION)
- ECOLOGY SURVEY ZONE
- POSITIVE eDNA RESULT 500M BUFFER

**eDNA RESULT**

- POSITIVE
- NEGATIVE
- INCONCLUSIVE
- DRY POND
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**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	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

**TAYLOR WOODROW**  
together @ VINCI

**ARUP** **RAMBOLL**

Client: national highways

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: GREAT CRESTED NEWT eDNA SURVEY RESULTS SHEET 3 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: - VES	Revision: P02	
Location: ZZ	Type: -DR	Role: -LE	Number: -000150	



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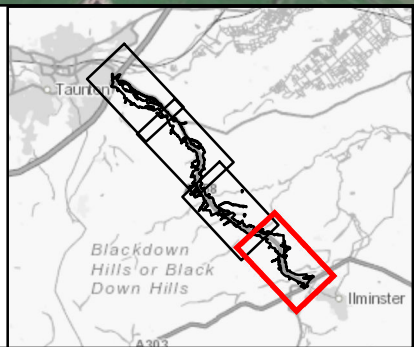
**LEGEND**

**ECOLOGY SURVEY ZONE BUFFER**

- 250M (ONLINE SECTION)
- ECOLOGY SURVEY ZONE
- POSITIVE eDNA RESULT 500M BUFFER

**eDNA RESULT**

- POSITIVE
- NEGATIVE
- INCONCLUSIVE
- DRY POND
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**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

Suitability: S2 Drawing Status: SUITABLE FOR INFORMATION

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**ARUP** **RAMBOLL**

Client: **national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: GREAT CRESTED NEWT eDNA SURVEY RESULTS SHEET 4 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22

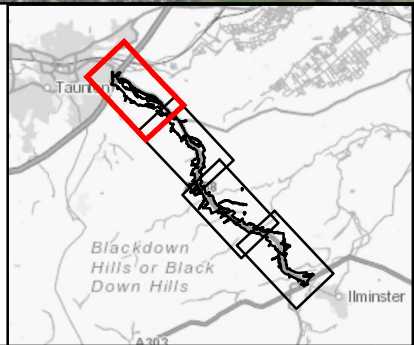
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02
Location: ZZ	Type: -DR-LE-000151	Role: -	Number: -

# Appendix G GCN population size class survey plan



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LEGEND	
500M (OFFLINE SECTION) BUFFER	SCOPED OUT FOLLOWING HSI AND eDNA SURVEYS
ECOLOGY SURVEY ZONE	NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
GCN PRESENCE CONFIRMED 500M BUFFER	NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
PRESENT	
ABSENT	



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

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

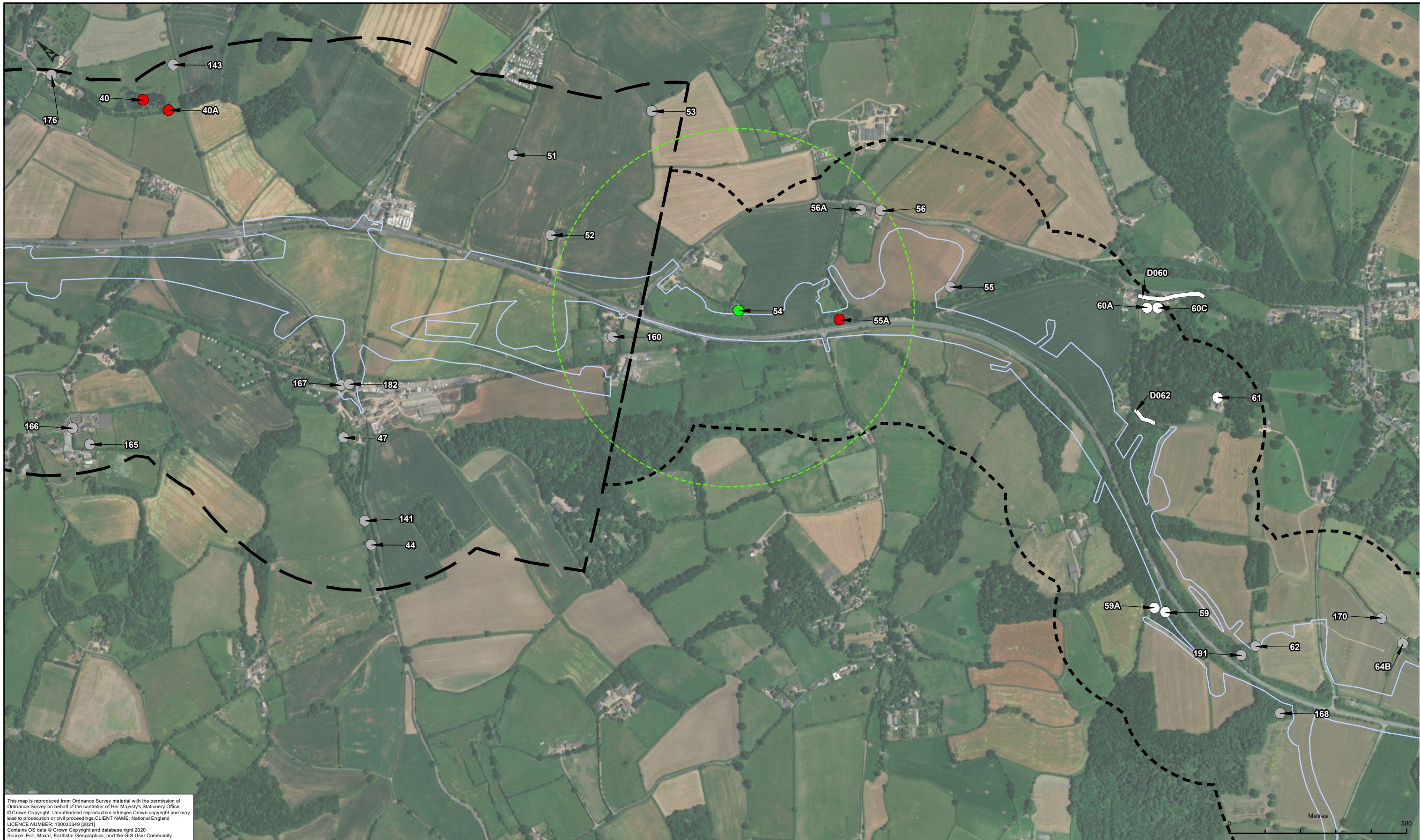
Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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**national highways**

