

Havant Thicket Reservoir Project

Environmental Statement Volume 4 – Appendices

Appendix 9 Biodiversity

Appendix A9.16: Pipeline Ecological Update

Portsmouth Water Ltd.

23/05/2024

Atkins Doc No.: HTR-ATK-XX-XX-RP-Z-0088

Atkins Revision No.: C01

Notice

This document and its contents have been prepared and are intended solely as information for Portsmouth Water Ltd. and use in relation to the Havant Thicket Reservoir.

AtkinsRéalis (formally known as Atkins, a member of SNC Lavalin) assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

No liability is accepted for any costs claims or losses arising from the use of this document, or any part thereof, for any purpose other than that which it has specifically been prepared or for use by any party other than Portsmouth Water Ltd.

The information which Atkins has provided has been prepared by an environmental specialist in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management. Atkins confirms that the opinions expressed are our true and professional opinions.

This document does not purport to provide legal advice.

This document has 89 pages including the cover.

CONFIDENTIAL REPORT

Due to the persecution faced by badgers, this report should be kept out of the public domain and is only intended for Portsmouth Water Ltd and Ward & Burke Construction Ltd.

Document History

PW Revision	Status	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	A1	Revised ES Submission	VG	LR	AR	JF	23/05/2024

Client Signoff

Client	Portsmouth Water Ltd.Portsmouth Water Ltd.
Project	Havant Thicket ReservoirProject
Job number	5169117
Client signature / date	

Contents

Chapter	Page
1. Introduction	5
Terms of Reference	5
The Pipeline Scheme	5
The Site	6
Scope of the Assessment	6
2. Methods	8
Desk Study	8
Protected and Priority Species	10
Badger Presence/Likely Absence Survey	11
Ground Level Tree Assessment and Aerial Tree Inspections	12
Preliminary Bat Roost Assessment and Hibernation Surveys	12
Otter Presence/Likely Absence Survey	12
Water Vole Presence/Likely Absence Survey	14
White-clawed Crayfish Presence/Likely Absence Survey	14
Surveyor Competencies	15
3. Results	17
Statutory and Non-statutory Designated Sites	17
National and Local Planning Policy	19
Protected and Priority Animal Species	26
4. Conclusion	50
Appendices	51
Appendix A. Non-statutory designated sites	52
Appendix B. Target Notes and Plant Species List	54
Appendix B. Legislation Table	78
Appendix C. National and Local Planning Policy	86

Tables

Table 1-1 – Surface work locations along the Pipeline Scheme (numbered from south to north)	6
Table 2-1 - Data search areas	9
Table 2-2 – Conventions used in classifying badger setts	11
Table 2-3 – Otter resting site status assessment criteria	13
Table 3-1 – Statutory designated sites for nature conservation within 2 km of the Site	17
Table 3-2 - Non-statutory designated sites for nature conservation within 2 km of the Site	18
Table 3-3 – Irreplaceable habitats within 500 m of the Site	19
Table 3-4 – Potential ancient, veteran and notable trees within 500 m of the Site	21
Table 3-5 – Habitat types within the Site (surface work locations only)	24
Table 3-6 - Badger field signs within the Site	26
Table 3-7 – Results of the GLTAs, aerial inspections and PBRAs for the Site (surface work locations only)	29
Table 3-8 – Habitat suitability for hazel dormice within the Site (surface work locations only)	37
Table 3-9 – Habitat suitability for widespread species of reptile within the Site (surface work locations only)	44
Table 3-10 – HSI assessment results summary	47

Table A-1 - SINC's within 2 km of the Site	52
Table B-2 - Summary of habitats within the Site	71
Table B-1 - Summary of legislation	78

1. Introduction

Terms of Reference

- 1.1. AtkinsRéalis (formerly Atkins Limited), was commissioned to undertake a preliminary ecological update (PEU) in connection with the installation of a pipeline between the Bedhampton Springs at the Bedhampton pumping station and the Havant Thicket Reservoir. The 'pipeline corridor' generally lies to the south of the reservoir site however, the northern section of it (referred to as 'Section 10') extends into the footprint of the reservoir itself.
- 1.2. The Pipeline Scheme is located near Havant, Portsmouth, as shown on Figure 9.6 in the Environmental Statement (ES) Volume 3 (hereafter referred to as the Site).
- 1.3. This report has been undertaken with reference to current good practice¹ and provides an initial appraisal of any likely ecological constraints upon designated sites, protected species and other features of ecological interest.
- 1.4. The information provided in this report underpins the updated Ecological Impact Assessment (EclA) carried out for the pipeline, as documented in the revised Havant Thicket Reservoir ES, July 2024 (Chapter 9: Biodiversity).
- 1.5. The Havant Thicket Reservoir hybrid planning application and outline planning application for the associated pipeline, between the reservoir and Bedhampton springs and pumping station, were approved on 15th October 2021.
- 1.6. A new pipeline route and design have been identified, which needs new planning approval. A new full planning application has been prepared for the revised pipeline route supported by the revision to the original ES (2020) and this PEU for the new pipeline route.

The Pipeline Scheme

- 1.7. The objective of the Havant Thicket Reservoir Scheme is to provide a new resource to supply drinking water in the water-stressed South East of England, while maximising the community and environmental benefits of a new raw water reservoir.
- 1.8. The reservoir, when constructed, will be filled with surplus water drawn from the Bedhampton Springs at the Bedhampton pumping station. This will be when flows are at their highest in winter via a new pipeline, and will provide water supplies to Portsmouth Water customers in the summer months as required. The Pipeline Scheme will also enable additional water to be supplied to Southern Water. Southern Water has a forecast deficit in water resources in the Hampshire area, created by the reduction in abstraction from the internationally designated River Itchen and the nationally designated River Test, as agreed with the Environment Agency.
- 1.9. As well as augmenting water supplies and increasing the resilience of water resource management in the South East, the reservoir would provide a new recreational resource adjacent to one of the more deprived areas in South East Hampshire, in a location which the community can access on foot, by bike, or through existing bus routes. It also offers further opportunities to improve the wider footpath, cycleway and bridleway networks in the area. More than 29,500 people live within reasonable walking distance of the Site (1.5 km) and 120,000 people live within reasonable cycling distance (4.5 km).
- 1.10. The Scheme would provide a new wetland habitat and associated area for nature conservation. The proximity of the reservoir to the internationally important Langstone and Chichester Harbour means that it may be used as a safe retreat for qualifying bird species when there is disturbance in the Harbour Special Protection Area (SPA) and Special Area of Conservation (SAC). The construction of the reservoir will result in substantial reductions in nutrients loads to the harbour.
- 1.11. The proposed pipeline would transfer water from Bedhampton Springs to fill the reservoir in the winter and draw water off for treatment and supply when needed in the summer. It would also be used for emergency drawdown should the reservoir levels need to be reduced in emergency conditions, in accordance with the Environment Agency (EA) safety guidance.

¹ CIEEM (2017). Guidelines for Preliminary Ecological Appraisal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

- 1.12. The Scheme is allocated in the adopted Havant Borough Council (HBC) and East Hampshire District Council (EHDC) Local Plans. Further information and details can be found in the Planning Statement, which accompanies the planning applications.
- 1.13. The details of the Scheme, as they are currently understood, are shown on Figure 9.6 Site location in ES Volume 3.

The Site

- 1.14. The Pipeline Scheme extends from the Bedhampton pumping station, northwards through the Leigh Park housing estate in Havant under roads and open spaces. It runs north/north-east adjacent to Hermitage Stream and Riders Lane Stream before heading north-west through Staunton Country Park. The pipeline then crosses into the footprint of the reservoir itself..
- 1.15. The Pipeline Scheme comprises seven underground-only work locations (the drilled sections) and ten surface work locations, collectively referred to as 'the Site' in this report. The surface works comprise of eight Shafts, and two Sections where the pipeline will be installed via open-cut methodology. The location of each surface work location is detailed in Table 1-1. The surface work location ID will be used to reference the specific surface works locations, where required, throughout the report.

Table 1-1 – Surface work locations along the Pipeline Scheme (numbered from south to north)

Surface work location ID	Central Ordnance Survey National Grid Reference (OSNGR)
Shaft 1 / Bedhampton site	SU 70557 06332
Shaft 2	SU 70700 06893
Shaft 3	SU 70863 07175
Shaft 4	SU 71123 07331
Emergency Discharge Chamber	SU 71009 07562
Shaft 5	SU 71183 07793
Shaft 6	SU 71291 08166
Shaft 7	SU 71611 08293
Shaft 8	SU 71832 08741
Section 9	SU 71717 08900
Section 10 (reservoir site)	SU 71123 09746

- 1.16. The habitats present throughout the Site (surface works locations only) comprise broadleaved mixed and yew woodland, including wet woodland and lowland mixed deciduous woodland, other neutral and modified grassland, dense scrub and tree lines intersected by rivers and streams (Hermitage or Riders Lane Stream). At the northern end of the Pipeline Scheme, the Site intersects Staunton Country Park, which includes various designations within its boundary and continues into the reservoir site, which formerly comprised other neutral grassland, purple moor grass and rush pasture and lowland mixed deciduous woodland, but has since been replaced with an active construction site for the main Havant Thicket Reservoir scheme.

Scope of the Assessment

- 1.17. This report presents ecological information obtained during the following:
1. A desk-study undertaken on 15/02/2023;
 2. A UK Habitat (UKHab) Classification walkover survey and a habitat suitability assessment for widespread species of reptile, hazel dormouse and great crested newt across accessible land and/or watercourses within and adjacent the Site undertaken between January and March 2023;

3. A badger walkover survey of accessible land within and adjacent to the Site undertaken in January and February 2023;
 4. Ground-level tree assessments (GLTAs) and aerial tree inspections across accessible land within and adjacent to the Site undertaken in February 2023; and
 5. An otter and water vole presence/ likely absence survey of accessible watercourses within and adjacent to the Site undertaken in March 2023.
- 1.18. A further change to the red line boundary of the Pipeline Scheme was made in November 2023 to reflect the need for a dual pipeline design. As the updated planning application is anticipated to be submitted in early 2024, it is likely that a biodiversity net gain (BNG) assessment will be required to support the application. The following updated surveys were undertaken to account for the design change and potential requirement for a BNG assessment:
6. A white-clawed crayfish (WCC) habitat suitability assessment, WCC presence/likely absence surveys, and an otter presence/likely absence survey, of Hermitage Stream within Shaft 1 undertaken on 25/10/2023;
 7. A UKHab classification survey and a protected species walkover survey within the Bedhampton site undertaken on 10/11/2023; and
 8. GLTAs, aerial tree inspections and preliminary bat roost assessments (PBRAs) within the Bedhampton site undertaken on 29/11/2023.
- 1.19. The walkover surveys and identification of potential ecological constraints were based on the condition of the Site and its immediate surrounds encountered at the time of each walkover survey, and the information about the Pipeline Scheme available at the time of producing this report. If information on the Pipeline Scheme should change, the Site may need to be re-visited to establish if there are any further ecological constraints arising from changes to the proposals.
- 1.20. No ecological surveys were carried out in Section 10 for the current assessment as it is an active construction site. Previously ecological information gathered for the reservoir site has been considered where necessary.

2. Methods

Desk Study

- 2.1. The geographical area for obtaining ecological data through desk studies has been determined using best practice guidance (as set out in internal AtkinsRéalis guidance) and professional judgement. Baseline data has been gathered from a range of sources through reviewing previous ecological information regarding the wider Havant Thicket Reservoir scheme, data requests, consultation, and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites for nature conservation and protected and priority habitats and species (as defined by Chartered Institute of Ecology and Environmental Management (CIEEM) preliminary ecological appraisal (PEA) guidance²), and an assessment of the likely importance of habitat features present for such species was also undertaken during the walkover surveys.
- 2.2. The study areas used for the data gathering are detailed in
- 2.3. Table 2-1. The desk study was undertaken on 15/02/2023, followed by an updated desk study undertaken on 05/12/2023. For species records collected, only those within 10 years of the data collection date have been considered within the assessment.
- 2.4. The following online resources were accessed:
 - Multi-Agency Geographic Information for the Countryside (MAGIC) website³; and
 - Woodland Trust Ancient Tree Inventory⁴.
- 2.5. Ordnance Survey maps and Grid Reference Finder⁵ were used to identify the presence of waterbodies within 250 m of the Site boundary, in order to establish if the land within and immediately surrounding the Site could be used as terrestrial habitat for great crested newts. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond⁶. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond⁷.
- 2.6. Hampshire Biodiversity Information Centre (HBIC)⁸ was contacted on 02/12/2022 to request records of protected and priority species and habitats and details of non-statutory designated sites for nature conservation. HBIC was also contacted on 12/09/2023 to request updated records of non-statutory designated sites for nature conservation.
- 2.7. With the exception of the additional working area north of Staunton Country Park referred to as Section 10, the updates made to the Pipeline Scheme's red line boundary in November 2023 were minor in nature and, therefore, did not warrant an additional request to HBIC for protected and priority species. The baseline of the Section 10, within the main Havant Thicket Reservoir site, was previously assessed as a part of the hybrid planning application, which was approved in October 2021. As a part of the previous baseline assessment, a request of records of protected and priority species was made. As such, protected and priority species records were previously captured and, therefore, also did not warrant an additional request to HBIC.
- 2.8. Botanical monitoring reports were also requested from HBIC for High Lawn⁹ and Thicket Lawn¹⁰, both of which are non-statutory designated sites situated in Staunton Country Park.

² As set out in Box 1 on page 4 of the CIEEM (2019) Guidelines for Preliminary Ecological Appraisal, priority species include those listed as a national and/or local priority for conservation (i.e. a Habitat of Principle Importance or Species of Principle Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006; in Wales under Section 7 of the Environment (Wales) Act 2016; in Scotland under Section 2(4) of the Nature Conservation (Scotland) Act 2004; in Northern Ireland under Section 3(1) of the Wildlife and Natural Environment Act (Northern Ireland) 2011), International Union for the Conservation of Nature (IUCN) Red List or Amber List, Nationally Rare or Nationally Scarce, or endemic to a country or geographic location.

³ Multi-Agency Geographic Information for the Countryside (MAGIC) [Online]. Available at: <https://magic.defra.gov.uk/> [Accessed: 15/02/2023].

⁴ Woodland Trust Ancient Tree Inventory [Online]. Available at: <https://ati.woodlandtrust.org.uk/> [Accessed: 15/02/2023].

⁵ UK Grid Reference Finder [Online]. Available at: <https://gridreferencefinder.com/> [Accessed: 15/02/2023].

⁶ English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

⁷ English Nature (2004). An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576) [Online]. Available at: <http://publications.naturalengland.org.uk/publication/134002> [Accessed: 15/02/2023].

⁸ Contacted on 10/01/2023.

⁹ Hampshire Biodiversity Information Centre (2020). Survey Summary: High Lawn

¹⁰ Hampshire Biodiversity Information Centre (2020). Survey Summary: Thicket Lawn

Table 2-1 - Data search areas

Data type	Search area – distance from Pipeline Scheme boundary
Statutory designated sites for nature conservation	2 km
Non-statutory designated sites for nature conservation	2 km
Irreplaceable habitats ¹¹	500 m
Ancient, veteran and notable trees	500 m
Priority habitats and species excluding bats	1 km
Bats	2 km
Waterbodies	250 m

A review of national and local planning policy relevant to the Pipeline Scheme was undertaken as part of the data gathering. The following policy documents were subject to review:

- National Planning Policy Framework (2021)¹²;
- Havant Borough Core Strategy (2011); and
- Havant Borough Site Allocations (2014).

Field Surveys

- 2.9. The geographical area for undertaking ecological field surveys has been determined using the current survey guidance, professional judgement and the zones of influence, which have been determined based on likely effects arising from the Pipeline Scheme.
- 2.10. Following CIEEM's Guidelines for PEA, a walkover survey was undertaken focusing on protected and priority habitats and/or species.
- 2.11. Surveys were carried out for the nine surface work locations and the emergency drawdown chamber only. The seven underground-only work locations and the tenth surface work location (Section 10) were not surveyed.
- 2.12. The walkover survey was undertaken between January and March 2023. This included all land within the Site (nine surface work locations only) plus a buffer of up to 30 m from the Site boundary where access was allowed (the Site). An updated walkover survey was undertaken in November 2023 and included additional land plus a buffer of up to 30 m added to the new red line boundary within the Bedhampton site.

Habitats

- 2.13. Habitats were mapped during the walkover surveys using the UKHab classification system. UKHab is a comprehensive and hierarchical habitat classification system for the UK that has been developed to benefit from recent changes in habitat categorisation, recording and analysis, and is suitable for digitally recording in the field using GIS. It is fully compatible with other major existing classifications, including Priority Habitat types (UKHab Level 4) and Habitats Directive Annex I habitat types¹³ (UKHab Level 5).
- 2.14. All habitats were recorded to at least Level 3 of the UKHab hierarchy (referred to as a Primary Habitat Code), i.e. broad habitats such as neutral grassland or dense scrub. Any Level 4 habitats and Level 5 habitats present have also been recorded. In addition, mandatory secondary codes have been recorded (up to secondary code number 49, which denote contextual information regarding habitat type including but not limited to type of land use or additional habitat features).

¹¹ As defined in the National Planning Policy Framework (2021): Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.

¹² Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework. Available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/91721/nppf-2021.pdf) [Accessed 15/02/2023].

¹³ Council Directive 92/43/EEC (1992) on the conservation of natural habitats and of wild fauna and flora (known as the 'Habitats Directive').

These codes denote contextual information regarding the habitat type, for example type of land use or additional features such as scattered scrub. All habitat features have been digitally mapped, using ArcGIS, as either polygons, lines or points and assigned to a UKHab Primary Habitat Code.

- 2.15. An assessment of the possible presence of priority habitats (as defined by CIEEM PEA guidance) was also undertaken during the walkover survey.
- 2.16. Vascular plant names recorded during this survey follow Stace¹⁴.
- 2.17. Target notes (TNs) were used to record specific details on the plant species composition of the habitats, current management and quality. TNs were also used to record features of ecological importance (e.g. ponds, complex habitat mosaics).

Protected and Priority Species

- 2.18. An assessment of the possible presence of protected or priority species (as defined by CIEEM PEA guidance), and an assessment of the likely importance of habitat features present that could support such species was also undertaken during the walkover survey.
- 2.19. Surveyors used current guidance and methodologies, as referenced by CIEEM, for preliminary assessment of species.
- 2.20. The survey comprised assessing the suitability of the habitats present for, and recording any activity of the following species (in line with current guidance):
 - Badgers¹⁵;
 - Bats¹⁶;
 - Hazel dormice¹⁷;
 - Otters^{18,19};
 - Water voles²⁰;
 - Breeding, wintering and passage birds²¹;
 - Widespread species of reptiles²²;
 - Amphibians (terrestrial and aquatic habitats), including an assessment of aquatic habitat for suitability to support great crested newts using the Habitat Suitability Index (HSI) assessment²³
 - White-clawed crayfish²⁴;
 - Priority invertebrates²⁵; and
 - Priority plants.
- 2.21. Evidence of the presence of the following invasive species was recorded during the walkover survey, where seen:
 - Evidence of animal species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019; Chinese mitten crabs, red swamp crayfish, signal crayfish, spiny-cheek crayfish, muntjac deer, ruddy ducks, Egyptian geese and grey squirrels; and

¹⁴ Stace (2019). New Flora of the British Isles 4th edition.