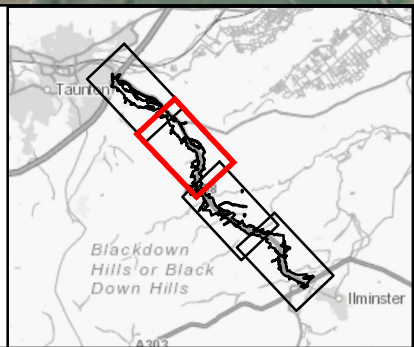
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Drawing Title: GREAT CRESTED NEWT POPULATION SIZE CLASS RESULTS SHEET 1 OF 4					
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1:10,000	JE	MA	JS	SV	
Original Size	Date	Date	Date	Date	Date
A3	20/05/22	20/05/22	20/05/22	20/05/22	20/05/22
Drawing Number	HE PIN	Originator	Volume	Revision	
HE551508 - ZZ		ARP	VES	P02	
Location	Type	Role	Number		



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**LEGEND**

- 250M (ONLINE SECTION)
- 500M (OFFLINE SECTION)
- ECOLOGY SURVEY ZONE
- GCN PRESENCE CONFIRMED 500M BUFFER
- PRESENT
- ABSENT
- SCOPED OUT FOLLOWING HSI AND eDNA SURVEYS
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT
- NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT



**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

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

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2 | Drawing Status: SUITABLE FOR INFORMATION

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**national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

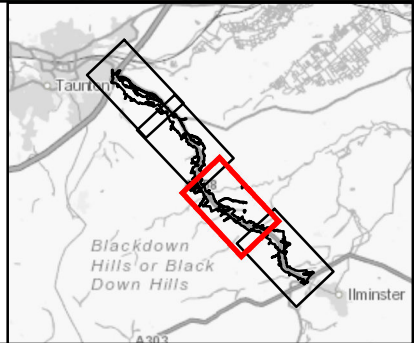
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Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02	
Location: ZZ	Type: -DR	Role: -LE	Number: 000153	



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LEGEND	
<ul style="list-style-type: none"> <li>250M (ONLINE SECTION)</li> <li>ECOLOGY SURVEY ZONE</li> <li>GCN PRESENCE CONFIRMED 500M BUFFER</li> <li>PRESENT</li> <li>ABSENT</li> </ul>	<ul style="list-style-type: none"> <li>SCOPED OUT FOLLOWING HSI AND eDNA SURVEYS</li> <li>NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT</li> <li>NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT</li> </ul>



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
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CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P02	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

**TAYLOR WOODROW**  
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**ARUP** **RAMBOLL**

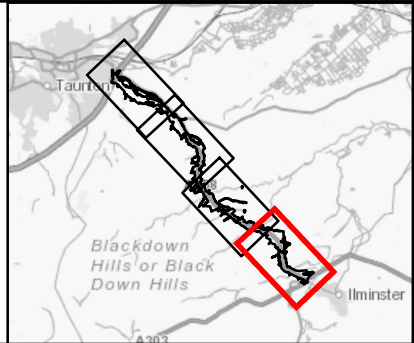
**national highways**

Project Title		Drawing Title	
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Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Authorised: SV	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: - DR - LE - 000154	Revision: P02
HE PIN	Type	Role	Number



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LEGEND	
<ul style="list-style-type: none"> <li>ECOLOGY SURVEY ZONE BUFFER</li> <li>250M (ONLINE SECTION)</li> <li>ECOLOGY SURVEY ZONE</li> <li>GCN PRESENCE CONFIRMED 500M BUFFER</li> <li>PRESENT</li> <li>ABSENT</li> </ul>	<ul style="list-style-type: none"> <li>SCOPED OUT FOLLOWING HSI AND eDNA SURVEYS</li> <li>NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT</li> <li>NO LAND ACCESS - POTENTIAL FOR GCN TO BE PRESENT</li> </ul>



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	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
 Drawing Status: SUITABLE FOR INFORMATION  
 Client: ARUP RAMBOLL  
 national highways

Project Title		Drawing Title	
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Scale: 1:10,000	By: JE	Checked: MA	Approved: JS
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
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Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P02
Location: ZZ	Type: -DR-LE-	Role: -000155	Number: P02



# Appendix H GCN population size class survey results

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions (a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
30B	1	19/04/2021 Bottle Trapping, Egg Search, Torching	a = 5 b = 5 c = 100	a = 100 b = Moderate c = Heavy, persistent	9.8 / 9.8	0	0	0	0	0
	2	28/04/2021 Torching, Bottle Trapping, Egg Search	a = 4 b = 1 c = 70	a = 0 b = Light c = 0	13 / 13	0	1	3	0	0
	3	06/05/2021 Torching, Egg Search, Refuge Search	a = 1 b = 2 c = 0	a = 0 b = Light c = 0	7 / 7	0	0	0	0	0
	4	13/05/2021 Bottle Trapping, Torching, Egg Search	a = 4 b = 2 c = 0	a = 100 b = Light c = Light, short showers	10 / 10	0	0	0	3	0
40	1	26/04/2021 Bottle Trapping, Torching, Egg Search	a = 1 b = 3 c = 35	a = 0 b = Light c = 0	14 / 14	0	0	0	2	1
	2	04/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 2 c = 35	a = 0 b = Light c = 0	8 / 8	0	0	2	2	25
	3	10/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 2 c = 35	a = 0 b = None c = 0	12 / 12	0	5	2	100	9
	4	17/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 3 c = 35	a = 5 b = Light c = 0	11 / 11	0	0	0	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
40A	1	27/04/2021 Torching, Bottle Trapping, Egg Search	a = 2 b = 3 c = 30	a = 60 b = Light c = 0	14 / 14	0	0	5	1	1
	2	05/05/2021 Torching, Bottle Trapping, Egg Search, Sweep Netting	a = 2 b = 3 c = 30	a = 60 b = Light c = Moderate, short showers	8 / 8	0	0	10	0	1
	3	10/05/2021 Torching, Bottle Trapping, Egg Search	a = 2 b = 3 c = 30	a = 15 b = Light c = 0	12 / 12	0	5	3	1	2
	4	17/05/2021 Torching, Bottle Trapping, Egg Search	a = 2 b = 3 c = 30	a = 75 b = Light c = 0	11 / 11	0	8	3	0	0
54	1	27/04/2021 Bottle Trapping, Torching, Egg Search	a = 1 b = 1 c = 0	a = 45 b = Light c = 0	11 / 11	15	27	6	0	0
	2	05/05/2021 Torching, Egg Search, Sweep Netting	a = 2 b = 1 c = 0	a = 25 b = Light c = 0	7 / 7	23	18	2	0	0
	3	11/05/2021 Torching, Bottle Trapping, Egg Search (GCN eggs present)	a = 2 b = 1 c = 0	a = 60 b = None c = 0	7 / 7	15	18	1	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	4	18/05/2021 Torching, Bottle Trapping, Sweep Netting	a = 2 b = 1 c = 0	a = 100 b = 0 c = 0	8 / 8	8	15	3	0	0
	5	24/05/2021 Torching, Bottle Trapping, Sweep Netting	a = 2 b = 2 c = 0	a = 10 b = 0 c = 0	8 / 8	11	14	6	0	0
	6	01/06/2021 Torching, Bottle Trapping, Sweep Netting	a = 2 b = 3 c = 0	a = 25 b = 0 c = 0	16 / 9	12	21	3	0	0
55A	1	27/04/2021 Survey abandoned	N/A	N/A	N/A	0	0	0	0	0
	2	05/05/2021 Torching, Sweep Netting, Egg Search	a = 0 b = 0 c = 0	a = 0 b = Light c = 0	2.6 / 2.6	0	0	0	0	0
	3	11/05/2021 Bottle Trapping, Sweep Netting, Egg Search	a = 0 b = 0 c = 50	a = 100 b = Light c = Light, short showers	10/10	0	0	4	0	0
	4	18/05/2021 Torching, Bottle Trapping, Egg Search	a = 1 b = 4 c = 95	a = 0 b = Light c = 0	8 / 8	0	0	0	0	0
67	1	19/04/2021 Torching, Bottle Trapping, Sweep Netting	a = 5 b = 2 c = 40	a = 95 b = Light c = 0	12 / 12	0	0	2	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions (a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	2	27/04/2021 Bottle Trapping, Refuge Search, Sweep Netting	a = 0 b = 0 c = 40	a = 85 b = 0 c = 0	11 / 11	0	0	0	0	0
	3	05/05/2021 Torching, Refuge Search, Sweep Netting	a = 5 b = 3 c = 30	a = 40 b = 0 c = 0	7 / 7	0	0	0	0	0
	4	12/05/2021 Torching, Bottle Trapping, Refuge Search, Sweep Netting	a = 5 b = 2 c = 40	a = 0 b = Light c = 0	7 / 7	0	0	0	0	0
84C	1	27/04/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 2 c = 0	a = 75 b = None c = 1	10 / 10	0	20	1	1	0
	2	04/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 2 c = 0	a = 5 b = Moderate c = 2	7 / 7	0	8	4	0	0
	3	10/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 2 c = 0	a = 0 b = None c = 3	12 / 12	0	13	0	0	1
	4	17/05/2021 Torching, Egg Search, Sweep Netting	a = 2 b = 2 c = 40	a = 0 b = Light c = 4	10 / 10	0	8	12	0	0
100	1	26/04/2021 Torching, Bottle Trapping, Egg Search	a = 1 b = 3 c = 10	a = 15 b = None c = 0	12 / 12	0	2	0	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	2	06/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 3 c = 15	a = 5 b = Light c = 0	7 / 7	0	1	1	0	0
	3	13/05/2021 Bottle Trapping, Sweep Netting, Torching, Egg Search	a = 1 b = 4 c = 15	a = 95 b = Light c = 0	10 / 10	0	0	0	0	1
	4	20/05/2021 Torching, Bottle Trapping, Egg Search	a = 1 b = 3 c = 15	a = 100 b = Light c = Light, short showers	9.9 / 9.9	0	0	0	0	0
104	1	27/04/2021 Torching, Bottle Trapping, Egg Search	a = 1 b = 3 c = 0	a = 15 b = Light c = 0	14 / 12	0	0	14	2	0
	2	06/05/2021 Torching, Egg Search, Sweep Netting	a = 1 b = 3 c = 0	a = 0 b = Light c = 0	3 / 3	0	0	1	0	0
	3	13/05/2021 Torching, Bottle Trapping, Egg Search	a = 0 b = 2 c = 0	a = 0 b = Light c = 0	10 / 10	0	9	0	0	0
	4	19/05/2021 Torching, Bottle Trapping, Egg Search	a = 1 b = 0 c = 0	a = 35 b = Light c = Light, short showers	9.9 / 9.9	0	0	21	1	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
110	1	29/04/2021 Torching, Egg Search, Sweep Netting	a = 0 b = 3 c = 0	a = 15 b = Light c = Light, short showers	10 / 7	0	0	0	0	0
	2	04/05/2021 Torching, Bottle Trapping, Egg Search	a = 0 b = 3 c = 50	a = 15 b = Light c = None	10 / 7	0	0	0		0
	3	12/05/2021 Torching, Egg Search, Bottle Trapping	a = 0 b = 3 c = 0	a = 25 b = Light c = Light, short showers	13 / 13	0	0	0	0	0
	4	19/05/2021 Torching, Egg Search, Bottle Trapping	a = 0 b = 2 c = 0	a = 65 b = Light c = Light, short showers	8 / 8	0	0	0	0	0
111	1	29/04/2021 Torching, Egg Search, Sweep Netting	a = 0 b = 3 c = 10	a = 60 b = Light c = Light, persistent showers	10 / 7	0	0	0	5	0
	2	04/05/2021 Torching, Bottle Trapping, Egg Search	a = 0 b = 2 c = 0	a = 50 b = Light c = Moderate, short showers	12 / 12	0	0	0	0	0
	3	12/05/2021 Torching, Egg Search, Bottle Trapping	a = 0 b = 2 c = 50	a = 25 b = Light c = 0	13 / 13	0	0	1	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	4	19/05/2021 Torching, Egg Search, Refuge Search, Bottle Trapping	a = 0 b = 3 c = 5	a = 15 b = Light c = 0	9 / 8	0	0	0	0	0
126	1	26/04/2021 Torching, Bottle Trapping, Refuge Search, Sweep Netting	a = 1 b = 1 c = 30	a = 0 b = Light c = 0	14 / 10	0	0	0	0	0
	2	04/05/2021 Torching, Bottle Trapping, Egg Search, Refuge Search	a = 1 b = 0 c = 25	a = 5 b = None c = 0	7 / 7	0	0	0	0	0
	3	10/05/2021 Torching, Bottle Trapping, Egg Search, Refuge Search	a = 2 b = 1 c = 30	a = 0 b = Strong c = 0	11.5 / 11.5	0	0	0	0	0
	4	17/05/2021 Torching, Bottle Trapping, Egg Search, Refuge Search	a = 1 b = 1 c = 30	a = 0 b = Light c = 0	11 / 11	0	0	0	0	0
127B	1	19/04/2021 Torching, Bottle Trapping, Refuge Search	a = 0 b = 2 c = 75	a = 0 b = Light c = 7	8.9 / 8.9	0	0	0	0	0
	2	26/04/2021 Torching, Bottle Trapping	a = 1 b = 2 c = 85	a = 0 b = Light c = 8	10 / 10	0	0	0	0	0



Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions (a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	3	04/05/2021 Torching, Bottle Trapping, Egg Search	a = 0 b = 0 c = 0	a = 0 b = Light c = 9	10 / 10	0	0	0	0	0
	4	10/05/2021 Torching, Bottle Trapping, Refuge Search	a = 1 b = 3 c = 0	a = 0 b = Light c = 10	11 / 11	0	0	0	0	0
	5	17/05/2021 Bottle Trapping, Torching, Refuge Search	a = 1 b = 2 c = 0	a = 0 b = Light c = 11	11 / 11	0	0	0	0	0
145	1	28/04/2021 Torching, Bottle Trapping, Egg Search	a = 0 b = 2 c = 10	a = 0 b = Light c = 0	13 / 13	0	0	0	0	0
	2	07/05/2021 Torching, Refuge Search, Sweep Netting, Egg Search	a = 0 b = 4 c = 20	a = 0 b = Light c = 0	8 / 8	0	0	0	1	0
	3	13/05/2021 Torching, Bottle Trapping, Sweep Netting	a = 0 b = 5 c = 30	a = 0 b = Light c = 0	10 / 10	0	0	0	0	0
	4	20/05/2021 Torching, Bottle Trapping, Egg Search, Refuge Search, Sweep Netting	a = 0 b = 4 c = 30	a = 0 b = Light c = 0	12 / 12	0	0	0	0	0
145B	1	28/04/2021 Torching, Egg Search,	a = 0 b = 4 c = 50	a = 0 b = Light c = 0	13 / 13	0	0	0	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions (a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
		Refuge Search, Sweep Netting								
	2	07/05/2021 Torching, Refuge Search, Sweep Netting	a = 1 b = 5 c = 20	a = 100 b = Moderate c = 0	8 / 8	0	0	0	0	0
	3	13/05/2021 Torching, Bottle Trapping, Sweep Netting	a = 0 b = 5 c = 50	a = 100 b = Light c = 0	10 / 10	0	0	0	0	0
	4	20/05/2021 Torching, Bottle Trapping, Refuge Search, Sweep Netting	a = 0 b = 5 c = 50	a = 100 b = Moderate c = 0	12 / 12	0	0	0	0	0
180	1	27/04/2021 Torching, Bottle Trapping, Egg Search	a = 5 b = 1 c = 40	a = 0 b = Light c = 1	11 / 11	0	0	0	0	0
	2	05/05/2021 Torching, Egg Search, Sweep Netting	a = 4 b = 2 c = 40	a = 0 b = Light c = 2	7 / 7	0	0	0	0	0
	3	11/05/2021 Bottle Trapping, Egg Search, Sweep Netting	a = 5 b = 2 c = 40	a = 0 b = Light c = 3	10 / 10	0	0	0	0	0
	4	19/05/2021 Torching, Bottle Trapping, Egg Search, Sweep Netting	a = 5 b = 3 c = 50	a = 0 b = Light c = 4	12 / 12	0	0	0	1	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions (a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	5	24/05/2021 Bottle Trapping, Egg Search, Sweep Netting	a = 5 b = 2 c = 40	a = 0 b = Light c = 5	9 / 9	0	1	0	1	0
	6	01/06/2021 Torching, Bottle Trapping, Egg Search, Sweep Netting	a = 5 b = 1 c = 40	a = 0 b = Light c = 6	16 / 9	0	0	0	0	0
187	1	27/04/2021 Torching, Bottle Trapping, Sweep Netting	a = 0 b = 2 c = 0	a = 0 b = Light c = 5	10 / 10	0	1	2	0	0
	2	05/05/2021 Torching, Refuge Search, Sweep Netting, Egg Search	a = 0 b = 2 c = 0	a = 0 b = Light c = 6	7 / 7	0	5	1	0	0
	3	12/05/2021 Torching, Bottle Trapping, Refuge Search	a = 0 b = 3 c = 5	a = 0 b = Light c = 7	7 / 7	0	5	1	1	0
	4	19/05/2021 Torching, Bottle Trapping, Refuge Search	a = 0 b = 4 c = 70	a = 0 b = Light c = 8	12 / 12	0	0	7	1	0
190	1	06/05/2021 Torching, Egg Search, Refuge Search, Sweep Netting	a = 4 b = 2 c = 0	a = 0 b = Light c = 9	7 / 7	0	0	0	0	0
	2	12/05/2021 Torching, Bottle Trapping, Egg Search, Sweep Netting	a = 4 b = 1 c = 0	a = 0 b = Light c = 10	7 / 7	0	6	9	0	0

Survey details			Survey conditions			Peak counts observed				
Waterbody ID	Visit no.	Survey date and methods performed	Waterbody conditions (a = macrophyte coverage, b = turbidity c = % pond margin inaccessible)	Weather conditions ( a = % cloud cover, b = wind, c = precipitation)	Start / End Temp (C)	GCN	SN	PN	CF	CT
	3	13/05/2021 Torching, Bottle Trapping, Egg Search	a = 4 b = 0 c = 0	a = 0 b = Light c = 11	10 / 10	0	2	2	6	0
	4	20/05/2021 Torching, Bottle Trapping, Egg Search, Sweep Netting	a = 4 b = 1 c = 0	a = 0 b = Light c = 12	12 / 12	0	0	10	2	0
	5	24/05/2021 Torching, Bottle Trapping, Egg Search	a = 3 b = 2 c = 0	a = 0 b = Light c = 13	9 / 9	0	0	5	0	0
	6	01/06/2021 Bottle Trapping, Egg Search, Sweep Netting	a = 0 b = 4 c = 0	a = 0 b = Light c = 14	14 / 13	0	2	0	0	0

Note: GCN = great crested newt, SN = smooth newt, PN = palmate newt, CF = common frog, CT = common toad