¹⁵ Harris S., Cresswell P. and Jefferies D. (1989). Surveying badgers. Mammal Society – No9.

¹⁶ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London.

¹⁷ English Nature (2006). The Dormouse Conservation Handbook (2nd edition).

¹⁸ Chanin and Smith (2003). Monitoring the otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.

¹⁹ Liles G. (2003). Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough.

²⁰ Dean, M. et al (2016). The Water Vole Mitigation Handbook. Mammal Society.

²¹ Bird Survey & Assessment Steering Group (2022). Bird Survey Guidelines for assessing ecological impacts, v.0.1.7. Available at: <https://birdsurguidelines.org> [Accessed: 15/02/2023].

²² Froglife (1999). Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife advice sheet 10.

²³ Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155 (2000).

²⁴ Peay S. (2003). Monitoring the White-clawed Crayfish *Austropotamobius pallipes*. Conserving Nature 2000 Rivers Monitoring Series No. 1. English Nature, Peterborough.

²⁵ At the present time there is no current survey guidance for priority invertebrates.

- Evidence of the presence of the following invasive plant species: Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron²⁶, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, cotoneaster²⁷, yellow azalea, few-flowered leak, montbretia, giant rhubarb, Japanese rose, three-cornered garlic, fanwort, floating pennywort, curly waterweed, water hyacinth, floating water primrose, parrot's feather and waterweeds (all species of the genus *Elodea*). These are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control.

Badger Presence/Likely Absence Survey

- 2.22. A badger survey was carried out by suitably experienced ecologists in accordance with good practice guidance²⁸ and CIEEM competencies for undertaking badger surveys²⁹.
- 2.23. The extent of the badger survey was based on the zone of influence for this species and included all land within the Site and a 30 m buffer extending out in all directions from the Site where access allowed (the Badger Survey Area).
- 2.24. The Badger Survey Area was inspected for evidence of badger activity including setts, latrines, dung pits, prints, snuffle holes (created when foraging), pathways, hairs (e.g. caught on fencing) and scratching posts.
- 2.25. Where setts were located, they were classified following the criteria²⁸ given in Table 2-2 below. The assessment of the likely status of the badger sett(s) was made based on the available evidence and the surveyor's experience.

Table 2-2 – Conventions used in classifying badger setts

Likely status	Typical features
Main	Usually several holes but can equally be a one hole with large spoil heaps and obvious paths emanating from and between sett entrances. Used all year round.
Annex	Normally less than 150 m from main sett, and directly connected by well-worn pathways. May not be in use all the time, even if the main sett is very active.
Subsidiary	Usually at least 50 m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

- 2.26. The following criteria²⁸ were used to understand activity levels of each individual hole and present ideas of changing patterns of sett usage, which helped to determine the overall classification of each sett described above:
- Well used holes: there are obvious signs of current use³⁰ such as fresh spoil, footprints, bedding and/or hairs. No obstructions in the entrance and holes may or may not have been recently excavated;
 - Partially used holes: entrances may have debris including fallen leaves, stones or earth and sticks, and even cobwebs across the entrance. Vegetation, including mosses may be growing in the entrance or on old spoil just outside; and
 - Disused holes: entrances won't have been in use for some time, are partially or completely blocked or collapsed and in some cases there may only be a depression visible in the ground where the hole used to be. Vegetation including mosses may be covering the remains of the entrance or spoil heap.

²⁶ Although there are approximately 1200 species of rhododendron, just one species and one of its hybrids are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Rhododendron ponticum* and *Rhododendron ponticum* x *Rhododendron maximum*.

²⁷ There are approximately 100 species of cotoneaster found in the UK, but only five are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Cotoneaster horizontalis*, *Cotoneaster integrifolius*, *Cotoneaster simonsii*, *Cotoneaster bullatus* and *Cotoneaster microphyllus*.

²⁸ Harris, S., Cresswell, P. & Jefferies, D. (1989). Surveying Badgers. Occasional Publication No.9. The Mammal Society.

²⁹ CIEEM (2013). Competencies for Species Survey: Badger. The Chartered Institute of Ecology and Environmental Management, Winchester.

³⁰ Natural England (2009). Protection of Badgers Act 1992 (as amended) Guidance on 'Current Use' in the definition of a Badger Sett.

Ground Level Tree Assessment and Aerial Tree Inspections

- 2.27. A ground level tree assessment (GLTA) and aerial inspections were carried out by suitably experienced and licensed ecologists in accordance with good practice guidance³¹ and CIEEM competencies for undertaking bat surveys³².
- 2.28. The extent of the assessment was based on the zone of influence for this species group and included all trees within the Site (surface work locations only) and a 10 m buffer extending out in all directions from the Site boundary where access allowed (the Bat Survey Area).
- 2.29. The assessment involved a detailed visual examination of trees, which was initially undertaken from ground level, during daylight hours and aided with the use of binoculars and a bright torch.
- 2.30. The GLTAs involved the identification of potential roosting features (PRFs) such as woodpecker holes, rot holes, cracked limbs, dense ivy and flaking bark. Where PRFs were noted and where safe to do so, these were subject to aerial inspections, with the use of tree-climbing apparatus or a ladder, to search for evidence of bats or further indication of the potential suitability of each PRF to support bats.
- 2.31. Based on the location, aspect, orientation and characteristics of the features identified, each tree was assigned a potential suitability value for bats. The assessment of potential suitability was carried out according to good practice guidance³³, which assigns each structure/tree either Negligible, Low, Moderate or High suitability for roosting bats.

Preliminary Bat Roost Assessment and Hibernation Surveys

- 2.32. A preliminary roost assessment (PBRA) was carried out on two pumping station buildings at Bedhampton (referred to as Bedhampton 1 and Bedhampton 2). The PBRA was carried out by a suitably experienced ecologist on 29th November 2023 and 30th January 2024³⁴ in accordance with good practice guidance and Chartered Institute of Ecology and Environmental Management (CIEEM) competencies for undertaking bat surveys³⁵. The ecologist was a competent and licensed surveyor assessed following the CIEEM competency framework³⁶. The PBRA involved a detailed external visual examination of the buildings focusing on the identification of potential entry/exit points for bats or other PRFs such as holes in brickwork, cracks, and gaps in masonry, etc. The inspection was undertaken during daylight hours and aided with the use of a bright torch and an endoscope where possible. Based on the location, aspect, orientation, and characteristics of the features identified, the buildings were assigned a potential suitability value for bats.
- 2.33. Hibernation surveys were carried out on 30th January 2024 and 28th February 2024 at Bedhampton 1 and 2. The surveys included a detailed inspection of Bedhampton 1 and Bedhampton 2 during the winter to look for and identify hibernating bats or other evidence of bat occupation. To supplement the results of the detailed inspections, two Song Meter 4 (SM4) automated static bat detectors were positioned within Bedhampton 1 to detect activity from bats which may periodically arouse to drink or feed if it is warm enough for insects to be active (despite being in torpor throughout the hibernation season). Despite being in torpor throughout the hibernation season, bats periodically arouse to drink or feed if it is warm enough for insects to be active. The SM2s were left in place and recording between the surveys (a total of 29 days).

Otter Presence/Likely Absence Survey

- 2.34. An otter presence/likely absence survey was carried out by suitably experienced ecologists in accordance with good practice methodologies and were based on guidance set out in the Design Manual for Roads and Bridges (DMRB) Volume 10³⁷ and CIEEM competencies for undertaking otter surveys³⁸.

³¹ Surveys in 2023 followed the published survey guidelines at that time namely: Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

³² CIEEM (2013) Competencies for Species Survey: Bats. Chartered Institute of Ecology and Environmental Management, Winchester.

³⁴ A repeat PRA survey was carried out as internal access was restricted during the first PRA. Surveys in 2024 followed the updated survey guidelines namely: Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London

³⁶ CIEEM's Competency Framework. Available at: <https://www.cieem.net/competency-framework> [Accessed 24/03/2023].

³⁷ The Design Manual for Roads and Bridges DMRB Volume 10, Section 1 Part 9 HA 81/99 Chapter 7, Grogan

³⁸ CIEEM (April, 2013). Competencies for Species Survey: Eurasian Otter.

- 2.35. The extent of the survey was based on the zone of influence for this species and included suitable watercourses and waterbodies within 10 m of the Site (surface work locations only), extending along watercourses up to 250 m upstream and downstream of the Site, where access allowed (the Otter Survey Area).
- 2.36. Ecologists searched for evidence of otter and recorded the location and detail of all signs and resting sites. Resting sites are referred to using the following terms:
- Holt: a cavity or hole in a riverbank, in the ground, under tree roots, within rocks, or caves, where the back cannot be readily seen. If active this will usually contain field evidence such as spraints;
 - Hover: a bolt hole or ledge that will afford an otter temporary cover or a place to feed on captured prey. The back of a hover can usually be seen. If active there may be field evidence present, such as footprints, spraints, or feeding remains;
 - Couch: above ground location where an otter can lie up or groom. These may take the form of a simple swirl or depression in tall grasses where the otter has laid, or may be covered in a vegetated grass or reed 'roof';
 - Nursery area; and
 - Natal holt.
- 2.37. The assessment of resting site status has been determined by the quality of the feature and whether they provide key requirements for otters³⁹ (see Table 2-3). This can include cover and seclusion for an individual to sleep or rest, the provision of nursery or breeding habitat (including potential for a natal holt), the supply of critical factors such as feeding resources (ponds, lakes and water features), freshwater for cleaning and drinking, and the provision of suitable seclusion away from disturbance. This assessment is subjective and corroborated by the abundance of field evidence located in, or around, the feature. Diagnostic evidence such as spraints (including number and age class), urination 'green' spots, spraint mounds, paw prints, paths and slides (and their degree of use) has been interpreted to determine the status of the feature.

Table 2-3 – Otter resting site status assessment criteria

Resting site status	Definition
Low	A structure or feature with limited evidence of otter activity, indicated by low number of spraints present and all age classes may not be present (i.e. one fresh spraint, or a few old spraints). The structure will not be suitable as a breeding/natal site and is unlikely to afford sufficient seclusion to be an important resting site. It is unlikely to have important links to the key otter requirements (food and freshwater). This type of site is more likely to provide a temporary "stop off" for otters when moving throughout their territory. Loss/disturbance of such a feature is unlikely to be significant in terms of the individual or population.
Moderate	A structure or habitat feature containing spraints with a range of age classes, but not in quantities. Paths may be present leading to the feature but are not likely to be overly pronounced. The cover afforded by the structure may be limited or the site may only be suitable at certain times of year. Alternatively, it may not be available at periods of high tide/flow. The structure is unlikely to be suitable as a breeding/natal site but will afford suitable seclusion as a resting site and may be linked to other important features within the territory (feeding/grooming breeding areas). The impact arising from loss or disturbance of such a feature will be determined by the availability of more suitable or well used sites within the otter's territory. The absence of other suitable resting sites within a survey reach may elevate the status of the resting site.
High	The structure or habitat feature has a high level of otter activity, indicated by an abundance of sprainting of all age classes and may include large spraint mounds or well used grooming hollows. On occasion the spraints are all old but

³⁹ Bassett, S. and Wynn, J. (2010). Otters in Scotland: How vulnerable are they to disturbance? In Practise, 70: 19-22.

Resting site status	Definition
	of such abundance to indicate a high status feature but that it hasn't been used recently. The site may have a strong otter odour. Paths or slides leading to or from the feature will often be well worn and pronounced. High status resting sites often provide a high degree of cover and are usually coupled with key features such as fresh water and abundance of prey. The area may be suitable as a breeding area, for example with quality nursery habitat supplying pools for swimming and hunting practice and may afford safe features for provision of a natal holt. A natal holt may not have pronounced sprainting but is likely to be located in a highly secluded area with suitable habitat features. The site is usually available at all times of year and at high and low tide/flow. However, in certain situations elaborate couch features may only be used during the summer months, but occupied year after year which also indicates high status.

- 2.38. The following evidence of otter activity was searched for and recorded during the surveys:
- Spraints (droppings);
 - Feeding remains;
 - Paths and slides (defined otter paths on watercourse banks and mud slides evident of where the animal regularly enters the watercourse); and
 - Footprints.

Water Vole Presence/Likely Absence Survey

- 2.39. A water vole presence/likely absence survey was carried out by suitably experienced ecologists in accordance good practice guidance^{40,41}, and CIEEM competencies for undertaking water vole surveys⁴².
- 2.40. The extent of the survey was based on the zone of influence for this species and included suitable watercourses and waterbodies within 10 m of the Site (surface work locations only), extending along watercourses up to 250 m upstream and downstream of the Site, where access allowed (the Water Vole Survey Area).
- 2.41. The following evidence of water vole activity was searched for and recorded during the surveys:
- Burrows and 'lawns' (area around burrow entrances where there is grazed vegetation, surrounded by taller vegetation);
 - Faeces;
 - Latrines;
 - Feeding stations;
 - Runways and footprints;
 - Nests; and
 - Sightings.

White-clawed Crayfish Presence/Likely Absence Survey

- 2.42. A white-clawed crayfish (WCC) survey was completed on 24th November 2023 by a suitably experienced ecologist. The survey comprised an initial habitat suitability assessment and presence/likely absence surveys, comprising a manual search survey and an environmental DNA (eDNA) survey. The habitat suitability assessment and presence/likely absence surveys were

⁴⁰ Strachan, R. and Moorhouse, T. (2011). Water Vole Conservation Handbook (3rd edition). Wildlife Conservation Research Unit, University of Oxford.

⁴¹ Dean, M. et al (2016). The Water Vole Mitigation Handbook. Mammal Society.

⁴² CIEEM (April, 2013). Competencies for Species Survey: Water Vole.

undertaken broadly following good practice guidance^{43,44} and CIEEM competencies for undertaking WCC surveys⁴⁵.

- 2.43. The WCC presence/likely absence surveys involved the completion of a manual search survey, which involved searching under refuges identified in shallow, low turbidity water for crayfish and/or crayfish remains. Due to the low water level and due to habitat suitability being limited to a small stretch of Riders Lane Stream, a 369 m² area of the watercourse was defined as the survey area/ was subject to surveys (the WCC Survey Area).
- 2.44. To further support the manual search survey, an environmental DNA (eDNA) survey was also undertaken. The survey involved the collection of water samples to send for laboratory analysis to test for the presence/likely absence of three targets: white-clawed crayfish, signal crayfish, and crayfish plague. Signal crayfish are known to out-compete and predate WCC and are also known to carry *Aphanomyces astaci* fungus, commonly known as crayfish plague, which is fatal to WCC. As such, the presence of signal crayfish and/or crayfish plague contributes towards the presence/likely absence of WCC and should be considered as a part of a WCC presence/likely absence survey.
- 2.45. The WCC habitat suitability assessment and presence/likely absence surveys were undertaken in dry weather with normal to low flow river conditions.

Surveyor Competencies

- 2.46. All the surveys were led by surveyors who have been assessed to be at least of capable experience following the CIEEM competency framework⁴⁶, with the UKHab classification surveys led by surveyors with a minimum of Field Identification Skills Certificate (FISC) level 4⁴⁷.

Limitations

- 2.47. This section identifies any limitations to the surveys or assessment and provides an explanation as to the effect of these on the appraisal.
- 2.48. The optimal time for undertaking botanical surveys is typically during the core growing season (May to August inclusive), although this survey season may be extended in some instances dependent upon habitat type and surveyor competency. Surveys undertaken outside of this period are limited in their ability to produce a comprehensive list of species present at any given site. During the walkover habitats were classified based on the species present at the time of the survey and, therefore, classifications may differ during the core growing season. In general habitats present within the pipeline corridor were common and could be comfortably assigned to a habitat type, despite the timings of the survey. For habitats present within the working area of Staunton Country Park further botanical surveys were undertaken⁴⁸ to inform mitigation and historical botanical data (provided by HBIC) was reviewed.
- 2.49. Ecological surveys are limited by factors which affect the presence of animals such as the time of year, migration patterns and behaviour. The ecological surveys undertaken to support this PEA were completed in autumn and winter and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. Evidence of species activity, including feeding remains and droppings, will not be available for many species including bats and hazel dormice, as winter is the time that they are hibernating. A precautionary approach to assessment and mitigation on such species has been taken and further species-specific surveys have been specified where they are required for mitigation purposes.
- 2.50. Access was not possible to an area of Portsmouth Water-owned grassland and ground mounted photo-voltaic panels within Bedhampton Pumping Station site adjacent to Shaft 1 (the area was fenced off with no access but there was a sufficient view through the fencing to categorise the

⁴³ Peay S. (2003). Monitoring the White-clawed Crayfish *Austropotamobius pallipes* Conserving Nature 2000 Rivers Monitoring Series No. 1. English Nature, Peterborough.

⁴⁴ Peay, S (2000). Guidance on works affecting white-clawed crayfish. Accessed via: https://www.researchgate.net/profile/Stephanie_Peay/publication/228388305_Guidance_on_works_affecting_white-clawed_crayfish/links/552d72c80cf29b22c9c4f52e.pdf

⁴⁵ CIEEM (April, 2013). Competencies for Species Survey: White-clawed Crayfish.

⁴⁶ CIEEM's Competency Framework. Available at: <https://www.cieem.net/competency-framework> [Accessed 15/02/2023].

⁴⁷ A Field Identification Skills Certificate is a test developed by the Botanical Society of Britain and Ireland that determines botanical skill level on a scale from 1 (beginner) to 5 (professional) with 6 being awarded in exceptional cases. Further details are available online: Field Skills – Botanical Society of Britain & Ireland (bsbi.org)

⁴⁸ AtkinsRéalis (2024). Environmental Statement Volume 4: Appendix A9.20: Botanical Survey Report

habitats present). The additional areas associated with the extension of the Pipeline Scheme northwards into the main Havant Thicket Reservoir site (Section 10) were also not surveyed, as they are located in an active construction site and previous habitat data for these areas has been used for the purpose of the assessment.

- 2.51. Whilst the walkover survey worked to a 30 m buffer for badger, access to areas within 30 m of the Site (surface work locations only) was restricted to publicly accessible land or land owned by Portsmouth Water. As such, it was not possible to access privately owned land, including residential properties, that fell within the Badger Survey Area. Additionally, dense vegetation within the Badger Survey Area also limited access in some areas.
- 2.52. Dense vegetation and areas of privately owned land also prohibited access to some areas during the otter and water vole survey. The survey was also undertaken outside of the appropriate survey season for water vole, with activity much less frequent during winter months meaning field signs are scarce. A lack of in-channel vegetation during winter months also prevented surveyors from accurately assessing the habitat suitability for water vole.
- 2.53. Hermitage Stream at the time of the updated otter survey undertaken in October 2023, was in spate. Therefore, the Stream and bankside was inaccessible and any field signs indicating the presence of otter such as feeding remains or spraints will have been washed away. To account for this limitation, previous survey information from the March 2023 survey, and historical records of otter, were utilised to determine the presence/likely absence of otter within this section of Hermitage Stream.
- 2.54. The search for waterbodies within 500 m of the Site was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all waterbodies within 500 m of the Site boundary and, therefore, some waterbodies may not have been identified.
- 2.55. The list of invasive non-native plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The field surveys checked for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, cotoneaster, yellow azalea, few-flowered leak, montbretia, giant rhubarb, Japanese rose, three-cornered garlic, fanwort, floating pennywort, curly waterweed, water hyacinth, floating water primrose, parrot's feather and waterweeds (all species of the genus Elodea). Other invasive species listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) may not have been recorded. Due to the walkover surveys being conducted outside of the core growing season, it is possible that evidence of the invasive non-native plant species listed above may have been missed.
- 2.56. Cryptic taxa such as some species of plant, invertebrates and fungi, could not be adequately surveyed at the time of the surveys. These groups require specialist surveys, and survey windows are generally highly restrictive. However, when considering the desk study results, the nature of the habitats present across the Site and in the surrounding landscape, this is not considered to be a significant limitation.
- 2.57. The desk study reviewed the Woodland Trust Veteran Trees inventory. This provides records of ancient, veteran and notable trees, but is not an exhaustive list, and other ancient, veteran and notable trees may be present in the area. The walkover surveys aimed to identify such features, and tree surveys were carried out by a qualified arboriculturist across the entire Site (surface work locations only). As such, this is not considered a constraint.
- 2.58. HBIC records are not exhaustive, and the absence of records does not necessarily demonstrate the absence of a species.
- 2.59. The above limitations will be addressed through taking the precautionary approach within the appraisal.

3. Results

Statutory and Non-statutory Designated Sites

- 3.1. Table 3-1 and Table 3-2 details the statutory and non-statutory designated sites for nature conservation (respectively) identified through the desk study. These are shown on Figure 2.2 Pipeline Environmental Constraints in ES Volume 2.

Table 3-1 – Statutory designated sites for nature conservation within 2 km⁴⁹ of the Site

Site name	Designation	Location of designated site ⁵⁰	Features of interest ⁵¹
Sites of International importance			
Chichester and Langstone Harbours	Ramsar site	890 m south of the Site	Schedule 1 bird species (wintering/passage): black-tailed godwit, dark-bellied brent goose, dunlin, redshank, ringed plover and shelduck.
Solent Maritime	Special Area of Conservation (SAC)	890 m south of the Site	Diverse habitat types including: sandbanks, estuaries, mudflats and sandflats, coastal lagoons, Atlantic salt meadows. Presence of Desmoulin's whorl snail.
Chichester and Langstone Harbours	Special Protection Area (SPA)	890 m south of the Site	Extensive Schedule 1 birds species including: dark-bellied brent goose, curlew, dunlin, pintail, wigeon and redshank. As well as breeding aggregations of common tern, little tern and sandwich tern. Diverse habitat types including: seagrass beds, saltmarsh, coastal lagoons, mudflats and sandflats.
Sites of National Importance			
Langstone Harbour	Site of Special Scientific Interest (SSSI)	890 m south of the Site	Extensive Schedule 1 birds species including (wintering/passage): dark-bellied brent goose, curlew, dunlin, pintail, wigeon and redshank. As well as breeding aggregations of common tern, little tern and sandwich tern. Diverse habitat types including: seagrass beds, saltmarsh, coastal lagoons, mudflats and sandflats. Royal Society for the Protection of Birds (RSPB) Reserve.
Chichester Harbour	SSSI	1.8 km southeast of the Site	
Sites of Local importance			
Farlington Marshes	Local Nature Reserve (LNR)	1.7 km southwest of the Site	Schedule 1 bird species (wintering/passage): black-tailed godwit, dark-bellied brent goose, dunlin, redshank, ringed plover and shelduck.

⁴⁹ This is the zone of influence for designated sites.

⁵⁰ Where designated sites are situated outside of the Site boundary, the distance and direction is given to the closest point that the designated site is from the Site.

⁵¹ Including qualifying features of internationally designated sites and reasons for designation for SSSIs.

Site name	Designation	Location of designated site ⁵⁰	Features of interest ⁵¹
Hazelton Common	LNR	1.9 km northwest of the Site	The LNR comprises 40 acres of lowland heathland, within which widespread species of reptile, various species of butterfly and breeding birds, as well as priority invertebrates are present. The main pond within this LNR has previous records of breeding great crested newts.

- 3.2. The statutory sites are largely designated as a result of hosting assemblages of nationally and internationally important bird species. The Pipeline Scheme will not impact the qualifying bird species of these sites as discussed below (para 3.63 to 3.68). However, all sites are hydrologically connected to the Pipeline Scheme other than Hazelton Common LNR. As such, a Habitats Regulations Assessment⁵² (HRA) (Appendix 9.1 in ES Volume 4) has been undertaken to inform the Stage 1 Screening and Stage 2 Appropriate Assessment of likely significant effects to the European Sites associated with the Pipeline Scheme.
- 3.3. A total of 51 non-statutory designated sites were identified within 2 km of the Pipeline Scheme. The Sites of Interest for Nature Conservation (SINCs) that are hydrologically connected to or located within close proximity to the Site and, therefore, may pose a constraint to the Pipeline Scheme are presented in Table 3-2. The remaining SINCs are listed in Table A-1 in Appendix A.

Table 3-2 - Non-statutory designated sites for nature conservation within 2 km⁵³ of the Site

Site name	Designation	Location of designated site ⁵⁴	Features of interest ⁵⁵
Great Copse, Havant	SINC	Intersects the Site within the working area of Shaft 8	Ancient woodland and lowland mixed deciduous woodland (priority habitat).
Thicket Lawn	SINC	Intersects the Site within the working area of Section 9	Wet woodland (priority habitat), lowland meadow (priority habitat) and purple moor grass and rush pasture (priority habitat).
High Lawn	SINC	Intersects the Site within the working area of Section 9	Wet woodland (priority habitat) within the Site, as well as lowland meadow (priority habitat), purple moor grass and rush pasture (priority habitat) in the wider area ^{9,10} .
Middle Clearing	SINC	Intersects the Site at Section 10	Lowland mixed deciduous woodland (priority habitat), which has since been lost as a result of the main Havant Thicket Reservoir scheme.
Thicket Bottom Woods & Lake	SINC	Intersects the Site at Section 10	Round Wood ancient woodland and lowland mixed deciduous woodland (priority habitat), which has since been lost as a result of the main Havant Thicket Reservoir scheme.

- 3.4. Wet woodland priority habitat within High Lawn SINC will be directly lost as a result of construction works necessitated by the Pipeline Scheme. However, no qualifying features of other non-statutory

⁵² AtkinsRéalis (2024). Environmental Statement Volume 4 – Appendices: Appendix 9 Biodiversity A9.1 Habitats Regulation Assessment: Stage 1 Screening Report to Inform Stage 1 and Stage 2 Appropriate Assessment

⁵³ This is the zone of influence for designated sites.

⁵⁴ Where designated sites are situated outside of the Site boundary, the distance and direction is given to the closest point that the designated site is from the Site.

⁵⁵ Including qualifying features of internationally designated sites and reasons for designation for SSSIs.

designated sites will be impacted and are not anticipated to pose a constraint to the Pipeline Scheme.

National and Local Planning Policy

- 3.5. The Havant Borough Core Strategy³ is the current planning policy for Havant along with the 'Local Plan (Allocations)'. Policies within the Core strategy that are relevant to the biodiversity assessment are provided below, with further detail of the policy specific to Havant Thicket Reservoir:
- Policy CS11 Protecting and Enhancing the Special Environment and Heritage of Havant Borough;
 - Policy CS13 Green Infrastructure;
 - DM8 Conservation, Protection and Enhancement of Existing Natural Features; and
 - Policy CS18 Strategic Site Delivery (Strategic Site 2 Havant Thicket Reservoir).
- 3.6. The specific points of the Policy CS18 Strategic Site 2 Havant Thicket Reservoir which relate directly to ecology include:
- Natural and rural character should be conserved in particular by limiting impacts on biodiversity including the creation of additional habitats; compensating for the loss of, and effects on, sites of importance for nature conservation, the listed park and conservation area; enhancing adjacent sites of importance for nature conservation; ensuring that the pipeline avoids Great Copse, which should be protected during construction; integrating the reservoir and the new landscape with the historic landscape of the Sir George Staunton Conservation Area and existing woodland;
 - Minimising the loss of ancient woodland and trees;
 - The potential impacts on the Langstone and Chichester Harbours Ramsar, SPA and SSSI as well as the Hermitage Stream should be minimised in terms of ecology, water quality and flow effects;
 - Opportunities for biodiversity enhancements associated with the Havant Thicket Reservoir and the Hermitage Stream should be realised wherever possible; and
 - Opportunities arising from the Pipeline Scheme are taken to enhance the existing habitats along the stream corridors.

Irreplaceable Habitats

- 3.7. Table 3-3 details the locations of irreplaceable habitats⁵⁶ identified through the desk study and the findings from the field surveys. These are shown on Figure 9.9 Priority and Irreplaceable Habitats in ES Volume 3.

Table 3-3 – Irreplaceable habitats within 500 m⁵⁷ of the Site

Irreplaceable habitat type	Irreplaceable habitat details	Location of irreplaceable habitat ⁵⁸
Ancient woodland	The Avenue	Intersected by Section 10
Ancient woodland	Middle Clearing	Intersected by Section 10
Ancient woodland	Great Copse	Located between Shaft 7 and 8. The 'surface' work locations are outside of the boundary of the Ancient woodland and Natural England's recommended 15 m buffer ⁵⁹ for ancient woodland

⁵⁶ As defined in the National Planning Policy Framework (2021): Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, considering their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.

⁵⁷ This is the zone of influence for ancient woodland.

⁵⁸ Where irreplaceable habitats are situated outside of the Site boundary, the distance and direction is given to the closest point that the irreplaceable habitat is from the Site.

⁵⁹ [Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions) [accessed 15/02/2023]

Irreplaceable habitat type	Irreplaceable habitat details	Location of irreplaceable habitat ⁵⁸
Ancient woodland	Round Wood	Approximately 107 m north of Section 10
Ancient woodland	Woodland located within Staunton Country Park	Approximately 214 m northeast of Section 9
Ancient woodland	Wakeford's Copse	Approximately 230 m east of Section 9
Ancient woodland	Cabbagefield row	Approximately 258 m west of Section 10
Ancient woodland	Bell's Copse	Approximately 370 m west of the Section 10
Ancient woodland	Hammond's Lands Copse	Approximately 414 m north of Shaft 8

- 3.8. All irreplaceable habitat types within 500 m of the Site comprise ancient woodland, none of which will be impacted by the Pipeline Scheme. At the time of this report being published, the ancient woodland within Middle Clearing and The Avenue has been cleared to facilitate construction works for the main Havant Thicket Reservoir scheme. A separate mitigation and compensation package has been published with respect to these habitats⁶⁰. The remaining ancient woodland within 500 m of the Pipeline Scheme is all outside of the Pipeline Scheme redline boundary and will not be directly impacted. However, due to the close proximity of the ancient woodland to the Site, and hydrological connectivity, the Proposed Pipeline Scheme may cause indirect impacts to the irreplaceable habitats.

Ancient, Veteran and Notable Trees

- 3.9. Table 3-4 details the locations of ancient, veteran and notable trees identified through the desk study and during the arboricultural surveys undertaken by AtkinsRéalis⁶¹. Tree numbers have been marked with an asterisk if they were identified during the desk study.
- 3.10. Classifications for trees identified during the desk study are based on criteria outlined in the Woodland Trust Ancient Tree Inventory guidance⁴. For trees identified from the field survey, the classifications are explained in full within the Arboricultural Impact Assessment (AIA) (Appendix A9.14). Potential ancient, veteran and notable trees within the Site are shown on Figure 9.10 Veteran Trees in ES Volume 3.

⁶⁰ AtkinsRealis (2022). Havant Thicket Reservoir Project. Landscape and Ecology Management Plan

⁶¹ AtkinsRealis (2023). Environmental Statement Volume 4: Appendix A9.18: Pipeline Impact Arboricultural Assessment

Table 3-4 – Potential ancient, veteran and notable trees within 500 m⁶² of the Site

Tree ID	Location of ancient, veteran or notable trees		Description of trees		Source
	OSNGR	Distance from Site	Species	Classification	
T027	SU 71607 08851	82 m west of Section 9	Common Oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T036	SU 71721 08832	27 m west of Section 9	Sweet Chestnut	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T037	SU 71721 08832	27 m west of Section 9	Sweet Chestnut	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T065 (T01*)	SU 71303 08186	Within Shaft 6	Apple sp.	Veteran	Woodland Trust Ancient Tree Inventory
T083	SU 71207 07809	Within Shaft 5 (Purbrook Way)	Common Oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T128	SU 71211 07259	Within Shaft 4 (West of Stockheath Lane)	Common Oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T189	SU 70430 06259	Within Bedhampton site	Beech	Veteran	AtkinsRéalis Arboricultural Assessment, 2023
T023	SU 7148408973	Adjacent to Shaft 8 (Lake Stream)	Common Oak	Locally notable	AtkinsRéalis Arboricultural Assessment, 2023
T082 (CP)	SU 71964 08702	28 m west of Shaft 8	Common oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T075 (CP)	SU 71709 08881	12 m south of Section 9	Common Oak	Locally notable	AtkinsRéalis Arboricultural Assessment, 2023
T083 (CP)	SU 71211 07259	45 m west of Shaft 8	Common Oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023
T077 (CP)	SU 71851 08750	Within Shaft 8	Common Oak	Veteran/ notable	AtkinsRéalis Arboricultural Assessment, 2023

⁶² This is the zone of influence for veteran trees.

Tree ID	Location of ancient, veteran or notable trees		Description of trees		Source
	OSNGR	Distance from Site	Species	Classification	
T02*	SU 71723 08524	120 m south of Shaft 8	Oak sp.	Veteran	Woodland Trust Ancient Tree Inventory
T04*	SU 72066 08978	153 m north of Shaft 8	Oak sp. (sunken)	Veteran	Woodland Trust Ancient Tree Inventory
T03*	SU 71703 08464	180 m south of Shaft 8	Oak sp.	Notable	Woodland Trust Ancient Tree Inventory
T05*	SU 70273 06411	206 m west of Shaft 1	Common yew	Ancient	Woodland Trust Ancient Tree Inventory
T06*	SU 71983 09026	207 m north of Shaft 8	Pedunculate oak	Veteran	Woodland Trust Ancient Tree Inventory
T07*	SU 70227 06418	252 m west of Shaft 1	Common yew	Ancient	Woodland Trust Ancient Tree Inventory
T08*	SU 71946 09039	226 m north of Shaft 8	Common horse chestnut (stump)	Ancient	Woodland Trust Ancient Tree Inventory
T10*	SU 7238 0875	367 m west of Shaft 8	Pedunculate oak	Veteran	Woodland Trust Ancient Tree Inventory
T09*	SU 7240 0885	395 m west of Shaft 8	Pedunculate oak (stump)	Veteran	Woodland Trust Ancient Tree Inventory

Habitats and Priority Plants

- 3.11. Figure 9.7 in ES Volume 3 presents the habitats within the Site, mapped according to the UKHab classification as detailed in Section 2.13.
- 3.12. **Bedhampton Pumping Station site and Shaft 1** primarily comprises other neutral grassland (TN 4) with scattered trees, mixed scrub including butterfly bush, bramble and blackthorn (TN 5), and developed land of hardstanding and buildings. An area within this site, which was inaccessible at the time of survey, comprises a section of solar panels surrounded by grassland.. Hermitage Stream also runs through the working area for Shaft 1, where the banks and riverbed of the watercourse are heavily reinforced.
- 3.13. **Shafts 2 and 3** are both present within the same relative habitat type, which comprises a modified grassland playing field, bordered by a line of trees (TN 7). Species diversity is low, due to the high level of disturbance caused by dog walkers and sport's players.
- 3.14. **Shaft 4** is primarily comprised of modified grassland and scattered trees, and is intersected by hardstanding public footpaths. A small parcel of lowland mixed deciduous woodland priority habitat and scattered scrub is present, along with a small strip of other neutral grassland to the south of the shaft (TN 10).
- 3.15. The **Emergency Discharge Chamber** is situated within lowland mixed deciduous woodland priority habitat and other neutral grassland (TN 12), with an additional parcel of other broadleaved woodland located amongst the other neutral grassland to the north of the working area. The working area encompasses Hermitage Stream, with the proposed Emergency Discharge Chamber to include a new spillway connected to the stream, a stilling pond and potential scour protection. The stream in this location is not reinforced and has exposed earth banks, which is the same for all surface work locations north of this area. A small parcel of aquatic marginal vegetation dominated by common reed, is present to the west of the stream within the working area (TN 13). The confluence of Hermitage Stream and Riders Lane Stream is located to the southwest of the working area, with Riders Lane Stream following the southern margin of the working area.
- 3.16. **Shaft 5** is primarily comprised of other broadleaved woodland to the south of Purbrook Way road, and other neutral grassland to the north. Bramble scrub and broadleaved trees line Riders Lane Stream, which runs through the working area. Hardstanding in the form of footpaths, pavements and roads are also present within the working area.
- 3.17. **Shaft 6** is intersected by Dunsbury Way road and associated pavements. The habitats either side of the hardstanding comprise other neutral grassland, modified grassland and bramble scrub, including scattered trees and scrub. West of the road, wet woodland priority habitat and dense scrub lines Riders Lane Stream, which runs through the working area.
- 3.18. The habitat associated with Riders Lane Stream in Shaft 6 continues into **Shaft 7**, where the working area predominantly comprises bramble scrub and wet woodland priority habitat, with a parcel of other neutral grassland. A large proportion of the working area also includes hardstanding in the form of footpaths, pavements, roads and a compound area.
- 3.19. **Shaft 8** is the largest shaft and most diverse working area for habitat types and is situated within Staunton Country Park and Great Copse field, south of Middle Park Way. The predominant habitat within the working area comprises other neutral grassland with scattered scrub and rushes. Riders Lane Stream runs through the working area and is fed by an ephemeral stream (TN 27), which floods to form a pocket of wet woodland to the south of the Shaft working area.
- 3.20. **Section 9.** The pipeline then extends from Shaft 8 through Staunton Country Park to the main reservoir site, through High Lawn SINC and Thicket Lawn SINC. The habitat type comprises other neutral grassland and a parcel of lowland mixed deciduous woodland priority habitat type to the north of the Section.
- 3.21. **Section 10** runs through the main reservoir site and comprises other neutral grassland, with a small parcel of purple moor grass and rush pasture priority habitat to the south of the Section. The Section continues through the reservoir site into the centre of the reservoir., Table 3-5 lists all of the UKHab Level 3, 4 and 5 habitats present within the Site (surface works locations only), and identifies those Level 4 and Level 5 habitats which are protected and/or listed as priority habitats. The table also provides details of the area of each habitat within the Site and the proportion of the Site this makes up. Habitats are mapped on Figure 9.7 UK Habitat Classification (UKHab) survey in ES Volume 3. A full list of plant species recorded is provided in Appendix A.