## Appendix I Waterbody GCN results summary table

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
<b>Ponds</b>						
22	Not suitable for HSI	Out	-	-	-	
27	0.60	In	Negative	Out	-	
28	0.41	Out	-	-	-	
29	0.58	In	Negative	Out	-	
30A	0.68	In	Negative	Out	-	
30B	0.70	In	Not suitable for eDNA	In	Likely absence	eDNA not completed due to access
31	0.48	Out	-	-	-	
31A	0.63	In	Negative	Out	-	
32	Not suitable for HSI	Out	-	-	-	
33	Not suitable for HSI	Out	-	-	-	
34	0.62	In	Negative	Out	-	
35	Not suitable for HSI	Out	-	-	-	
36A	0.57	In	Positive	In	Pop. class survey not possible	Access to pond was delayed therefore pop. class surveys could not be completed
36B	0.67	In	Positive	In	Pop. class survey not possible	Access to pond was delayed therefore pop. class surveys could not be completed
37	0.58	In	Negative	Out	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
38	0.64	In	Negative	Out	-	
40	0.45	In	-	-	Likely absence	Further surveys completed as pond was within 250m of a previously known breeding pond
40A	0.63	In	Not suitable for eDNA	In	Likely absence	eDNA not completed due to access
44	Not suitable for HSI	Out	-	-	-	
47	0.68	In	Negative	Out	-	
51	0.38	Out	-	-	-	
52	0.37	Out	-	-	-	
53	0.41	Out	-	-	-	
54	0.49	Out	N/A	-	Positive	Further survey completed as pond was a previously known breeding pond
55	0.36	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
55A	0.60	In	Negative	In	Likely absence	Further surveys completed as pond within scheme boundary
56	0.55	In	Negative	Out	-	
56A	Not suitable for HSI	Out	-	-	-	
59	0.74	In	Inconclusive	In	Pop. class survey not possible	Access to pond was delayed therefore pop. class surveys could not be completed
59A	0.68	In	Positive	In	Pop. class survey not possible	Access to pond was delayed therefore pop. class surveys could not be completed
62	0.36	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
64B	0.61	In	Negative	Out	-	
65	0.60	In	Not suitable for eDNA	Out	-	Pond became completely dry and unsuitable for eDNA or pop class surveys
67	0.46	In	Not suitable for eDNA	In	Likely absence	Further surveys completed as pond has had previous GCN records
68	0.53	In	Negative	Out	-	
69	Not suitable for HSI	Out	-	-	-	
69A	0.67	In	Negative	Out	-	
69B	0.35	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
69C	0.34	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
69D	Not suitable for HSI	Out	-	-	-	
69E	Not suitable for HSI	Out	-	-	-	
69F	Not suitable for HSI	Out	-	-	-	
70	Not suitable for HSI	Out	-	-	-	
80	Not suitable for HSI	Out	-	-	-	
82	0.62	In	Negative	Out	-	
83	Not suitable for HSI	Out	-	-	-	
84	0.31	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
84A	Not suitable for HSI	Out	-	-	-	
84B	0.47	Out	-	-	-	
84C	0.42	Out	Inconclusive	In	Likely absence	Further survey completed as pond within 50m of scheme boundary
86B	0.60	In	Negative	Out	-	
86C	Not suitable for HSI	Out	-	-	-	
90	0.56	In	Negative	Out	-	
90A	0.50	In	Not suitable for eDNA	Out	-	Pond became completely dry and unsuitable for eDNA or pop class surveys
91	0.61	In	Negative	Out	-	
91A	0.61	In	Negative	Out	-	
92	Not suitable for HSI	Out	-	-	-	
93	Not suitable for HSI	Out	-	-	-	
94	Not suitable for HSI	Out	-	-	-	
95	0.43	Out	-	-	-	
96	0.43	Out	-	-	-	
99	0.47	Out	-	-	-	
100	0.71	In	Not suitable for eDNA	In	Likely absence	eDNA not completed due to access
101	0.48	Out	-	-	-	
102	0.51	In	Negative	Out	-	



Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
104	0.57	In	Inconclusive	In	Likely absence	
105	0.62	In	Negative	Out	-	
106	0.53	In	Negative	Out	-	
107	0.58	In	Negative	Out	-	
108	0.42	Out	-	-	-	
109	0.49	Out	-	-	-	
110	0.43	In	Negative	In	Likely absence	Further surveys completed as pond adjacent to suitable GCN pond
111	0.61	In	Negative	In	Likely absence	
112	0.61	In	Negative	Out	-	
112B	Not suitable for HSI	Out	-	-	-	
112C	Not suitable for HSI	Out	-	-	-	
115	0.59	In	Negative	Out	-	
115A	0.52	In	Negative	Out	-	
115B	0.48	In	Negative	Out	-	Further surveys completed as pond adjacent to previously confirmed GCN pond
116	0.69	In	Negative	Out	-	
117	0.74	In	Negative	Out	-	
119	0.61	In	Not suitable for eDNA	-	-	
119A	Not suitable for HSI	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
120	0.44	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
120A	0.59	In	Negative	Out	-	
121	Not suitable for HSI	Out	-	-	-	
122	0.39	Out	-	-	-	
123	0.42	Out	-	-	-	
126	0.73	In	Not suitable for eDNA	-	Likely absence	eDNA not completed due to access
126A	0.58	In	Negative	Out	-	
126B	0.58	In	Not suitable for eDNA	Out	-	Pond became completely dry and unsuitable for eDNA or pop class surveys
127	0.58	In	Negative	Out	-	
127A	0.70	In	Negative	-	-	
127B	0.58	In	Not suitable for eDNA	-	Likely absence	eDNA not completed due to access
128	0.68	In	Negative	Out	-	
129	Not suitable for HSI	Out	-	-	-	
131	Not suitable for HSI	-	Negative	Out	-	
131A	0.74	In	Negative	Out	-	
132	0.63	In	Negative	Out	-	
133	0.44	Out	-	-	-	
133A	Not suitable for HSI	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
133C	Not suitable for HSI	Out	-	-	-	
135	Not suitable for HSI	Out	-	-	-	
137	0.53	In	Negative	Out	-	
138	Not suitable for HSI	Out	-	-	-	
139	0.33	Out	-	-	-	
140	Not suitable for HSI	Out	-	-	-	
141	Not suitable for HSI	Out	-	-	-	
142	0.57	In	Negative	Out	-	
143	Not suitable for HSI	Out	-	-	-	
145	0.62	In	Inconclusive	In	Likely absence	
145B	0.59	In	Inconclusive	In	Likely absence	
145C	0.38	Out	-	-	-	
147	Not suitable for HSI	Out	-	-	-	
148	Not suitable for HSI	Out	-	-	-	
149	Not suitable for HSI	Out	-	-	-	
153	0.55	In	Inconclusive	In	Not suitable for pop. class survey	Pond became completely dry and unsuitable for pop class surveys