Table 3-5 – Habitat types within the Site (surface work locations only)

UKHab level 3, 4 or 5 habitat type	Location of habitat	Area of habitat/ distance of linear feature	
		Permanently lost m ² / m	Temporarily lost m ² / m
Aquatic marginal vegetation (f2d)	Emergency Discharge Chamber	139 m ²	-
Other neutral grassland (g3c) – includes areas of potential lowland meadow priority habitat (see 3.21)	Shafts 1, 4, 5, 6, 8 and Emergency Discharge Chamber	72438 m ²	32966 m ²
Modified grassland (g4)	Shafts 1, 2, 3, 4, 5, 6, 7, 8	1882 m ²	15190 m ²
Dense scrub ⁶³ (h3)	Throughout the Site	1555 m ²	1085 m ²
Other Hedgerow (h2b)	Throughout the Site	226 m	
Rivers and streams (r2)	Throughout the Site	180 m ²	253 m ²
Built-up areas and gardens (u1)	Throughout the Site	19 m ²	
Developed land; sealed surface (u1b)	Throughout the Site	130 m ²	3872 m ²
Built linear features (u1e)	Throughout the Site	961 m ²	3814 m ²
Lowland mixed deciduous woodland (w1f) priority habitat	Throughout the Site	1908 m ²	1163 m ²
Line of trees (w1g6)	Throughout the Site	1929 m	81 m
Wet woodland (w1d) priority habitat ⁶⁴	Shaft 6, 7, 8 Thicket Lawn SINC and High Lawn SINC (Staunton Country Park)	2504 m ²	1774 m ²

⁶³ Includes mixed scrub, bramble scrub and other blackthorn scrub.

⁶⁴ This habitat has been assigned by using data available from the HBIC NVC survey reports for High Lawn and Thicket Lawn (Hampshire Biodiversity Information Centre, (2017), which are present within Shaft 8 and Section 9. Wet woodland priority habitat has been assigned to areas previously classified within the HBIC NVC survey report as W1 (wet woodland and W1 are corresponding habitat types).

UKHab level 3, 4 or 5 habitat type	Location of habitat	Area of habitat/ distance of linear feature	
		Permanently lost m ² / m	Temporarily lost m ² / m
Rivers and lakes (r)	Shaft 5, 6, 8	56 m	28 m
Other woodland; broadleaved (w1g)	Throughout the Site	1261 m ²	1148 m ²

Priority Habitats

- 3.22. HBIC returned multiple parcels of priority habitat within 1 km of the Pipeline Scheme including two parcels of sand dunes, one parcel of coastal vegetated shingle, 18 parcels of coastal saltmarsh, 18 parcels of intertidal mudflats, 47 parcels of coastal and floodplain grazing marsh, eight parcels of lowland meadow, 96 parcels of lowland deciduous woodland, one parcel of purple moor grass and rush pasture, four parcels of wet woodland and 26 parcels of wood pasture and parkland. There are parcels of lowland deciduous woodland, lowland meadow, wood pasture and parkland, purple moor grass and rush pasture, wet woodland and coastal and floodplain grazing marsh within the Site (surface work locations only).
- 3.23. The field surveys undertaken during 2023 identified parcels of lowland mixed deciduous woodland within Shafts 4, 8, Section 9 and the Emergency Discharge Chamber and wet woodland within Shafts 6, 7, 8 and Section 9. Despite the previous data returned by HBIC, detailed botanical surveys conducted by AtkinsRéalis in July and August 2023⁶⁵ did not identify purple moor grass and rush pasture or lowland meadow priority habitats within the Pipeline Scheme boundary in Shaft 8 and Section 9. The detailed botanical survey results for Shaft 8 and Section 9 are presented in Figure 9.8: National Vegetation Classification (NVC) Survey in ES Volume 3.
- 3.24. The field surveys conducted in January, February and November 2023 did not find conditions which indicated that the parcels of land identified as the priority habitat type coastal and floodplain grazing marsh (TN 4, TN 10) met the criteria outlined in the JNCC description⁶⁶, as the parcels comprised areas of modified and other neutral grassland and no field signs were present to suggest the parcels were subject to seasonal inundation.
- 3.25. The priority habitats present within the Site are shown in Figure 9.9 Priority and Irreplaceable Habitats in ES Volume 3.

Priority Plants

- 3.26. HBIC provided 28 recent records of notable plant species within 1 km of the Site, of which one (divided sedge) comprises a recent record of a plant species listed under the UK BAP⁶⁷. Twenty-two of the 28 recent notable plant species records possess four-figure or six-figure grid references and, therefore, it is not possible to accurately confirm where these records are located in relation to the Site. However, based on the approximate locations provided, the closest records comprise records

⁶⁵ AtkinsRéalis (2024). Environmental Statement Volume 4: Appendix A9.20: Pipeline Botanical Survey Report

⁶⁶ Extract from JNCC Coastal and Floodplain Grazing Marsh habitat definition: Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing brackish or fresh water. The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed swamp communities. Accessed 08/04/23 at: <https://data.jncc.gov.uk/data/82b0af67-d19a-4a89-b987-9dba73be1272/UKBAP-BAPHabitats-07-CoastFloodGrazingMarsh.pdf>

⁶⁷ Divided sedge is the only UK BAP plant species recently recorded within 1 km of the Site.

for small-flowered buttercup⁶⁸ and opposite-leaved pondweed⁶⁹, which are approximately located in or around the working area of Shaft 1.

- 3.27. The updated field survey in November 2023 identified two priority plants, small-flowered buttercup and wall bedstraw in Shaft 1 (TN 32, TN 33). Both plants are listed on the Hampshire Rare Plants Register⁷⁰. Wall bedstraw is also listed as a nationally scarce plant, and listed as vulnerable on the Great British⁷¹ and English⁷² Red Lists. The location of the plants are shown in Figure 9.18: Ecological Constraints in ES Volume 3.

Protected and Priority Animal Species

- 3.28. Evidence of protected and priority species, or habitats with the potential to support protected and priority species are indicated on individual species survey plans. TN descriptions are provided in Appendix A. Details of legislation relating to protected species is provided in Appendix B.
- 3.29. Protected and priority species are not discussed further within this report where the following applies:
- A species distribution range does not cover the Site location; and
 - No evidence of the species was recorded within the Site and/or no potentially suitable habitat for the species has been recorded within the zone of influence of the species.

Badger

- 3.30. HBIC returned no recent badger records within 1 km of the Site.
- 3.31. The surveys identified three badger setts within the working area of Shaft 8, located along an earth bank associated with a parcel of wet woodland in Staunton Country Park. All sett tunnels headed south, towards Middle Park Way road. The locations of the setts are detailed in Table 3-6 and shown in Figure 9.11 Badger survey in ES Volume 3.
- 3.32. Mammal pathways were also recorded within the working area of Shaft 8, within a patch of other neutral grassland south of Middle Park Way Road. The pathways appear to connect the three setts to Great Copse ancient woodland, with many of the pathways created by pushing through dense scrub or hedgerow and match the size profile of badger. No field signs of badger were recorded within these pathways, with the pathways potentially used by other mammals including dogs.

Table 3-6 - Badger field signs within the Site

Sett type	Usage	Location		
		OSNGR	Shaft number	Target note
Outlier sett	Partially used	SU 71842 08687	8	27
Outlier sett	Partially used	SU 71849 08689	8	28
Outlier sett	Partially used	SU 71886 08691	8	29

- 3.33. Great Copse provides suitable habitat for foraging and sett creation, however, no setts were found within the woodland. Much of the habitat located within Staunton Country Park also provides foraging and commuting suitability for badger with the presence of dense scrub, woodland, pasture and hedgerows. All of the surface works locations provide suitable habitat for foraging and commuting badger and are connected to suitable surrounding habitat also.

⁶⁸ The BSBI plant atlas (<https://plantatlas2020.org/atlas/2cd4p9h.cq8> Accessed 17/05/23) describes this species as 'An annual herb of dry, disturbed habitats on a range of neutral and calcareous soils. Typical sites include broken turf on cliff edges, open, droughted slopes and banks, rabbit scrapes, tracks, poached gateways, building sites and gardens. The seeds appear to be long-lived, and populations may reappear after disturbance or persist for many years.'

⁶⁹ The BSBI plant atlas (<https://plantatlas2020.org/atlas/2cd4p9h.8y7> Accessed 17/05/23) describes this species as 'a perennial herb of shallow, clear, base-rich water which may grow in lakes and rivers, but is more frequent in smaller waters such as streams, canals, ditches and ponds.'

⁷⁰ [Hants Plants: a site for botanists in Hampshire](#) [accessed 06/12/2023]

⁷¹ [VP-GBRL_19_02_2021-1.xlsx \(live.com\)](#) [accessed 06/12/2023]

⁷² [England Red List 1.pdf \(bsbi.org\)](#) [accessed 06/12/2023]

- 3.34. Fox dens were recorded within the Bedhampton site⁷³, Shaft 3⁷⁴, Emergency Discharge Chamber⁷⁵ and Shaft 5⁷⁶ and two dead foxes were recorded within Shaft 4⁷⁷ and Shaft 8⁷⁸. A single mammal hole was also located within the Bedhampton site⁷⁹; although it was not possible to determine the species that had created the hole due to its position amongst dense bramble scrub, it is likely to have been created by rabbit or fox based on the small amount of spoil present and the small size of the entrance hole. Extensive rabbit burrows were recorded throughout Bedhampton site⁸⁰ and a disused rabbit hole was recorded within Shaft 8⁸¹. Evidence of burrowing mammals present throughout the Site showcases that the substrate is suitable for sett creation, as well as providing habitat suitable for foraging and commuting badgers.
- 3.35. Shafts 2 and 3 provide the lowest habitat suitability for badger, with the playing fields subject to disturbance and regular management through mowing. However, the fields are bordered by well-established hedgerows and a fox den⁸² was also found within the working area. Therefore, there is suitable habitat for foraging and commuting mammals within this working area.

Bats

- 3.36. HBIC provided 330 recent bat records, comprising 18 species, within 2 km of the Site. Each of the 330 recent bat records possess four-figure or six-figure grid references and, therefore, it is not possible to accurately confirm where these records are located in relation to the Site. However, based on the approximate locations provided by the grid references, six records are located within the Site and comprise records of three common pipistrelle, one soprano pipistrelle and two myotis sp. HBIC did not specify whether the records comprised any bat roost records.
- 3.37. The total records of each species are as follows:
- 1 record of Alcaethoe;
 - 13 records of Bechstein's;
 - 1 record of Brandt's;
 - 11 records of brown long-eared;
 - 127 records of common pipistrelle;
 - 3 records of Daubenton's bats;
 - 6 records of long-eared sp.;
 - 17 records of Myotis sp.;
 - 5 records of Nathusius's pipistrelle;
 - 12 records of Natterer's;
 - 23 records of noctule;
 - 10 records of pipistrelle sp.;
 - 32 records of serotine;
 - 46 records of soprano pipistrelle;
 - 4 records of unidentified species;
 - 4 records of western barbastelle;
 - 10 records of whiskered; and
 - 5 records of whiskered/Brandt's.
- 3.38. A search on MAGIC returned four granted European Protected Species (EPS) licences pertaining to bats within 2 km of the Site. The licenses were all issued for the destruction of a resting place for

⁷³ OSNGR SU 70623 06285

⁷⁴ OSNGR SU 70743 07168

⁷⁵ OSNGRs SU 71002 07557, SU 71001 07560, SU 70952 07608, SU 70880 07638 and SU 71062 07600

⁷⁶ OSNGR SU 71168 07869

⁷⁷ OSNGR SU 70924 07615

⁷⁸ OSNGR SU 71747 08805

⁷⁹ OSNGR SU 71886 08690

⁸⁰ OSNGRs SU 70740 06318, SU 70691 06318, SU 70692 06318, SU 70539 06358, SU 70481 06345 and SU 70555 06414

⁸¹ OSNGR SU 71886 08690

⁸² OSNGR SU 70743 07168

common pipistrelle and soprano pipistrelle, the closest of which is in a residential area directly adjacent to the Bedhampton site. Additionally, an EPS licence for bats is currently in place for the adjacent Havant Thicket Reservoir scheme (2020-50625-EPS-AD2-4). A total of 36 bat roosts were recorded during the enabling works for Havant Thicket Reservoir, comprising 32 day roosts from a total of six species⁸³, three maternity roosts from a total of two species⁸⁴ and one mating roost⁸⁵. No bats are currently breeding within the reservoir site, however the site is still being utilised for foraging and commuting⁸⁶.

- 3.39. The GLTAs and aerial inspections conducted in March 2023 identified 25 trees with PRFs for bats. There were eight trees which were assessed as providing moderate potential to support roosting bats and four trees assessed as providing high potential to support roosting bats. The remaining 13 trees were assessed as providing low potential to support roosting bats.
- 3.40. The additional GLTAs and aerial inspections undertaken in November 2023 identified two trees with moderate potential to support roosting bats, and two trees with high potential to support roosting bats. PBRAs were also conducted in November 2023 for the two buildings within the Bedhampton site, referred to as Bedhampton 1 (B1) and Bedhampton 2 (B2). B1 was assessed as providing high potential to support roosting bats, including the potential to support a maternity roost, whilst B2 was assessed as providing moderate potential to support roosting bats.
- 3.41. A repeat PBRA was carried out on 30th January 2024 and the buildings were confirmed as high potential (B1) and moderate potential (B2). Portsmouth Water also confirmed that a bat roost was identified in Bedhampton 1 in 2015 with a single common pipistrelle recorded, concluding that the building was likely used as a day roost by pipistrelles.
- 3.42. No hibernating bats or signs of bats were encountered during hibernation inspection surveys however a single common pipistrelle call was recorded on 2nd February 2024 at 18:28 in part of Bedhampton 1 (the part of the building is referred to as 'the Training Room'). The full results of the GLTAs, aerial inspections and PBRAs are provided in Table 3-7 and shown in Figure 9.12 Preliminary Bat Roost Assessments results in ES Volume 3.
- 3.43. A total of 16 trees and two buildings with roosting potential are present within the Site (rows are highlighted in Table 3-7), comprising nine low potential trees, five moderate potential trees and two high trees.. One building has high suitability to support roosting bats, and the other has moderate suitability. Both buildings are situated within the Site.

⁸³ Bechstein's, brown long-eared, common pipistrelle, Daubenton's, Natterer's and noctule.

⁸⁴ Brown long-eared and Natterer's.

⁸⁵ Noctule.

⁸⁶ ECOSA (2023). Havant Thicket Reservoir. 2023 European Protected Species Ecological Monitoring and Ecological Supervision Report.

Table 3-7 – Results of the GLTAs, aerial inspections and PBRA's for the Site (surface work locations only)

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
100	Alder	Moderate	SU 70672 06328	Moderate	Ground level vertical wound, approximately 1m in length. Extending upwards into the tree 25cm. Clear and clean inside with woodlice present.	4 m east of Bedhampton site
99	Silver birch	Low	SU 70589 06352	Low	Linear crack on the main trunk. 10cm ingress upwards into the tree. Potential for a single bat to be present.	Within Bedhampton site
98	Norway Maple (DEAD)	Moderate	SU 70535 06381	Moderate	Group of woodpecker holes. Some open to top nut generally clean and clear inside.	Within Bedhampton site
		Moderate	SU 70535 06382		Horizontal crack in tree, clean inside with 20cm ingress into the limb.	
97	Oak	High	SU 70684 06973	High	Woodpecker hole. Clean and clear inside with 20cm ingress into limb.	4 m west of Shaft 2
		High	SU 70684 06974		Long tear out with gaps under occluded bark. Some hanging bark also present on vertical dead limb.	
		Low	SU 70684 06975		Large south facing chamber, but with limited cover for any potential roosting bats.	
96	Oak	Low	SU 707010 68667	Low	Honey fungus present. Shallow cracks and crevices throughout tree but all of which were shallow and not likely to support any more than a single bat within this tree.	Within Shaft 2
95	Oak	Moderate	SU 70716 068721	Moderate	Multiple features within canopy of tree that were associated with poor pruning practise. Bark had not occurred properly over wounds and there had been rot penetrating into limbs. These were generally shallow and exposed, but two of these wounds had ingress into limb up to 20cm. Canopy also clutter with epicormic growth, reducing the access into this tree for bats.	Within Shaft 2
94	Oak	Low	SU 70840 07196	Low	Pruning wound in limb. Shallow with limited upwards penetration.	16 m north of Shaft 3

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
		Low	SU 70840 07197		Pruning wound in limb. Shallow with limited upwards penetration.	
		Low	SU 70840 07198		Pruning wound in limb. Shallow with limited upwards penetration.	
93	Oak	Low	SU 70840 07196	Low	Multiple shallow features within the canopy of this tree. Nesting birds present within this tree (Parus major). Potential for low numbers of common bat species within cracks and gaps.	16 m north of Shaft 3
92	Oak	Low	SU 71293 07197	Low	Shallow woodpecker holes with limited ingress into tree, no more than 10cm. Mostly exposed but potentially able to shelter low numbers of common bat species. Close to road and street lighting.	5 m east of Shaft 4
91	Oak	Low	SU 71296 07210	Moderate	Shallow cavity facing west, with limited ingress into tree but enough shelter to support low numbers of common bat species.	14 m east of Shaft 4
		Moderate	SU 71296 07211		Large open cavity with potential shelter within for bats. Could potentially offer shelter for larger number of bats.	
90	Oak	Moderate	SU 71242 07234	Moderate	Deadwood with horizontal splits. Depth and space could give shelter for bat species, but some racks open to the top, limiting potential shelter.	Within Shaft 4
		Low	SU 71242 07235		Cavity on main trunk that penetrated upwards into tree 15cm. Clear and dry but limited in potential space and shelter for bats.	
		Low	SU 71242 07236		Cavity on horizontal limb. Limited ingress into tree, which was open and exposed.	
89	Oak	Low	SU 71240 07245	Low	Hole in main truck with a wide spacious cavity that contained evidence of previous usage by nesting birds (species unknown).	Within Shaft 4

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
		Low	SU 71240 07246		Wound on cut limb that did not occlude properly. Limited ingress into tree, but could potentially shelter low numbers of common bat species.	
88	Oak	Low	SU 71213 07265	Low	This tree was close to the watercourse. Woodpecker holes in limb. Some were started holes, but others had greater ingress into tree. Depth no more than 20cm, but potentially able to shelter low numbers of bats.	1 m west of Shaft 4
		Low	SU 71213 07266		Large horizontal cavity in low level limb. Grey squirrel present, but cavity did extend 20cm into limb.	
87	Crack Willow	Low	SU 70920 07613	Low	Low level cavity in main trunk, with an open face of 0.75m vertically aligned with the trunk. The depth of this feature was limited, no more than 15cm inwards, but this tree was next to a stream along a riparian corridor. Potential for low numbers of common bat species.	Within Emergency Discharge Chamber
86	Oak	Low	SU 70910 07677	Low	Close to road with street lighting, but there was a small cavity that extended inwards 10cm. Overall, this was open and clean, but could support low numbers of bat species.	Within Emergency Discharge Chamber
85	Oak	Low	SU 70908 07675	Low	East facing wound on underside of limb that had begun to rot, with a cavity forming. Presently, this feature was shallow and did not offer any penetration beyond 10cm into the tree. Close to road and street lighting but a single bat could find shelter within.	Within Emergency Discharge Chamber
84	Oak	Low	SU 71169 07815	Low	Woodpecker hole that formed an open and relatively exposed cavity. Potential shelter for low numbers of bats. Close to street lighting and the road.	Within Shaft 5
		Low	SU 71169 07816		Long horizontal split in limb, mostly facing upwards. Some shallow shelter in places that could support a single bat.	

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
83	Oak	Low	SU 71174 07818	Low	Close to road and street lighting. Linear vertical split in main trunk of tree. Not much ingress into tree, with a depth of no more than 5cm. Could support a single bat.	Within Shaft 5
82	Oak	Low	SU 71156 07811	Low	Close to road and street lighting. Multiple shallow cracks resulting from poor pruning technique. All of which were within the light cone of the street lighting. All were shallow but low numbers of bats could shelter here, depending on how well lit this tree was at night.	Within Shaft 5
81	Oak	Moderate	SU 71610 08331	Moderate	Tree close to stream and potential flight lines. Large and spacious cavity with some upward penetration of 15cm. Could potentially support bat species within this feature.	19 m north of Shaft 7
		Moderate	SU 71610 08332		Cavity on horizontal limb overhanging path. Relatively clean and clear within, with ingress of 20cm. Could offer shelter to low numbers of common bat species.	
80	Oak	High	SU 71421 09080	High	Woodpecker hole. Generally dusty and dirty inside, with a layer of detritus as the base. 15cm ingress into tree. Bats could potentially shelter within.	6 m west of Shaft 8
		High	SU 71421 09081		Large wound/ cavity with cracks and crevices around the edge. Some ingress upwards of 10cm. Potential to shelter bat species within.	
		High	SU 71421 09082		split at end of limb. Some ingress into tree, to a depth of 10cm. Potential for bats to be present within.	
		High	SU 71421 09083		Cavity in limb. Generally open and exposed, but there was some shelter within that bats could exploit.	
		High	SU 71421 09084		Shallow wound on end of limb facing north. Ingress of 10cm, with some shelter possible.	

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
79	Oak	High	SU 71488 08981	High	Large cavity in main trunk of tree that was likely formed initially by woodpecker. This was large and extensive and able to support large numbers of bat species.	24 m west of Shaft 8
		High	SU 71488 08982		Small cavity at ground level which was clear and clean inside. 20cm ingress into tree but potentially able to support small numbers of bat species.	
		High	SU 71488 08983		Tear out facing north, with some cracks and gaps around where the bark had occluded.	
		High	SU 71488 08984		Cavity extending upwards into tree, with ingress upwards into tree to a depth of 20cm.	
78	Oak	High	SU 71641 08873	High	Extensive cavity at ground level that extended beyond the range of the endoscope 3m beyond. Clean and smooth, with some presence of woodlice. Cavity extensive enough to support large numbers of bat species.	41 m west of Shaft 8
77	Veteran Oak	Moderate	SU 71713 08883	Moderate	Cavity that extended 20cm into limb. Clear and clean with no detritus present in feature. Potential for some bats to be present.	10 m west of Shaft 8
76	Oak	Moderate	SU 71764 08806	Moderate	Woodpecker holes leading to a single chamber within limb. Clean and clear, with potential to support multiple bats.	5 m west of Shaft 8
T040	Beech (Veteran)	Moderate	SU 70430 06259	Moderate	Knot hole 15 m from ground level. Entrance 10cm by 15cm with 30cm ingress into tree, tapering at the end. Dry and clean within with small gaps into heartwood. Potential for low numbers of bats to be present.	Within Bedhampton site
		Moderate			Dry feature 17 m from ground level with 20cm ingress into tree. Narrow opening at face, I-shaped internally potentially provide shelter for low numbers of bats.	
		Negligible			Shallow woodpecker exploratory holes 20 m from ground level, but none penetrated into tree sufficiently for anything to shelter. Open and exposed	

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
T041	Scot's Pine	Moderate	SU 70424 06248	Moderate	Hazard beam 12 m from ground level, with deadwood hanging off end. A long horizontal spilt that provided 15cm ingress into limb. A structurally complex feature (internally) with numerous small locations that bats could potentially utilise for shelter. Although, likely to be low numbers of bats if present.	Within Bedhampton site
T042	Sycamore	High	SU 70428 06236	High	A very large cavity starting at 15m above ground level, with a split on the north-west and south-eastern face of the main trunk. Some of this feature is open to the top, but there are multiple chambers and splits within this cavity that potentially could be used by large numbers of bats to roost.	Within Bedhampton site
T043	Oak	High	SU 70417 06235	High	This tree was heavily diseased with large areas of deadwood. Multiple cavities were present throughout the length of this tree, with woodpecker holes, splits, canker and hanging bark. This tree was also directly adjacent to a watercourse and therefore could potentially support large numbers of multiple species of bat.	Within Bedhampton site
Bedhampton 1 building	n/a	High	SU 70596 06365	High	Confirmed hibernation roost for common pipistrelle bat (2024). Single common pipistrelle recorded in 2015, surveys concluded that the building was likely used as a day roost by pipistrelles. This building was divided into three distinct sections, each with a hipped roof, standing in close proximity but separated by solid brick walls. This building had multiple locations that bats could utilise for roosting. The location of the building was very close to water courses, which have high value as bat foraging habitat. The multiple potential roosting	Within Bedhampton site

Tree Tag Number	Species	Feature(s) Bat Roost Potential	OSNGR	Overall Bat Roost Potential	Description	Distance of tree from Site
					locations could support high numbers of bats within this building	
Bedhampton 2 building	n/a	Moderate	SU 70491 06275	Moderate	Situated to the south of the site area, this building comprised of a single large block, which was brick built with the main entrance on the western face. There is evidence that the hipped roof has been constructed over an older flat roof which is still intact. This appears to provide a roof void. Multiple entrance/ exit points were identified within the brickwork and drainage pipes into/ from the roof void. The building is completely undisturbed, with the roof void inaccessible from the internal pumping station. As such, no static detectors were left within this void. No bats or evidence of bats was found during any of the surveys.	Within Bedhampton site

- 3.44. Throughout the Site, the presence of hedgerows, scattered trees, woodland, and open grassland provides various foraging, commuting and roosting opportunities for bats. The watercourses along the Pipeline Scheme are likely to support invertebrates, providing further food sources for bats. The combination of habitats within and adjacent to Shaft 8 and Section 9 within Staunton Country Park are likely to be of particular importance for foraging, commuting and roosting bats. The associated riparian habitat also provides good connectivity between the shaft locations for commuting bats.

Hazel Dormouse

- 3.45. HBIC provided two recent hazel dormouse records within 1 km of the Site. The closest record was for two hazel dormice approximately 930 m northwest of the Site⁸⁷, adjacent to the Havant Thicket Reservoir.
- 3.46. A search on MAGIC returned no granted EPS licences for hazel dormice within 1 km of the Site. However, there is confirmed presence of hazel dormice within the Havant Thicket Reservoir, which is located immediately north of the working area for Section 9 and within the working area for Section 10. Additionally, an EPS licence for hazel dormice is currently in place for the adjacent Havant Thicket Reservoir scheme (2020-50257-EPS-AD2-2). A total of three individual hazel dormice were recorded during the enabling works for Havant Thicket Reservoir. Recent monitoring undertaken throughout 2023 has confirmed that dormice are still present within the reservoir Site, however, no active nests were recorded within the Pipeline Scheme⁸⁶.
- 3.47. Table 3-8 provides a summary of habitats suitable for hazel dormice within the Site. The location of each area summarised below is shown on Figure 9.13 Hazel dormouse habitat suitability assessment in ES Volume 3. Locations not summarised in Table 3-8 have been assessed as providing negligible habitat suitability for hazel dormice. The reference identification (for example HD1) refers to a specific feature or area of habitat identified during the survey that poses suitability for hazel dormouse. Each reference is independent and can be used to locate the point on Figure 9.13.
- 3.48. The field survey in January and February 2023 identified suitable connecting habitat from the Havant Thicket Reservoir throughout the Site, which may facilitate hazel dormouse dispersal within the Site. A connected network of dense scrub and woodland to the north of the working area of Section 9 in Staunton Country Park provides optimal habitat for foraging, commuting and nesting hazel dormouse which continues into Great Copse and Shaft 7. Key habitat indicator species such as honeysuckle is present within Great Copse and the Shaft 7 working area, the plant is a vital food source and provides nesting material for hazel dormouse.
- 3.49. Based on connectivity to areas with known dormouse populations, and the habitats present, it is assumed that habitats present in Section 9, Shaft 8 and Shaft 7 support commuting and foraging hazel dormice. The potential for hibernating hazel dormice in these areas is less, due to potential periodic flooding as described in Table 3-8 below. However, it cannot be ruled out as these areas may be suitable for hibernation in drier years.
- 3.50. Habitat suitability generally decreases further south from Shafts 7 to 1. There is evidence that regular flooding of suitable habitats occurs from the adjacent watercourses and that extensive human disturbance occurs.
- 3.51. Presence of hazel dormouse is considered to be unlikely at Shaft 6, Shaft 5, the Emergency Discharge Chamber and Shaft 1.
- 3.52. No habitat suitable for hazel dormouse was found at Shafts 2, 3 and 4.

⁸⁷ The closest working area to this record is Shaft 9. Extensive forestry clearance has been undertaken as a result of the Havant Thicket reservoir project, therefore there is unlikely to be suitable connecting habitat from the original record to Shaft 8.

Table 3-8 – Habitat suitability for hazel dormice within the Site (surface work locations only)

Location	Ref.	OSNGR	Suitability	Description
Bedhampton Site/Shaft 1	HD1	SU 70604 06309, SU 70569 06282, SU 70522 06323	Poor	Butterfly bush scrub and occasional areas of bramble scrub, with large gaps present amongst the butterfly bush. Noticeable absence of varied fruiting species and shrub species suitable for nesting hazel dormice and predator avoidance.
Emergency Discharge Chamber	HD2	SU 70998 07500	Sub-optimal	Broadleaved woodland and mixed scrub provides varied foraging opportunities throughout the year (fruiting species present include bramble, hawthorn, honeysuckle, blackthorn and pedunculate oak). The mature trees and variety of scrub provides safe commuting and summer nesting opportunities for the arboreal species, with species such as honeysuckle providing optimal nest building material. Dense ground flora and dense scrub provides coverage for hibernation nests. The working area is directly connected to woodland to the north, east and south along Hermitage Stream and Riders Lane Stream (connected via canopy), which further connects to woodland corridors along the wider watercourse network, thereby providing dispersal opportunities to the wider environment. However, the habitat is directly adjacent to Hermitage Stream and there is evidence to suggest the watercourse semi-regularly floods out to the adjacent habitats. As such, winter hibernation potential is likely to be low due to unpredictable and unstable ground conditions.
	HD3	SU 71003 07526	Sub-optimal	As above.
	HD4	SU 70927 07618	Poor	Scattered bramble scrub and mature grey poplar sp. and willow sp. provide limited predator avoidance and nesting opportunities for hazel dormice. The area of scattered trees and scattered scrub is not directly linked to the larger parcel of woodland and scrub to the south and would require hazel dormice to utilise the canopy of the trees present to navigate themselves to habitat of higher suitability. Cherry laurel saplings are located within this parcel and are likely to outcompete the native species present, thereby lowering the variety of species suitable for foraging hazel dormice (fruiting species present include bramble, honeysuckle and bluebell).
Shaft 5	HD5	SU 71182 07766	Poor	Broadleaved scattered trees along either side of Riders Lane Stream. Heavily shaded and evidence present to suggest that the stream floods semi-regularly and is unlikely to provide stable ground conditions suitable for hibernating hazel dormice; this is further evidenced by the presence of damp favouring species such as pendulous sedge. The habitat extends beyond the red line boundary to further areas of broadleaved scattered trees and dense and scattered scrub and, therefore, commuting/dispersal opportunities are present. Limited foraging opportunities are present due to the limited variety of fruiting species (fruiting species present include hawthorn, oak and bramble). Dispersal north of the habitat is not possible due to the presence of a culvert and major road.

Location	Ref.	OSNGR	Suitability	Description
	HD6	SU 71204 07817	Poor	Isolated parcel of bramble scrub would require hazel dormice to use fence lines or open grassland to commute to other areas of suitable habitat. There is a noticeable lack of foraging opportunities (fruiting species present include pedunculate oak and bramble) and the proximity to urban gardens is likely to attract predators.
	HD7	SU 71180 07825	Sub-optimal	Small patches of dense scrub and broadleaved scattered trees located along the eastern and western banks of Riders Lane Stream, which are connected to one another via the tree canopy, provide limited suitability for commuting and nest creation. There is a lack of varied flora (fruiting species present include bramble, pedunculate oak and hawthorn), which provides limited foraging opportunities, whilst the exposed bases to the majority of trees present limits winter hibernation opportunities. The stands of dense bramble scrub provide nesting opportunities, however, they are regularly managed. The habitats are located within close proximity to residential housing and, therefore, household pets are likely to act as predators further decreasing the suitability of the habitats. Although mature trees are present, there is a noticeable absence of varied ground flora and mid-level shrubs besides the scrub and, therefore, there is an absence of varied canopy heights favoured by nesting and commuting/dispersing hazel dormice. Dispersal south of the site is not possible due to the presence of a major road and culvert beneath the road. Dispersal northwards leads to higher quality woodland. However, the extension of habitat beyond the working area allows dispersal northwards along Riders Lane Stream.
Shaft 6	HD8	SU 71282 08157	Sub-optimal	Dense scrub and broadleaved scattered trees along the northern and southern banks of Riders Lane Stream, provide varied summer nesting opportunities for hazel dormice. There is a noticeable lack of varied foraging opportunities for the species (fruiting species present include hawthorn and bramble), however, the habitat present extends further west along Riders Lane Stream and has good connectivity to habitat further southwest of the watercourse. However, due to the proximity of the habitats present to Riders Lane Stream paired with evidence suggesting that the watercourse floods semi-regularly, the habitats are unlikely to provide stable ground conditions suitable for hibernating hazel dormice. The habitats present are also subject to regular human disturbance and the proximity to urban gardens is likely to attract predators.
	HD9	SU 71321 08182	Sub-optimal	Dense scrub and broadleaved scattered trees along the northern and southern banks of Riders Lane Stream, provide varied summer nesting opportunities for hazel dormice. There is a noticeable lack of varied foraging opportunities for the species (fruiting species present include hawthorn and bramble), however, the habitat present extends further east along Riders Lane Stream in, including to a large parcel of ancient woodland (Great Copse SINC). However, due to the proximity of the habitats present to Riders Lane Stream paired with evidence suggesting that the watercourse floods semi-regularly, the habitats are unlikely to provide stable ground conditions suitable for hibernating hazel dormice. The habitats present are also subject to regular human disturbance and the proximity to urban gardens is likely to attract predators.

Location	Ref.	OSNGR	Suitability	Description
Shaft 7	HD1 0	SU 71599 08306	Sub-optimal (Hazel dormouse assumed present)	Broadleaved woodland and dense scrub are linked to one another via the tree canopy. A variety of fruiting and flowering species provide foraging opportunities throughout the year (fruiting species present include honeysuckle, rose sp., bramble, bluebell and hazel). The variety of mature oak, mature ash and hazel coppice provides suitable summer and hibernation nesting opportunities. Dispersal opportunities are present along both banks of Riders Lane Stream, both to the east and the west. However, due to the proximity of the habitats present to Riders Lane Stream paired with evidence suggesting that the watercourse floods semi-regularly, the habitats are unlikely to provide stable ground conditions suitable for hibernating hazel dormice. The habitats present are also subject to regular human disturbance and the proximity to urban gardens is likely to attract predators.
Shaft 8	HD1 1	SU 71748 08647	Optimal (Hazel dormouse assumed present)	Dense scrub and ancient woodland (Great Copse SINC) along either side of Riders Lane Stream. Mature trees, varied ground flora and mid-level shrubs are present along the margin of the ancient woodland, which provide varied canopy heights favoured by nesting and commuting/dispersing hazel dormice. A variety of fruiting and flowering species provide foraging opportunities through the provision of fruits and terrestrial invertebrates throughout the year (fruiting and flowering species present include hazel, holly, honeysuckle, bluebell, hawthorn, oak, bramble, rose sp., lesser celandine and ivy). The area of scrub present is extremely dense and is likely to provide suitable summer and winter hibernation nesting opportunities for hazel dormice. Dispersal opportunities are present through the ancient woodland along both banks of Riders Lane Stream, to the south. Dispersal north of the site is not possible due to the presence of a major road and culvert beneath the road.
	HD1 2	SU 71809 08684	Sub-optimal (Hazel dormouse assumed present)	Broadleaved scattered trees and dense bramble scrub along either side of an ephemeral stream. The trees and scrub present are relatively dense and are likely to heavily shade the habitat during the core growing season, however, the density of vegetation present would provide summer nesting opportunities sheltered from predators. There is evidence present to suggest that the stream floods semi-regularly and is unlikely to provide stable ground conditions suitable for hibernating hazel dormice; this is further evidenced by wet, soft ground within the woodland. However, grass and rush tussocks may provide suitability for hibernating hazel dormice above ground level. The habitat meets Riders Lane Stream and the associated woodland and scrub habitat that borders the watercourse and, therefore, commuting/dispersal opportunities are present northwards into Staunton Country Park. Foraging opportunities are present through the variety of fruiting species present (fruiting species present include hawthorn, oak, holly, gorse and bramble). Dispersal south of the habitat is not possible due to presence of a culvert and major road.
	HD1 3	SU 71959 08746	Poor (Hazel dormouse)	A line of broadleaved scattered trees and patches of dense bramble scrub along an ephemeral stream. The trees and scrub present are relatively exposed and provide limited summer nesting opportunities. There is evidence present to suggest that the stream floods semi-regularly and is unlikely to provide stable ground conditions suitable for hibernating hazel dormice; this is further evidenced by wet, soft

Location	Ref.	OSNGR	Suitability	Description
			<i>assumed present)</i>	ground amongst the trees and scrub. However, grass and rush tussocks may provide suitability for hibernating hazel dormice above ground level.
	HD1 4	SU 71773 08741	Sub-optimal (<i>Hazel dormouse assumed present)</i>	Broadleaved woodland strip and dense bramble scrub along either side of Riders Lane Stream. The trees and scrub present are relatively dense and are likely to heavily shade the habitat during the core growing season, however, the density of vegetation present would provide summer nesting opportunities sheltered from predators. There is evidence present to suggest that the stream floods semi-regularly and is unlikely to provide stable ground conditions suitable for hibernating hazel dormice; this is further evidenced by wet, soft ground within the woodland. However, grass and rush tussocks may provide suitability for hibernating hazel dormice above ground level. The habitat present extends further along Riders Lane Stream and into Staunton Country Park's Leigh Water Lake Stream and provides a mature vegetated commuting route for dispersing hazel dormice to habitats available in the wider area.
Section 9	HD1 5	SU 71718 08897	Sub-optimal (<i>Hazel dormouse assumed present)</i>	As above.
	HD1 6	SU 71447 09092	Optimal (<i>Hazel dormouse assumed present)</i>	Broadleaved woodland strip with dense bramble and blackthorn scrub. Mature pedunculate oak trees present amongst dense scrub provide opportunities for foraging, commuting and summer nesting hazel dormice. There are limited fruiting species present (fruiting species present include oak, bramble, blackthorn and hawthorn), however, marginal grassland and small grassland clearings present adjacent and amongst the trees and bramble scrub are likely to support herbaceous plant species and terrestrial invertebrates favoured by foraging hazel dormice. The understory present has a combination of open and dense areas, providing a range of levels suitable for commuting hazel dormice and predator avoidance. The woodland strip is directly connected to hedgerow, scrub and woodland parcels in the wider area and provides a mature vegetated commuting route for dispersing hazel dormice.