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
160	Not suitable for HSI	Out	-	-	-	
165	Not suitable for HSI	Out	-	-	-	
166	0.36	Out	-	-	-	
167	0.57	In	Negative	Out	-	
168	0.37	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
169	0.59	In	Negative	Out	-	
170	0.52	In	Negative	-	-	
171	0.53	In	Not suitable for eDNA	-	-	-
173	0.46	Out	-	-	-	
174	0.40	Out	-	-	-	
175	0.40	Out	-	-	-	
176	0.34	Out	-	-	-	
177	0.34	Out	-	-	-	
178	0.59	In	Negative	Out	-	
179	Not suitable for HSI	Out	-	-	-	
180	0.55	In	Positive	In	Likely absence	
181	0.49	In	Negative	-	-	Further surveys completed as pond was within 250m of previously known breeding pond
182	0.56	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Pond dried up before eDNA and pop. class surveys could be completed

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
183	0.47	Out	-	-	-	
185	0.22	Out	-	-	-	
186	0.56	In	Not suitable for eDNA	-	-	-
187	0.37	Out	Inconclusive	In	Likely absence	Further survey completed as pond within scheme boundary
188	0.36	In	Negative	-	-	Further survey completed as pond within 50m of scheme boundary
189	0.47	Out	-	-	-	
190	0.51	In	Positive	In	Likely absence	
191	0.56	In	Negative	Out	-	
192	Not suitable for HSI	-	Negative	Out	-	
193	0.64	In	Negative	Out	-	
<b>Ditches</b>						
D001	Not suitable for HSI	Out	-	-	-	
D004	0	In	Not suitable for eDNA	-	-	Ditch dried up before eDNA surveys could be completed
D038	-6	Out	-	-	-	
D039	-2	Out	-	-	-	
D040	-2	Out	-	-	-	
D041	Not suitable for HSI	Out	-	-	-	
D042	Not suitable for HSI	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
D043	Not suitable for HSI	Out	-	-	-	
D044	Not suitable for HSI	Out	-	-	-	
D045	Not suitable for HSI	Out	-	-	-	
D046	Not suitable for HSI	Out	-	-	-	
D047	Not suitable for HSI	Out	-	-	-	
D048	Not suitable for HSI	Out	-	-	-	
D049	Not suitable for HSI	Out	-	-	-	
D050	Not suitable for HSI	Out	-	-	-	
D051	Not suitable for HSI	Out	-	-	-	
D052	Not suitable for HSI	Out	-	-	-	
D053	Not suitable for HSI	Out	-	-	-	
D054	Not suitable for HSI	Out	-	-	-	
D055	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D056	-2	Out	-	-	-	

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
D058	3	In	Negative	Out	-	
D059	-4	Out	-	-	-	
D065	2	In	Negative	Out	-	
D065a	Not suitable for HSI	Out	-	-	-	
D067	Not suitable for HSI	Out	-	-	-	
D068	Not suitable for HSI	Out	-	-	-	
D069	Not suitable for HSI	Out	-	-	-	
D070	-4	Out	-	-	-	
D071	Not suitable for HSI	Out	-	-	-	
D072	5	In	Negative	Out	-	
D075A	-2	Out	-	-	-	
D075B	-4	Out	-	-	-	
D075C	Not suitable for HSI	Out	-	-	-	
D078	-2	Out	-	-	-	
D080	3	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D081	Not suitable for HSI	Out	-	-	-	
D082	0	In	Not suitable for eDNA	Out	-	Ditch became completely dry and unsuitable for eDNA or pop class surveys

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
D083	-4	Out	-	-	-	
D084	Not suitable for HSI	Out	-	-	-	
D085	Not suitable for HSI	Out	-	-	-	
D085a	Not suitable for HSI	Out	-	-	-	
D086	Not suitable for HSI	Out	-	-	-	
D087	Not suitable for HSI	Out	-	-	-	
D088	-2	Out	-	-	-	
D088A	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D089	Not suitable for HSI	Out	-	-	-	
D089	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D089A	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D093	Not suitable for HSI	Out	-	-	-	
D095	Not suitable for HSI	Out	-	-	-	
D099	Not suitable for HSI	Out	-	-	-	
D100	-2	Out	-	-	-	



Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
D101	Not suitable for HSI	Out	-	-	-	
D102	Not suitable for HSI	Out	-	-	-	
D103	Not suitable for HSI	Out	-	-	-	
D107	-2	Out	-	-	-	
D108	Not suitable for HSI	Out	-	-	-	
D109	Not suitable for HSI	Out	-	-	-	
D110	Not suitable for HSI	Out	-	-	-	
D111	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D112	Not suitable for HSI	Out	-	-	-	
D113	Not suitable for HSI	Out	-	-	-	
D115	-2	Out	-	-	-	
D117	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D118	3	In	Negative	Out	-	
D119	Not suitable for HSI	Out	-	-	-	
D120	0	In	Inconclusive	In	Not suitable for pop. class survey	Ditch became completely dry and unsuitable for pop class surveys

Waterbody ID	HSI score	Scoped in / out for further surveys	eDNA result	Scoped in / out for further surveys	Population size class survey result	Comments
D121	Not suitable for HSI	Out	-	-	-	
D123	-2	Out	-	-	-	
D124	-2	Out	-	-	-	
D125	Not suitable for HSI	Out	-	-	-	
D126	0	In	Negative	Out	-	
D127	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D128	0	In	Negative	Out	-	
D129	5	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D130	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D131	0	In	Not suitable for eDNA	-	Not suitable for pop. class survey	Ditch dried up before eDNA and pop. class surveys could be completed
D132	-2	Out	-	-	-	
D132	Not suitable for HSI	Out	-	-	-	
D133	-4	Out	-	-	-	
D134	2	In	Negative	Out	-	
D135	1	In	Negative	Out	-	
D136	-4	Out	-	-	-	

# Appendix J GCN Survey Results Plan



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**LEGEND**

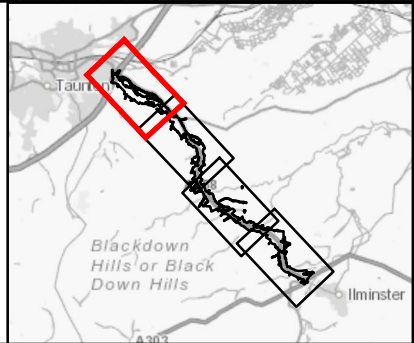
ECOLOGY SURVEY ZONE  
 250M (ONLINE SECTION)  
 500M (OFFLINE SECTION)

**SURVEY RESULTS**

- POSITIVE
- LIKELY ABSENCE FOLLOWING SURVEYS
- SCOPED OUT AT HSI STAGE
- NO LAND ACCESS
- GCN POSITIVE SURVEY RESULTS 500M BUFFER