Otter

- 3.53. HBIC returned no recent otter records within 1 km of the Site. The closest otter population is considered to be in Langstone Harbour⁸⁸, which is located approximately 800 m south of the Bedhampton site. The harbour is hydrologically linked to the Pipeline Scheme via Hermitage Stream, which then flows into Riders Lane Stream. No EPS licences have been granted within 1 km of the Site with respect to otter.
- 3.54. The field survey undertaken in March 2023 encompassed Hermitage Stream, Riders Lane Stream and an unnamed tributary of Riders Lane Stream (sometimes referred to as The Lake Stream). The updated survey in October 2023 covered an additional area within Hermitage Stream associated with the extended working area at the Bedhampton site. Figure 9.14 Water vole and otter survey (ES Volume 3) details the areas accessed during the field surveys in 2023.
- 3.55. The field survey undertaken in March 2023 identified a single otter spraint at OSNGR SU 71261 08004 in Riders Lane Stream, between Shafts 5 and 6 (TN 17). The spraint was old, however, it provided evidence to suggest that otters are using the stream for commuting and foraging, having likely moved northwards from Langstone Harbour. No additional evidence was recorded during the updated survey undertaken in October 2023, due to Hermitage Stream being in spate after heavy rain. The woodland adjacent to the stream, to the south of the Bedhampton site, was assessed as providing negligible suitability for otter holt creation due to the lack of vegetation cover.
- 3.56. The habitat within Hermitage Stream and Riders Lane Stream was assessed as providing suitability for commuting and foraging otter; with plentiful food supply and opportunity for spraint-marking. The streams run alongside all surface work locations other than Shaft 2, Shaft 3 and Section 10. The associated riparian habitat along the streams comprises dense vegetation, which provides suitability for otter resting sites. The dry culverts along the streams also provide suitability for otter resting sites, depending on water levels.
- 3.57. The high level of human influence around Shafts 4, 5, 6 and 7 lowers the potential for otter to use the surrounding habitat for resting, as a result of fly tipped debris and the high frequency of dogs. The vegetation across these areas is also less dense compared to the other surface work locations.

Water Vole

- 3.58. HBIC provided 28 recent water vole records within 1 km of the Site. The closest record was for a single water vole recorded approximately 715 m east of the Site within Lavant Stream, where many of the water vole records were. Lavant Stream is not hydrologically linked to the Pipeline Scheme.
- 3.59. The field survey undertaken in March 2023 assessed Hermitage Stream, Riders Lane Stream and an unnamed tributary of Riders Lane Stream (sometimes referred to as The Lake Stream). Figure 9.14 Water vole and otter survey (ES Volume 3) details the areas accessed during the field survey in March 2023. No field signs indicating the presence of water vole was observed throughout the Site.
- 3.60. Hermitage Stream runs through the Bedhampton site and Shaft 4, where the majority of the banks and riverbed were heavily reinforced (TN 8, TN 9) and provided no suitability for water vole due to a lack of in-channel vegetation and burrowing substrate. Habitat to the south of the Bedhampton site, outside of the working area, possessed exposed earth banks and an area of in-channel vegetation, which may provide burrowing, foraging and predator avoidance opportunities for water vole. However, this area was extremely isolated and, therefore, is unlikely to support a population of water voles.
- 3.61. The confluence of Hermitage Stream and Riders Lane Stream is located within the working area for the Emergency Discharge Chamber. In Hermitage Stream, the earth banks and in-channel and marginal vegetation present provides foraging, burrowing and predator avoidance opportunities for water vole (TN 13). Multiple rat burrows and rat droppings were identified, further evidencing the suitability of the substrate for burrowing mammals. However, this area is isolated and suboptimal due to disturbance levels from the public and it is considered unlikely to support a population of water voles.
- 3.62. Throughout the remainder of the Site, along Riders Lane Stream, the dense and overarching vegetation renders much of the stream unlikely to support water vole; this is due to the shade created by the vegetation preventing growth of in-channel and marginal vegetation required for

⁸⁸ ECOSA (2020). Preliminary Ecological Appraisal: Havant Thicket Winter Storage Reservoir, Rowlands Castle, Hampshire

foraging water voles and predator avoidance. Multiple rat burrows, prints and droppings were observed along the stream, however, no fields signs indicating the presence of water vole was recorded.

Breeding and Non-Breeding (Wintering and Passage) Birds

- 3.63. HBIC returned a total of 243 recent bird records comprising 71 species⁸⁹ within 1 km of the Site. Of these records, 83 records were for Annex 1 bird species, and 94 records were for BoCC red list species. Of the Annex 1 bird species record, there are three records of both ferruginous duck and kingfisher associated with Hermitage Stream. The kingfisher records were located within Shaft 1. There are two records of Mediterranean gull and one record of red kite within Shaft 4 and one little egret record within Shaft 8. Firecrest, a BoCC red list species, is present within Staunton Country Park. This species was observed during field surveys in May to July 2023 and HBIC returned nine records of this species in Staunton Country Park between 2013-20.
- 3.64. A Low Use site (H11), as defined by the Solent Waders and Brent Geese Strategy⁹⁰ (SWBGS), is located 500 m east of the Bedhampton site/Shaft 1. The site is classed as a supportive habitat for qualifying bird species of the Chichester and Langstone Harbours SPA, however, no qualifying species have been recorded here. During the ecological walkovers in January and February 2023, and during the updated surveys in November 2023, the Bedhampton site was visited at high tide, to determine if qualifying bird species were utilising the Site due to the presence of potentially suitable foraging habitat. No qualifying species were observed, with the Site used as an active pumping station and, therefore, subject to regular disturbance. This area is therefore deemed to be of low suitability to support foraging brent geese, with more suitable sites identified by the SWBGS on a similar latitude to the Site.
- 3.65. The playing fields within the working areas for Shafts 2 and 3 were also identified as potentially suitable to support brent geese, due to their proximity to site H11, and the presence of short-sward grassland. They were visited during high tide, at midday, during the ecological walkover in January 2023 on two occasions. During both visits, no brent geese or other qualifying bird species of the Chichester and Langstone Harbour SPA were observed. The area is subject to high disturbance levels during the day from dog walkers, and from recreational activities in the evening. The disturbance to the playing field renders the grassland unsuitable as a food source, with much of the field comprising mud amongst modified grassland at the time of survey. As such, Shafts 2 and 3 are deemed as unsuitable for brent geese.
- 3.66. Riders Lane Stream possesses steep earth banks with substrate suitable for burrowing, slow-moving backwaters and overhanging branches between several of the work locations. The stream provides suitability for nesting and foraging habitat for kingfisher. A single kingfisher was observed along this section of the stream in March 2023, confirming the presence of this species. Further targeted kingfisher surveys were conducted between May to July 2023, with the results presented in ES volume 4⁹¹.
- 3.67. Throughout the Site, multiple disused bird nests were observed amongst hedgerows and parcels of scrub and woodland. The presence of various grasslands, watercourses, woodland, scrub and hedgerows provide ample food sources for a myriad of bird species. The grassland in Staunton Country Park at the northern end of the Site in Section 9 is suitable for skylark, a ground nesting species. The walkover survey was undertaken outside of the core nesting bird season. However, sparrowhawk, little egret, grey heron, buzzard, moorhen, kestrel, greater spotted woodpecker, green woodpecker and cormorant and common garden bird species were all recorded within the Site in January, February and March 2023.
- 3.68. Small parcels of habitat are present along the new pipeline route which could support wintering or passage bird species. However, all areas are subject to high levels of disturbance, with the Bedhampton site being an active pumping station in an urban setting and the remaining surface

⁸⁹ The 104 species of bird recorded within 1 km of the Site include: Avocet, Barn Owl, Bar-tailed Godwit, Bearded Tit, Black Redstart, black-headed gull, Black-necked Grebe, Black-tailed Godwit, Cetti's Warbler, Common Scoter, Crossbill, Cuckoo, Curlew, Dark-bellied Brent Goose, Ferruginous Duck, Fieldfare, Firecrest, Golden Plover, Goosander, Grasshopper Warbler, Great Black-backed Gull, Great Crested Grebe, Great Northern Diver, Green Sandpiper, Greenshank, Grey Heron, Grey Wagtail, Hen Harrier, Herring Gull, House Sparrow, Indet. Harrier, Kingfisher, Lapwing, Lesser Black-backed Gull, Lesser Redpoll, Linnet, Little Egret, Long-tailed Duck, Marsh Harrier, Marsh Tit, Mediterranean Gull, Merlin, Nightjar, Osprey, Oystercatcher, Pochard, Red Kite, Red-necked Grebe, Redstart, Red-throated Diver, Redwing, Rock Pipit, Sandwich Tern, Scaup, Short-eared Owl, Shoveler, Siskin, Skylark, Slavonian Grebe, Snipe, Song Thrush, Starling, Water Pipit, Wheatear, Whimbrel, Whinchat, White Stork, Wood Sandpiper, Woodcock, Yellowhammer.

⁹⁰ Hampshire and Isle of Wight Wildlife Trust (2020). Solent Waders and Brent Goose Strategy

⁹¹ AtkinsRéalis (2023). Environmental Statement Volume 4: Appendix A9.20: Kingfisher survey report.

work locations all being publicly accessible land frequently used by dog walkers in a highly urban area.

Widespread Species of Reptile

- 3.69. HBIC provided eight recent reptile records within 1 km of the Site. All records returned pertain to widespread species of reptile and comprise the following:
- 3 records of slow-worm;
 - 2 records of common lizard;
 - 1 record of adder; and
 - 2 records of grass snake.
- 3.70. All records are located to the northeast of Staunton Country Park. The closest record was a common lizard approximately 30 m west of Shaft 8.
- 3.71. Table 3-9 provides a summary of habitats assessed as providing suitability for widespread species of reptile within the Site. The habitat areas are shown on Figure 9.15 Reptile habitat suitability assessment in ES Volume 3. The reference identification (for example R1) refers to a specific feature or area of habitat identified during the survey that poses suitability for widespread species of reptile. Each reference is independent and can be used to locate the point on Figure 9.15.

Table 3-9 – Habitat suitability for widespread species of reptile within the Site (surface work locations only)

Location	Ref.	OSNGR	Suitability	Description
Bedhampton Site/Shaft 1	R1	SU 70687 06475	Poor	Hardstanding within construction compound, bordered by scrub, hedgerow, scattered trees, railway, grassland and spoil. The hardstanding provides commuting and limited basking opportunities for widespread species of reptile, whilst grassland, railway (pylons), scrub and hedgerow provide suitability for foraging and commuting widespread species of reptile. The spoil heap provides hibernation potential. The area however is subject to high disturbance and will likely get too hot to support activity in the warmer months.
	R2	SU 70782 06368	Sub-optimal	Grassland with scattered tree/scrub border. Suitability for foraging, basking and hibernation. A slow worm receptor site used previously for a separate scheme is located to the east of this site and is assumed to have been constructed to support hibernating slow worms (TN4)
	R3	SU 70508 06370, SU 70552 06362	Sub-optimal	Deadwood piles from vegetation clearance and construction debris providing potential hibernaculum.
	R4	SU 70532 06321, SU 70591 06284	Sub-optimal	Butterfly bush and bramble scrub has dominated a number of large spoil heaps throughout the working area. The butterfly bush is open and will provide basking opportunity whilst the dense scrub and spoil is suitable for sheltering and hibernating reptiles.
	R5	SU70380625	Optimal	The rough grassland to the south of this site provides optimal reptile suitability for foraging and commuting (TN34). The grassland is connected to a stream which provides suitability for foraging and commuting grass snake. Parcels of dense vegetation also provide suitability for hibernation, with the grassland not regularly inundated from the adjacent stream.
Shafts 2 and 3	R5	SU 70762 07042	Poor	Short grassland under regular management and subject to high disturbance. However the site is allocated as a slow-worm translocation site, with a line of trees and scattered scrub bordering the site to the west which provides foraging potential.
Shaft 4	R6	SU 71104 07323	Sub-optimal	Grassland subject to regular management but surrounding habitat has greater suitability for foraging, commuting and hibernating reptile resulting in potential dispersal to shaft working area.

Location	Ref.	OSNGR	Suitability	Description
Emergency Discharge Chamber	R7	SU 70959 07581	Optimal	Dense scrub and woodland, with connectivity to other scrub/woodland parcels provide suitability for foraging, commuting and foraging reptile. The woodland/scrub margins provide suitability for basking.
	R8	SU 71007 07568	Poor	Short grassland subject to high disturbance and regular maintenance may provide commuting habitat for reptile due to optimal suitability of surrounding habitat.
	R9	SU 70903 07603	Sub-optimal	Wetland habitat associated with Hermitage Stream provides foraging/commuting suitability for reptile, specifically grass snake due to access to the watercourse.
Shaft 5	R10	SU 71173 07827	Optimal	Dense scrub provides foraging and hibernation suitability, particularly for grass snake due to access to the watercourse.
	R11	SU 71192 07796	Poor	Short grassland, subject to regular management is largely unsuitable for reptile, however, may support dispersal from adjacent more suitable habitat.
	R12	SU 71183 07762	Sub-optimal	Scattered trees along watercourse provide foraging/commuting opportunity but poor connectivity to adjacent more suitable habitat.
Shaft 6	R13	SU 71310 08178	Poor	Short grassland subject to high disturbance, intersected by hardstanding features of roads, footpaths and pavements. The scrub and tree line bordering residential properties provides suitability for foraging reptile particularly slow-worm.
Shaft 7	R14	SU 71612 08320	Optimal	Woodland and dense scrub provide suitability for foraging and commuting reptile. Fly tipping and deadwood piles provide opportunity for hibernation. The woodland clearings provide suitability for basking.
Shaft 8	R15	SU 71858 08683	Poor	Wet woodland provides suitability for foraging and commuting (and avoidance of livestock) but flooding prevents opportunity for hibernation.
	R16	SU 71828 08829	Sub-optimal	Grassland regularly grazed by livestock is suitable for commuting reptile due to presence of surrounding suitable habitat for foraging, commuting and hibernating. However, this depends on the grazing schedule, with a higher grazing frequency reducing the suitability.
	R17	SU 71806 08642	Optimal	Brush piles from vegetation clearance provide opportunity for hibernation. Scrub provides foraging suitability.
Shaft 8 /Section 9	R18	SU 71733 08833	Optimal	Scrub/woodland provides suitability for foraging, commuting and hibernating. The woodland margins provide suitability for basking.

Location	Ref.	OSNGR	Suitability	Description
Section 10	R19	SU 71160 09479	Poor	The baseline habitat within Section 10 comprises rough grassland and rush pasture, with isolated parcels of woodland. This habitat would provide optimal suitability for reptiles, but has since been cleared and replaced with bare ground and spoil heaps as a result of the construction works associated with the reservoir scheme. There is a reduction in habitat suitable for foraging and commuting, with no opportunity for hibernation other than spoil piles. Suitability is greater at the margins of woodland, such as the Section 9/ 10 interface, however, the remaining Section 10 appears to have poor suitability to support widespread reptile species.

- 3.72. In summary, the habitat is varied throughout the Site in its suitability to support widespread species of reptile. There are parcels of optimal habitat suitability within the Emergency Discharge Chamber and Shafts 5, 7, 8, and Section 9, all of which comprise dense scrub and woodland. The predominant habitat type throughout the Site, which provides suitability for widespread species of reptile, is grassland. The various grassland parcels are subject to varying levels of management and disturbance throughout the Site. Higher suitability grassland assessed as sub-optimal, comprises relatively undisturbed habitat, with connectivity to more suitable habitat such as dense scrub or woodland.

Amphibians

- 3.73. HBIC provided two recent records of common toad within 1 km of the Site, both of which are located approximately 298 m east of Section 10, within the Havant Thicket Reservoir site. No records, or granted EPS licences for great crested newt (GCN), were returned within 1 km of the Site.
- 3.74. The field survey undertaken in January 2023 identified five seasonal ponds and one permanent pond (the lake within SCP) with suitability to support GCN. Habitat Suitability Index (HSI) assessments were conducted for each pond, with the results presented in Table 3-10. The ponds were located within the Bedhampton site and Shaft 8 working area, as well as a pond just north of the Shaft 7 working area as shown in Figure 9.16 Great crested newt habitat suitability assessment in ES Volume 3.

Table 3-10 – HSI assessment results summary

Ref	OSNGR	Distance from Site	Pond Permanence	HSI Score	HSI Pond Suitability	Notes
Waterbody 1	SU 70637 06454	Within Bedhampton site/Shaft 1	Seasonal	0.46	Poor	Poor suitability (seasonal waterbody)
Waterbody 2	SU 71626 08333	25 m north of Shaft 7	Seasonal	0.39	Poor	Poor suitability (seasonal waterbody)
Waterbody 3	SU 71769 08991	83 m north of Section 9	Seasonal	0.38	Poor	Poor suitability (seasonal waterbody)
Waterbody 4	SU 71614 09029	41 m north of Section 9	Seasonal	0.39	Poor	Poor suitability (seasonal waterbody)
Waterbody 5	SU 71624 09038	54 m north of Section 9	Seasonal	0.39	Poor	Poor suitability (seasonal waterbody)
Waterbody 6	SU 71870 09139	257 m north of Section 9	Permanent	0.22	Poor	Poor suitability (permanent waterbody)

- 3.75. All ponds were surrounded by terrestrial habitat with suitability to support foraging and hibernating GCN, including dense scrub, grassland and woodland. There are no significant barriers to prevent dispersal of GCN to within the nearest working area. Brash piles and deadwood piles, resulting from vegetation clearance, were recorded within all surface work locations where seasonal waterbodies were identified (TN 1, TN 21, TN 23). These features provide potential hibernation and sheltering opportunity for amphibians, including GCN. Although the presence of GCN cannot be ruled out, none of the waterbodies surveyed were considered to be suitable for breeding GCN.

White-clawed Crayfish

- 3.76. HBIC returned no recent records of white-clawed crayfish within 1 km of the Site.
- 3.77. No field signs indicating the presence of WCC were identified during the initial walkover surveys undertaken between January to March 2023. Suitable habitat for WCC is limited throughout the Site

due to the reinforcement of the riverbanks (Bedhampton site and Shaft 4) and the absence of in-channel vegetation and suitable in-channel refuges across the majority of the Site, which prevent burrowing, foraging, sheltering and predator avoidance opportunities for WCC.

- 3.78. The field survey undertaken in October 2023 assessed the section of spring to the south of the Bedhampton site, which falls within the Site, for WCC. The presence of aquatic vegetation, cobbles and construction debris such as bricks provide opportunities for sheltering. Various invertebrates were observed within the watercourse, which provide foraging opportunities for WCC and indicate good water quality. The WCC survey area was subject to an eDNA survey and a manual search survey. No positive results were returned for WCC eDNA, signal crayfish, or crayfish plague and no WCC or signal crayfish, including moults or remains, were found during the presence/likely absence survey.

Priority Invertebrates

- 3.79. HBIC provided 157 recent records of notable invertebrates within 1 km of the Site, of which 81 comprise recent records of invertebrates listed under the UK BAP⁹². At least nineteen⁹³ of the recent UK BAP invertebrate records were recorded within Staunton County Park⁹⁴. The habitats present within the working area of Shaft 8 and Section 9 in Staunton Country Park are of higher distinctiveness and are not widespread throughout the remaining Site. However, the working area of Shaft 8 and Section 9 will encompass a small percentage of the habitats available to the local populations of priority invertebrates, if present, as their mobile nature should allow dispersal to the adjacent habitats within Staunton Country Park.
- 3.80. The grassland, hedgerows, scrub and waterbodies within the working areas of Bedhampton site to Shaft 7 (and the Emergency Discharge Chamber) provide suitability for common and widespread invertebrate species; rare or priority species are considered unlikely to be present.
- 3.81. The wooded habitats present across the Site (Shafts 1 to 8, the Emergency Discharge Chamber and Section 9) have the potential to support stag beetles.

Invasive Non-native Species

- 3.82. HBIC provided 74 recent invasive non-native species records within 1 km of the Site, comprising 68 plant records, four mammal records (all pertaining to grey squirrel), and two invertebrate records (a leaf miner and moth species).
- 3.83. The field surveys undertaken throughout 2023 identified two montbretia plants, New Zealand pygmyweed and extensive butterfly bush⁹⁵ coverage as set out in Table 3-11 and Figure 9.17 Invasive Plants in ES Volume 3. The presence of Himalayan balsam (one stand) and Japanese knotweed (five stands) was recorded by Portsmouth Water's ecologist at Shaft 1, with all six stands having been confirmed to have undergone treatment in previous years, resulting in no field signs being visible during the field surveys.
- 3.84. During the kingfisher habitat suitability survey undertaken in May 2023, Himalayan balsam seedlings were identified approximately 10 m east of the Emergency Discharge Chamber.

Table 3-11 - Invasive non-native species

Invasive non-native species	Extent of cover	Location	
		OSNGR	Description
Himalayan balsam	Approximate 100 m stretch	SU 705 062	One stand, southwest of the Bedhampton site along Hermitage Stream. Closest record approximately 20 m this area.

⁹² UK BAP invertebrate species recently recorded within 1 km of the Site include grey dagger, knot grass, bearded chestnut, ear moth, dusky brocade, garden tiger, mottled rustic, small heath, small square-spot, September thorn, rustic, rosy rustic, white admiral, stag beetle, grass rivulet, white-letter hairstreak, hedge rustic, feathered gothic, blood-vein, cinnabar and oak hook-tip.

⁹³ Thirty-three of the 81 recent UK BAP invertebrate records returned within 1 km of the Site possessed six-figure grid references. As such, it is not possible to accurately confirm where these records are located in relation to Staunton Country Park.

⁹⁴ UK BAP invertebrate species recently recorded within Staunton Country Park include small heath and white admiral.

⁹⁵ Butterfly bush is not listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), however, the species has been included due to its invasive growing nature.

Invasive non-native species	Extent of cover	Location	
		OSNGR	Description
	Approximately 10m stretch (only young seedlings seen meaning coverage could be more extensive)	SU 7096 0757	Emergency discharge chamber (seedlings observed May 2023).
Japanese knotweed	Approximate 100 m stretch	SU 704 063	Five stands, northwest, southeast, and central/within Bedhampton site along Hermitage Stream, along the Bedhampton station rail line and within this site. Closest record within this site.
Butterfly bush (TN 5)	Approximately 4,000 m ² (across multiple spoil heaps)	SU 704 063	One continuous stand within Bedhampton site.
New Zealand pygmyweed (TN36)	Approximately 1278 m ²	SU 7038 0619	One continuous stand within the watercourse in the Bedhampton site.
Montbretia (TN 35)	< 1 m ²	SU 71269 07183	Two individual plants within the lowland mixed deciduous woodland in Shaft 4.

4. Conclusion

- 4.1. This report sets out the ecological features that have the potential to be affected by the Pipeline Scheme. The key ecological constraints identified were Great Copse (SINC), Thicket Lawn (SINC) and High Lawn (SINC), wet woodland and lowland mixed deciduous woodland (priority habitat), priority plant species, badger, bats, otters, breeding and wintering/passage birds (including kingfisher), widespread species of reptiles, amphibians and hazel dormice. Invasive non-native plant species are also present.

Report Validity

- 4.2. In the event of scope or programme changes or if works do not commence within 12 months of the date of this report, then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance⁹⁶.

⁹⁶ CIEEM (2019). Advice Note on the Lifespan of Ecological Reports and Surveys

Appendices



Appendix A. Non-statutory designated sites

Table A-1 - SINC's within 2 km of the Site

Site reference	Site name
EH0252	Barton's Copse & The Slip
HV0134	Battins Copse
HV0041	Beech Wood East
HV0051	Bell's Copse
EH0178	Blendworth Common (North)
EH0178	Blendworth Common (North) candidate amendment
HV0053	Blendworth Common (South)
HV0042	Bushy Lease
HV0052	Cabbagefield Row
HV0040	Cherry Tree Row
HV0046	Dunsbury Hill - Area 1
HV0045	Dunsbury Hill - Areas 5 & 6
HV0136	Dunsbury Hill Grassland 2
HV0050	Dunsbury Hill Wood
HV0077	Great Copse, Havant
EH0221	Hammond's Lands Copse
EH0194	Havant Thicket
HV0056	Havant Thicket (South-West Corner)
EH0159	Hazelton Common
HV0135	Hazleton Wood
HV0081	High Lawn
HV0139	Hurst Wood, Havant
EH0208	Idsworth Common
HV0086	Lower Beacon Field
HV0030	Meadow Adjacent to Johnston's Copse
HV0048	Meadow by Bells Copse
HV0059	Middle Clearing
HV0039	Neville's Park Areas 2 & 3
HV0038	Neville's Park Areas 4-10
HV0037	Neville's Park East Wood
HV0033	Neville's Park West Wood
EH0242	Oaklands Meadows 1 & 2

Site reference	Site name
EH0247	Oaklands Woodland
HV0036	Outhurst/Inhurst/Beech Woods
EH0189	Pyle Farm Meadow South
EH0230	Rowlands Castle Golf Course
EH0294	Southleigh Forest
HV0116	Southleigh Forest (South)
EH0252	St Faith's Churchyard
HV0134	Stakes Coppice Remnant 4
HV0041	Stakes Coppice Remnant 5
HV0051	Stakes Coppice Remnant 6
EH0178	Stakes Coppice Remnant 7
EH0178	The Holt
HV0053	The Queen's Inclosure
HV0042	The Warren, Havant
HV0052	Thicket Bottom
HV0040	Thicket Bottom Woods & Lake
HV0046	Thicket Lawn
HV0045	Wakefords Copse, Havant
HV0136	Waterlooville Golf Course
HV0050	Waterlooville Golf Course (North)

Appendix B. Target Notes and Plant Species List

Table B-1 – Target notes

Target note	Description	Photograph
Bedhampton site/Shaft 1		
1	Deadwood piles from vegetation clearance and construction debris form potential reptile and/or amphibian hibernacula.	 

Target note	Description	Photograph
		
2	Seasonal flooding causing temporary standing water. Provides limitations to plant species identification. The seasonal waterbody provides suitability for breeding amphibians, including great crested newts. Refer to Table 3-10 for further information.	
3	Evidence of multiple rabbit holes throughout the Shaft 1 working area, including the grassland habitat as well as the butterfly bush-dominated spoil heaps.	

Target note	Description	Photograph
		
4	Information board describing the grassland area to the west of the working area (pictured) as a slow worm receptor site. Below is an artificial reptile hibernaculum assumed to have been constructed to support slow worm hibernation. However, the condition has deteriorated.	 

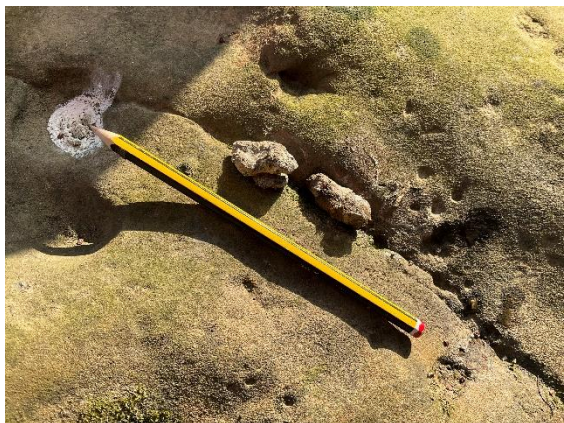
Target note	Description	Photograph
		
5	Extensive butterfly bush coverage throughout the working area, which forms the predominant scrub species amongst multiple spoil heaps.	
6	Both pictures depict an area of chalk stream to the south of the Bedhampton site working area, within Hermitage Stream. The water quality is optimal for WCC, whilst the rocks and in-channel debris provide refuge opportunity for WCC from predators. The waterway and earth banks also provide suitability for foraging and commuting otter, as well as rest sites.	 

Target note	Description	Photograph
32	Small-flowered buttercup. A priority plant species listed on the Hampshire Rare Plants Register.	
33	Wall bedstraw. A nationally scarce priority plant species, listed on the Hampshire Rare Plants Register.	
34	Rough grassland to the south of the Bedhampton site provides optimal habitat suitability for widespread species of reptile.	

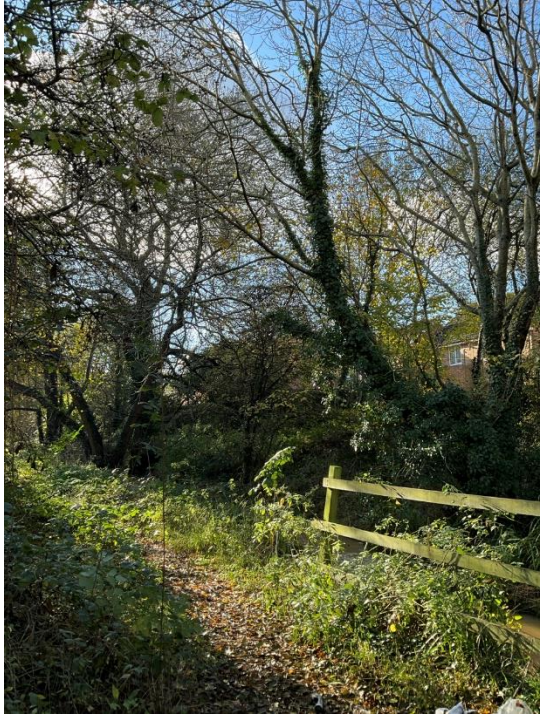
Target note	Description	Photograph
Shafts 2 and 3		
7	Modified grassland amongst highly disturbed and regularly managed playing fields. The Site is bordered by a line of trees and hedgerow. No watercourses are associated with this working area. A single fox hole was identified within the working area at this location, however, no fields signs indicating the presence of further protected or priority species was recorded here.	 
Shaft 4		
8	The reinforced riverbanks and riverbed of Hermitage Stream provide no substrate suitable for burrowing water voles. As such, the stream is unsuitable to support this species. It is also considered a transitory habitat for foraging and commuting otter due to lack of access to the bankside vegetation.	 

Target note	Description	Photograph
9	A remnant stream, potentially linked to an old mill, which feeds into Hermitage Stream. The stream has earth banks and marginal vegetation, which provides suitability for water vole. Dense bankside scrub and woodland may provide potential resting sites for otters.	
10	Short grassland subject to regular management. Example of sub-optimal to low suitability for widespread species of reptile, as described in Table 3-9.	
35	Two Montbretia plants within the lowland mixed deciduous woodland in Shaft 4. Montbretia is an INNPS.	

Target note	Description	Photograph
		
Emergency Discharge Chamber		
12	Dense scrub and lowland mixed deciduous woodland priority habitat provides optimal habitat suitability for commuting and foraging widespread species of reptile as described in Table 3-9.	
13	Aquatic marginal vegetation alongside Hermitage Stream. The exposed earth banks and in-channel and marginal vegetation provide habitat suitability for burrowing and foraging water vole. Wetland habitat may provide foraging/commuting opportunities for grass snake, with access to the watercourse. As described in Table 3-9.	

Target note	Description	Photograph
14	The steep earth banks along Riders Lane Stream provide suitability for kingfisher burrows. The slow backwater and overhanging branches provide ideal fishing opportunities for the species.	
15		
16		
Shaft 5		
17	Otter spraint on boulder within Riders Lane Stream, between shafts 5 and 6. Located at OSNGR SU 71261 08004.	

Target note	Description	Photograph
18	Opportunities for commuting widespread species of reptile, depending on grass length. Adjacent parcels of optimal habitat means grassland could provide suitable dispersal opportunities. Overall poor suitability as described in Table 3-9.	
Shaft 6		
19	Short grassland subject to high disturbance, intersected by hardstanding features of roads, footpaths and pavements. The scrub and tree line bordering residential properties provides suitability for foraging reptile particularly slow-worm. Overall poor suitability for reptile as described in Table 3-9.	
20	Dense scrub providing sub-optimal suitability for hazel dormouse. See section 3 for further description.	

Target note	Description	Photograph
	Wet woodland priority habitat to the west of Shaft 6, predominantly comprising willow and alder trees and a bramble scrub understorey.	
Shaft 7		
21	Example of optimal habitat suitability for widespread species of reptile as described in Table 3-9. Dense bramble scrub and woodland habitat provides suitability for foraging and commuting. Fly-tipping and deadwood provide suitable hibernation opportunities for reptile and amphibian. Woodland edges provide basking opportunities.	 

Target note	Description	Photograph
22	Seasonal waterbody at the base of an uprooted tree within Great Copse woodland. Located immediately north of the shaft's working area. The seasonal waterbody provides suitability for breeding amphibians, including great crested newts. High quality surrounding terrestrial habitat is also present.	
	Wet woodland priority habitat lines Riders Lane Stream through Shaft 7. Comprising alder and willow trees primarily, as well as a bramble scrub understory.	

Target note	Description	Photograph
Shaft 8		
23	Vegetation pile from previous clearance may serve as a reptile and/or amphibian hibernaculum.	
24	Outlier badger sett along an earth bank in an area of wet woodland. Spoil heap present with vegetation coverage (old), leaf litter and sticks in entrance. The sticks may have been laid intentionally as a form of monitoring. Sett entrance and tunnel head south.	

Target note	Description	Photograph
25	Large spoil heap. Leaf litter and sticks & twigs at sett entrance, no evidence of prints/hairs. The sticks may have been laid intentionally as a form of monitoring. Sett entrance and tunnel head southwest.	
26	Tunnel is similar width to sett entrance. Large amount of spoil present indicates badger creation. Lots of leaf litter in sett entrance, indicating no recent usage. Sett entrance facing north, tunnel heading south.	

Target note	Description	Photograph
27	Wet woodland to the south of the working area for Shaft 8. At the time of survey, a small ephemeral stream was present however, it is evident from previous botanical reports and the profile of the woodland that the area floods regularly. The stream feeds directly into Riders Lane Stream and, therefore, when high water levels are present, otters may forage upstream and rest within the woodland. The dense scrub provides suitability for foraging and commuting widespread species of reptile, whilst providing cover from grazing livestock within the same field. However, the influx of water from the ephemeral stream lowers the overall habitat suitability for widespread species of reptile as described in Table 3-9.	 

Section 9

28	Rough grassland grazed year-round by cattle/sheep. Sub-optimal for foraging, commuting and basking widespread species of reptile as described in Table 3-9.	
----	--	--

Target note	Description	Photograph
29	Brash piles from cleared woodland parcel. The habitat present provides optimal suitability for commuting and foraging widespread species of reptile and potentially hibernation opportunities as described in Table 3-9. The connecting grassland was rough and largely unmanaged at the time of the survey and is likely grazed.	
30	Seasonal waterbody present to the south of a livestock-grazed field, with hydrological links to an adjacent watercourse (during high water levels). The seasonal waterbody provides suitability for breeding amphibians, including great crested newts.	
31	One of two seasonal ponds present within the northern grazed field within the working area of Section 9. High quality terrestrial habitat is present within the immediate area. The seasonal waterbody provides suitability for breeding amphibians, including great crested newts.	

Target note	Description	Photograph
37	A parcel of lowland mixed deciduous woodland priority habitat to the north of Section 9. The woodland supports two mature oak trees with various potential roosting features for bats as well as nesting opportunities for birds.	

Table B-2 - Summary of habitats within the Site

The species list for each habitat type is a collation of all species found within these habitats across the Site. Abundance has therefore not been detailed, as this differed between each parcel of each habitat.