**DITCH HSI SCORE**

- SUITABLE FOR GCN
- NOT SUITABLE FOR GCN
- NO LAND ACCESS



**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	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
 Drawing Status: SUITABLE FOR INFORMATION

**TAYLOR WOODROW**  
together @ VINCI

**ARUP** **RAMBOLL**

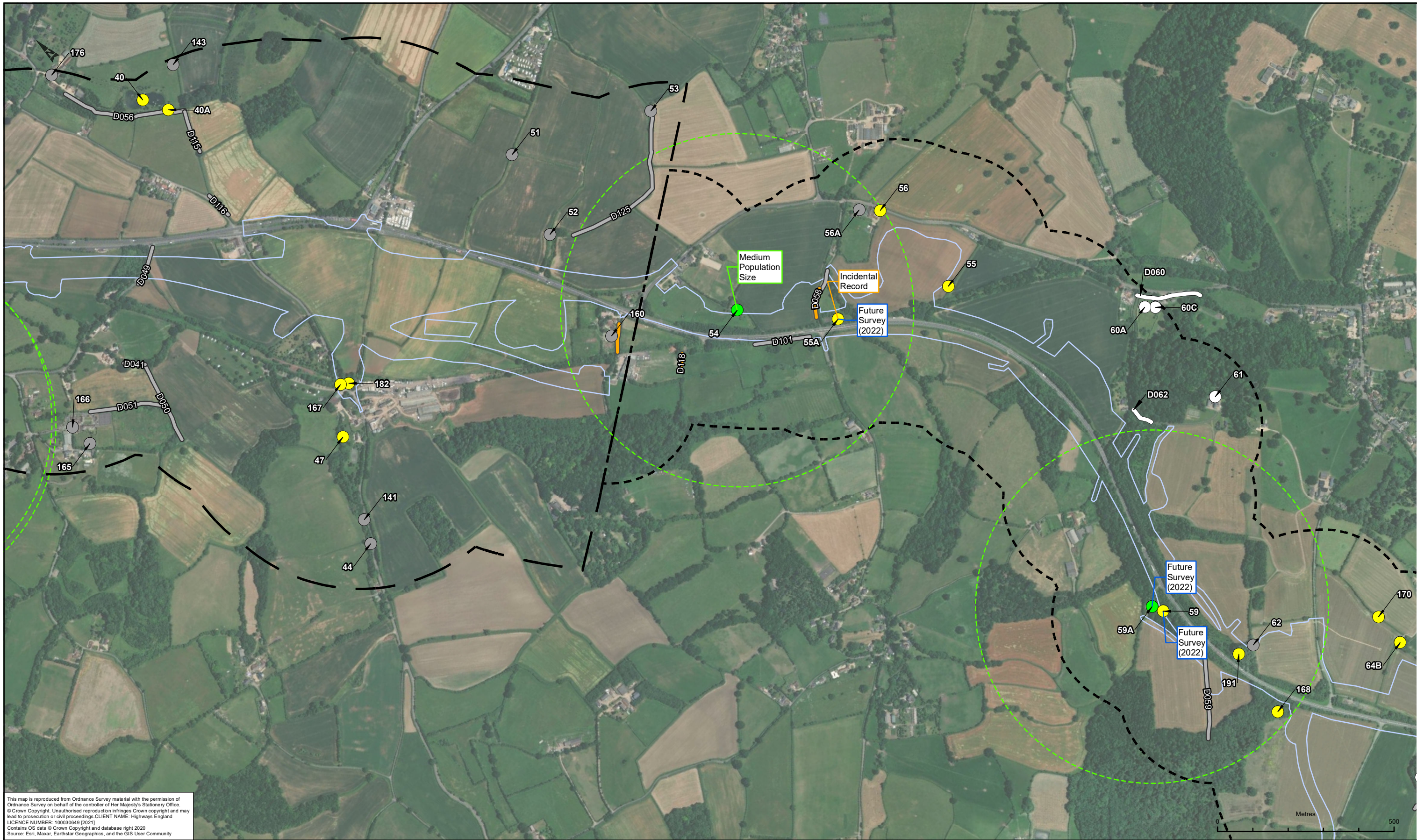
**national highways**

Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

Drawing Title: GREAT CRESTED NEWT SURVEY RESULTS SHEET 1 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22

Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P01
Location: ZZ	Type: -DR-LE-000304	Role: -	Number: -



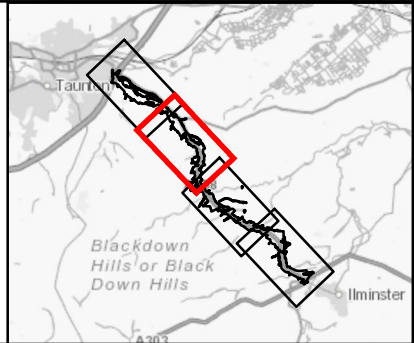
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**LEGEND**

**ECOLOGY SURVEY ZONE**  
 250M (ONLINE SECTION)  
 500M (OFFLINE SECTION)

**SURVEY RESULTS**  
 POSITIVE  
 LIKELY ABSENCE FOLLOWING SURVEYS  
 SCOPED OUT AT HSI STAGE  
 NO LAND ACCESS  
 GCN POSITIVE SURVEY RESULTS 500M BUFFER

**DITCH HSI SCORE**  
 SUITABLE FOR GCN  
 NOT SUITABLE FOR GCN  
 NO LAND ACCESS



**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	20/05/22	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: GREAT CRESTED NEWT SURVEY RESULTS SHEET 2 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P01	
Location: ZZ	Type: -DR	Role: -LE	Number: -000305	



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**LEGEND**

ECOLOGY SURVEY ZONE

ECOLOGY SURVEY ZONE BUFFER

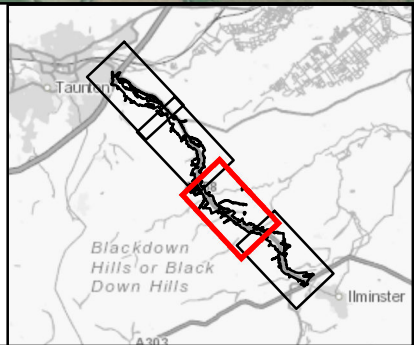
- 250M (ONLINE SECTION)
- 500M (OFFLINE SECTION)

**SURVEY RESULTS**

- POSITIVE
- LIKELY ABSENCE FOLLOWING SURVEYS
- SCOPED OUT AT HSI STAGE
- NO LAND ACCESS
- GCN POSITIVE SURVEY RESULTS 500M BUFFER

**DITCH HSI SCORE**

- SUITABLE FOR GCN
- NOT SUITABLE FOR GCN
- NO LAND ACCESS



**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	Aud'd
P01	20/05/22	ISSUE FOR INFORMATION	JE	MA	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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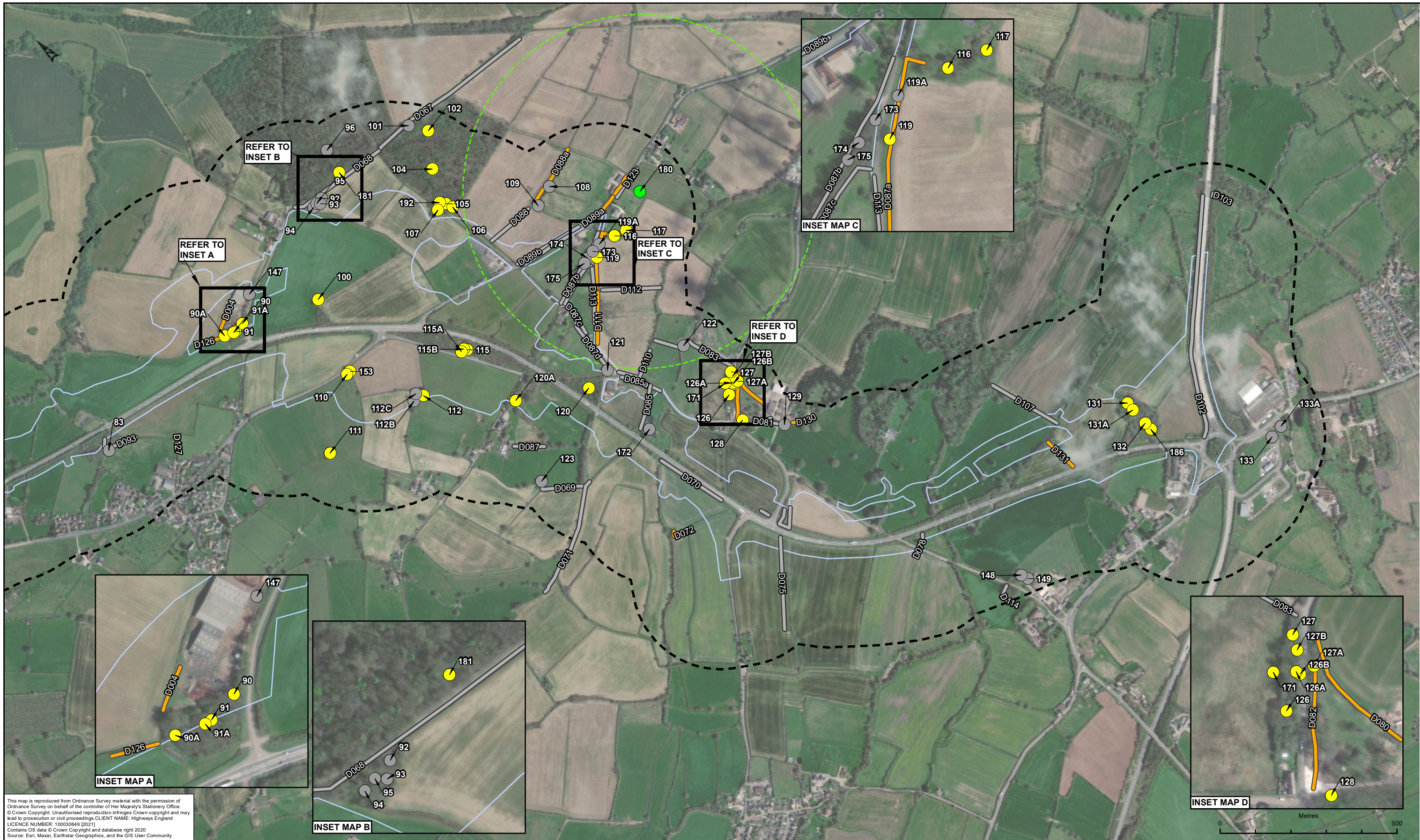
**ARUP** **RAMBOLL**

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Project Title: A358 TAUNTON TO SOUTHFIELDS DUALLING SCHEME

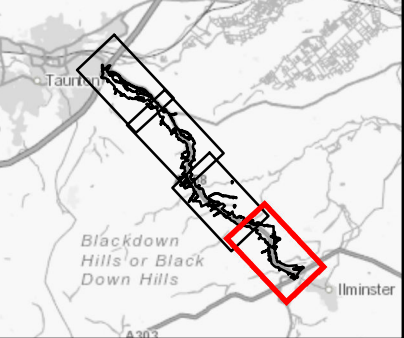
Drawing Title: GREAT CRESTED NEWT SURVEY RESULTS SHEET 3 OF 4

Scale: 1:10,000	By: JE	Checked: MA	Approved: JS	Authorised: SV
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Drawing Number: HE551508 - ZZ	Originator: ARP	Volume: VES	Revision: P01	
Location	Type	Role	Number	
			-DR - LE - 000306	



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LEGEND	
	ECOLOGY SURVEY ZONE
	DITCH HSI SCORE
	250M (ONLINE SECTION)
	500M (OFFLINE SECTION)
	POSITIVE
	LIKELY ABSENCE FOLLOWING SURVEYS
	SCOPED OUT AT HSI STAGE
	NO LAND ACCESS
	GCN POSITIVE SURVEY RESULTS 500M BUFFER
	SUITABLE FOR GCN
	NOT SUITABLE FOR GCN
	NO LAND ACCESS



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
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CONSTRUCTION	NONE
MAINTENANCE / CLEANING	NONE
USE	NONE
DECOMMISSIONING / DEMOLITION	NONE

Rev.	Date	Description	By	Chk'd	App'd	Auth'd
P01	20/05/22	ISSUE FOR INFORMATION	LL	GD	JS	SV

Suitability: S2  
Drawing Status: SUITABLE FOR INFORMATION

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**national highways**

Project Title		Drawing Title	
A358 TAUNTON TO SOUTHFIELDS		GREAT CRESTED NEWT SURVEY RESULTS SHEET 4 OF 4	
Scale: 1:10,000	By: JE	Checked: GD	Approved: JS
Original Size: A3	Date: 20/05/22	Date: 20/05/22	Date: 20/05/22
Author: SV	Originator: ARP	Volume: VES	Revision: P01
HE PIN: HE551508	ZZ	-DR - LE - 000307	
Location	Type	Role	Number

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