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
Other neutral grassland (g3c)	Alder
	Alexander's
	<i>Allium</i> sp.
	Bedstraw sp.
	Black medick
	Bracken
	Bramble
	Bristly oxtongue
	Bulbous buttercup
	Butterfly bush
	Caper spurge
	Cleavers
	Common chickweed
	Common knapweed
	Common mallow
	Common mouse-ear
	Common nettle
	Common ragwort
	Cow parsley
	Cranesbill sp.
	Creeping buttercup
	Creeping cinquefoil
	Creeping thistle
	Crocus sp.
	Daffodil sp.
	Daisy
	Dandelion
	Dock sp.
	Dove's-foot crane's-bill
	Field madder
	Fleabane
	Forget-me-not sp.
	Garlic mustard
	Great willowherb

⁹⁷ Stace (2019) New Flora of the British Isles 4th edition.

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	Greater burdock
	Ground ivy
	Hairy bitter-cress
	Herb robert
	Hairy plantain
	Ivy
	Lesser celandine
	Lords-and-ladies
	Malus sp.
	Meadow buttercup
	Meadowsweet
	Pedunculate oak
	Pendulous sedge
	Red dead nettle
	Ribwort plantain
	Scarlet pimpernel
	Self heal
	Small-flowered buttercup
	Small-flowered crane's-bill
	Spear thistle
	Speedwell sp.
	Spotted medick
	Teasel
	Violet sp.
	Wall bedstraw
	White clover
	Wood avens
	Wood spurge
	Yarrow
	Alexander's
Modified grassland (g4)	Ash
	Bramble
	Cock's-foot
	Common chickweed
	Common mallow
	Common mouse-ear
	Common nettle
	Common ragwort

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	Cow parsley
	Cranesbill sp.
	Creeping buttercup
	Daisy
	Dandelion
	Dock sp.
	Dove's-foot cranesbill
	<i>Allium</i> sp.
	Ground ivy
	Hawthorn
	Ivy
	Lesser celandine
	Lords-and-ladies
	Pedunculate oak
	Ribwort plantain
	Shepherd's purse
	Spear thistle
	White clover
	Wood avens
	Yarrow
	Common reed
Aquatic marginal vegetation (f2d)	Hemlock water dropwort
	Lesser celandine
	Pedunculate oak
	Willow sp.
	Alder
Dense scrub (h3)	Ash
	Bedstraw sp.
	Blackthorn
	Bluebell
	Bramble
	Butterfly bush
	Cleavers
	Cock's-foot
	Common nettle
	Common sow thistle
	Cow parsley
	Creeping buttercup

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	Creeping cinquefoil
	Dandelion
	Dock sp.
	Dogwood
	Dove's-tail crane's-bill
	Elder
	Great willowherb
	Hawthorn
	Hazel
	Hemlock water dropwort
	Ivy
	Lesser celandine
	Lords-and-ladies
	Maple sp.
	Pedunculate oak
	Pendulous sedge
	Red dead nettle
	Willow sp.
	Wood avens
	Yorkshire fog
Broadleaved, mixed and yew woodland (w1)	Alder
	Ash
	Bluebell
	Bramble
	Cleavers
	Cock's-foot
	Common hogweed
	Common nettle
	Cow parsley
	Creeping buttercup
	Creeping cinquefoil
	Dandelion
	Dock sp.
	Dove's-tail crane's-bill
	Elder
	Hart's-tongue fern
	Hawthorn
	Hazel

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	Holly
	Honeysuckle
	Hornbeam
	Ivy
	Lesser celandine
	Lime sp.
	Maple sp.
	Pendulous sedge
	Pedunculate oak
	Scot's pine
	Violet sp.
	Wood avens
	Birch sp.
Wet woodland (w1d)	Blackthorn
	Bramble
	Cleavers
	Common nettle
	Creeping buttercup
	Dock sp.
	Gorse
	Great willowherb
	Hawthorn
	Holly
	Lords-and-ladies
	Pedunculate oak
	Poplar sp.
	Spear thistle
	Stinking iris
	Willow sp.
	Acer sp.
Broadleaved, other woodland (w1g)	Alder
	Ash
	Bay laurel
	Blackthorn
	Bluebell
	Bramble
	Cherry laurel
	Cleavers

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	Common hogweed
	Common nettle
	Common ragwort
	Common reed
	Cow parsley
	Dandelion
	Dove's-tail crane's-bill
	Hawthorn
	Holly
	Honeysuckle
	Ivy
	Lesser celandine
	Lime sp.
	Lords-and-ladies
	Male fern sp.
	Malus sp.
	Pendulous sedge
	Pedunculate oak
	Poplar sp.
	Soft-shield fern
	Willow sp.
	Wood avens
	Veronica speedwell
	Yew
	Alder
Line of trees (w1g6)	Ash
	Birch sp.
	Bramble
	Butterfly bush
	Elder
	Gorse
	Hawthorn
	Ivy
	Juncus sp.
	Lime sp.
	London plane
	Maple sp.
	Pedunculate oak

UKHab Level 3, 4 or 5 habitat type	Plant species name (Stace ⁹⁷)
	<i>Prunus</i> sp.
	Sycamore
	Willow sp.
Lowland mixed deciduous woodland (w1f)	Alder
	Ash
	Bay laurel
	Blackthorn
	Bramble
	Common hawthorn
	Crack willow
	False brome
	Field onion
	Hazel
	Ivy
	Nettle
	Pedunculate oak
	Pendulous sedge
	Wayfaring tree
	Wood avens

Appendix B. Legislation Table

Table B-1 - Summary of legislation

Species	Legislation	Relevant offences	Licensing procedures and guidance
Bats European protected species	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43.	Deliberately ⁹⁸ capture, injure or kill a bat; deliberate disturbance ⁹⁹ of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	Mitigation licences issued for development by Natural England (NE). Guidance documents: <i>NE Standing Advice for protected species 2022</i> <i>European Protected Species: Mitigation Licensing - How to get a licence</i> (NE 2013) <i>Bat Mitigation Guidelines</i> (English Nature 2004) <i>Bat Workers Manual</i> (JNCC 2004)
	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take a bat; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ¹⁰⁰ a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Badgers	Protection of Badgers Act 1992.	Wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett.	Where required, licences for development activities involving disturbance or sett interference or closure are issued by NE. Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. Guidance documents:

⁹⁸ Deliberate capture or killing is taken to include “accepting the possibility” of such capture or killing.

⁹⁹ Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

¹⁰⁰ Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 (as amended) remain an offence under the Wildlife and Countryside Act 1981 (as amended) although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Species	Legislation	Relevant offences	Licensing procedures and guidance
		[It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied]	NE Standing Advice for protected species 2022 Badgers & Development (NE 2007)
Otters European protected species	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43.	Deliberately ⁹⁸ capture, injure or kill an otter; deliberate disturbance ⁹⁹ of otters; or damage or destroy a breeding site or resting place used by an otter.	Mitigation licences for development are issued by NE. Guidance documents: NE Standing Advice for protected species 2022 European Protected Species: Mitigation Licensing - How to get a licence (NE 2013)
	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take an otter; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ¹⁰⁰ an otter in such a place.	No licence is required for survey in England. However, a licence would be required if the survey methodology involved disturbance.
Hazel dormice European protected species	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43.	Deliberately ⁹⁸ capture, injure or kill a hazel dormouse; deliberate disturbance ⁹⁹ of a hazel dormouse; or damage or destroy a breeding site or resting place used by a hazel dormouse.	An NE licence in respect of development is required. Guidance documents: NE Standing Advice for protected species 2022 European Protected Species: Mitigation Licensing - How to get a licence (NE 2013) Dormouse Conservation Handbook (English Nature 2006)
	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take a hazel dormouse; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ¹⁰⁰ a hazel dormouse in such a place.	Licence issued for survey and conservation by NE.
Water voles	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take water voles; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ¹⁰⁰ a water vole in such a place.	A licence to displace water voles (CL31) can be obtained for projects that preserve public health and safety, prevent serious damage and/or are for reasons of overriding public interest. A mitigation licence (A11) to cover all Wildlife and Countryside Act 1981 (as amended) offences can be obtained for projects with reasons of overriding public interest, or projects which preserve public health and safety, prevent

Species	Legislation	Relevant offences	Licensing procedures and guidance
			serious damage to livestock, animal feed, crops, growing timber, fisheries or any other property and/or prevent spread of disease. Guidance documents: The Water Vole Conservation Handbook (R. Strachan & T. Moorhouse, Wildlife Conservation Research Unit, 3rd Edition 2011) Water voles and development licensing policy - NE Technical Information Note, TIN042, 2008 NE Standing Advice for protected species 2022 The Water Vole Mitigation Handbook (M. Dean, R. Strachan, D. Gow & R. Andrews 2016)
Birds	Wildlife and Countryside Act 1981 (as amended) Schedule 1 (some species only).	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover].	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes, e.g. public health, public safety, air safety. Guidance documents: NE Standing Advice for protected species 2022
Great crested newts European protected species	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43.	Deliberately capture, injure or kill a great crested newt; deliberate disturbance of a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt.	Licences issued for development by NE. Guidance documents: NE Standing Advice for protected species 2022 European Protected Species: Mitigation Licensing - How to get a licence (NE 2013) Great Crested Newt Mitigation Guidelines (English Nature 2001)

Species	Legislation	Relevant offences	Licensing procedures and guidance
	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take a great crested newt; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or disturb ¹⁰⁰ a great crested newt in such a place.	Licences issued for science (survey), education and conservation by Natural England.
Adders Common lizards Grass snakes Slow worms	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally kill, injure or take any widespread reptile species.	No licence is required ¹⁰¹ . However, an assessment for the potential of a site to support reptiles should be undertaken prior to any development works which have potential to affect these animals. Guidance documents: NE Standing Advice for protected species 2022
White-clawed crayfish	Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9.	Intentionally take from the wild.	Licences issued by NE for survey (to take crayfish by hand, by hand net or by crayfish trap). Use of crayfish traps for survey requires Environment Agency consent. Using crayfish traps to remove crayfish for maintenance or development activities in a watercourse requires a mitigation licence from NE and a permit from the Environment Agency. A mitigation licence can be obtained for projects with reasons of overriding public interest (A05a), or projects which preserve public health and safety, prevent serious damage to livestock, animal feed, crops, growing timber, fisheries or any other property and/or prevent spread of disease (A05). Guidance documents: NE Standing Advice for protected species 2022
Butterflies ¹⁰²	Wildlife and Countryside Act 1981 (as amended)	Intentionally kill, injure or take; intentionally or recklessly damage, destroy or obstruct access to any	A mitigation licence to cover all Wildlife and Countryside Act 1981 (as amended) offences to these invertebrate species (with the exception of large blue butterfly and Fisher's estuarine moth) can be obtained for projects with

¹⁰¹ Natural England will only consider licence applications to kill or injure reptiles in truly exceptional circumstances. Natural England will not be providing a definition or criteria of what constitutes 'exceptional circumstances' as these applications would need to be assessed on a case-by-case basis. Natural England expects developers and ecologists to continue to adhere to current best practice mitigation measures that avoid injuring and killing reptiles and which do not require a licence.

¹⁰² High brown fritillary, Large blue, Heath fritillary, Swallowtail.

Species	Legislation	Relevant offences	Licensing procedures and guidance
Moths ¹⁰³ Beetles ¹⁰⁴ Bugs ¹⁰⁵ Crickets ¹⁰⁶ Dragonflies 107 Spiders ¹⁰⁸	Schedule 5, Section 9.	structure or place used for shelter or protection or to disturb ¹⁰⁰ in such a place.	reasons of overriding public interest (A05a), or projects which preserve public health and safety, prevent serious damage to livestock, animal feed, crops, growing timber, fisheries or any other property and/or prevent spread of disease (A05).
Rabbits, foxes and other wild mammals	Wild Mammals (Protection) Act 1996.	Intentionally inflict unnecessary suffering to any wild mammal.	NE provides guidance in relation to rabbits, foxes (which are also protected under the Wildlife and Countryside Act 1981 (as amended) from live baits and decoys) and other wild mammals, on their website. Lawful and humane pest control of these species is permitted.
Plants European protected species	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 47.	Deliberately pick, collect, cut, uproot or destroy a wild plant of a European protected species (Schedule 5).	Licences can be issued for science, education and conservation and also in respect of a development if it is of over-riding public interest. Guidance documents: NE Standing Advice for protected species 2022 European Protected Species: Mitigation Licensing - How to get a licence (WML-G12) (NE 2013) Guidance on sampling rare aquatic plants, NE 2009
Plants Nationally protected species	Wildlife and Countryside Act 1981 (as amended) Schedule 8, Section 13.	Intentionally pick, uproot or destroy any wild plant on Schedule 8.	A mitigation licence to cover all Wildlife and Countryside Act 1981 (as amended) offences can be obtained for projects with reasons of overriding public interest (A05a), or projects which preserve public health and safety, prevent serious damage to livestock, animal feed, crops, growing timber, fisheries or any other property and/or prevent spread of disease (A05). No licence is required for survey in England. Guidance on survey techniques is available from Natural England. Guidance documents: NE Standing Advice for protected species 2022

¹⁰³ Reddish buff, Fiery clearwing, Fisher's estuarine moth, Barberry carpet, Black-veined, Sussex emerald, Essex emerald, New Forest burnet.

¹⁰⁴ Rainbow leaf beetle, Water beetle Graphoderus zonatus, Water beetle Paracymus aeneus, Lesser silver water beetle Hypebaeus flavipes, Violet click beetle.

¹⁰⁵ New Forest cicada.

¹⁰⁶ Wart biter, Mole cricket Gryllotalpa Gryllotalpa, Field cricket Gryllus campestris.

¹⁰⁷ Norfolk aeshna, Southern damselfly.

¹⁰⁸ Fern raft spider, Ladybird spider.

Species	Legislation	Relevant offences	Licensing procedures and guidance
Plants Invasive species, e.g. Japanese knotweed, hybrid knotweed, giant knotweed, giant hogweed, rhododendron, Himalayan balsam	Wildlife and Countryside Act 1981 (as amended) Schedule 9, Section 14.	It is illegal to plant or otherwise cause these species to grow in the wild.	Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with Section 34 of the Environmental Protection Act 1990. Guidance documents: <i>How to stop invasive non-native plants from spreading</i> (Defra and Environment Agency 2022) <i>Guidance on section 14 of the Wildlife and Countryside Act</i> (Defra 2011)

Site Designation	Legislation	Protection	Guidance
Special Area of Conservation (SAC) Special Protection Area (SPA) Wetland of International Importance (Ramsar site)	Conservation of Habitats and Species Regulations 2017 (as amended) Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the Ramsar Convention).	Assessment of the implications of plans and projects is effected through Part 6 of the Conservation of Habitats and Species Regulations 2017 (as amended), in particular Regs 61 – 69. The legislation for the Sites of Special Scientific Interest which underpin each designation also applies.	Formal Appropriate Assessment is required to be undertaken by the competent authority before undertaking, or giving consent, permission or other authorisation for a plan or project which is likely to have a significant effect on such a site. Guidance documents: The National Planning Policy Framework (Department for Communities and Local Government, July 2021), with particular reference to Policy 15 Conserving and enhancing the natural environment. The Government Circular: Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning System (ODPM Circular 6/2005 & Defra Circular 01/2005) (the joint Circular). The Habitats Regulations Assessment Handbook, DTA Publications Ltd.

Site Designation	Legislation	Protection	Guidance
		These sites are given protection through policies in the Local Development Plan.	
Site of Special Scientific Interest (SSSI)	Wildlife and Countryside Act 1981 (as amended)	It is an offence to carry out or permit to be carried out any potentially damaging operation. SSSIs are given protection through policies in the Local Development Plan.	Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under Section 28 before undertaking operations likely to damage a SSSI. Section 28G places a duty on all public bodies to further the conservation and enhancement of SSSIs. Guidance documents: The National Planning Policy Framework (Department for Communities and Local Government, July 2021), with particular reference to Policy 15, and the joint Circular.
Local Nature Reserve (LNR)	National Parks and Access to the Countryside Act 1949 Section 21	LNRs are given protection through policies in the Local Development Plan.	LNRs are generally owned and managed by local authorities. Development proposals that would potentially affect a LNR would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The National Planning Policy Framework (Department for Communities and Local Government, July 2021), with particular reference to Policy 15, and the joint Circular.
Local Sites (e.g. County Wildlife Sites, Sites of Importance for Nature Conservation)	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The National Planning Policy Framework (Department for Communities and Local Government, July 2021), with particular reference to Policy 15, and the joint Circular.
Habitats & Species	Legislation	Guidance	
Species and Habitats of	Natural Environment &	Section 40 of the NERC Act 2006 (as amended) sets out the duty for public authorities to conserve biodiversity in England.	

Habitats & Species	Legislation	Guidance
Principal Importance for the Conservation of Biodiversity 'priority habitats and species'	Rural Communities Act 2006 Section 40 (as amended)	Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in Section 41 of the NERC Act (as amended) for England. The list of habitats and species can be found on the NE website under 'Habitats and species of principal importance in England'. The list is used as a guide for decision makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006 (as amended) to have regard to the conservation of biodiversity in England when carrying out their normal functions. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species. N.B. The UK Biodiversity Action Plan (BAP) was used to draw up the list of Species and Habitats of Principal Importance and was succeeded by the UK Post-2010 Biodiversity Framework in 2012. However, the UK BAP list of priority habitats and species continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework (JNCC & Defra, July 2012).
Hedgerows	The Hedgerows Regulations 1997	Under the regulations, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

Appendix C. National and Local Planning Policy

National Planning Policy Framework, updated 19 December 2023

- 4.1. The National Planning Policy Framework (NPPF) sets out the Governments planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF). The revised National Planning Policy Framework was published in July 2021.
- 4.2. Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions.
- 4.3. The paragraphs within Chapter 15 are relevant to the Pipeline Scheme, the key information from which is detailed below:
- 4.4. Para 174: Planning policies and decisions should contribute to and enhance the natural and local environment by:
 - a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
 - d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
 - f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.
- 4.5. Para 175: Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework¹⁰⁹; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
- 4.6. Para 176: Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads¹¹⁰. The scale and extent of development within these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

¹⁰⁹ Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a high quality.

¹¹⁰ English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

4.7. Para 177: When considering applications for development within National Parks, the Broads and Areas of Outstanding Natural Beauty, permission should be refused for major development¹¹¹ other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

- a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
- c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

4.8. Para 178: Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 176), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate unless it is compatible with its special character.

Habitats and biodiversity

4.9. Para 179: To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity¹¹²; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation¹¹³; and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

4.10. Para 180: When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons¹¹⁴ and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure

¹¹¹ For the purposes of paragraphs 176 and 177, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.

¹¹² Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

¹¹³ Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.

¹¹⁴ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

- 4.11. Para 181: The following should be given the same protection as habitats sites:
- a) potential Special Protection Areas and possible Special Areas of Conservation;
 - b) listed or proposed Ramsar sites¹¹⁵; and
 - c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.
- 4.12. Para 182: The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

¹¹⁵ Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

AtkinsRéalis
Woodcote Grove
Ashley Road
Epsom
KT18 5BW

© AtkinsRéalis except where stated otherwise