removal would be carried out under the supervision of a suitably qualified ecologist and should commence with the careful removal of naturally occurring refugia, such as brash and log piles, by hand followed by the removal of scrub, and then successive lowering of herbaceous vegetation to a height of 75mm. Trapping of reptiles should continue whilst this takes place. Once vegetation has been removed to approximately 75mm, this height would be maintained to keep the habitat unsuitable for reptiles.

- Once all necessary vegetation has been reduced to 75mm and at least 5 successive trapping days have occurred without any reptiles being captured, a destructive search of former areas of reptile habitat would be undertaken. Where appropriate, this would involve the careful stripping of topsoil under the supervision of a suitably qualified ecologist during conditions where reptiles are likely to be active. Topsoil would be stored away from the perimeter fencing and any areas of retained reptile habitat to reduce the likelihood of it forming suitable reptile refugia. All vegetation would be cleared and removed from the fenced area. Removed vegetation may be used in enhancement works for the receptor area.
- In the event that the destructive search is delayed, the vegetation would be maintained at ground level until the destructive search is carried out. Similarly, following the destructive search, the land would be maintained as unsuitable for the recolonisation of reptiles prior to and throughout the proposed works and the perimeter fencing maintained until all works potentially affecting reptiles have been completed.

Other works

5.5.2 Where certain works which affect only small areas of suitable reptile habitat are proposed within a development phase subject to a wider translocation exercise (e.g. provision of services), due to the low risk of reptiles being encountered it may be appropriate for such works to be carried out in accordance with a precautionary approach to clearance as opposed to full translocation in order to ensure that reasonable measures to avoid contravention of legislation protecting common and widespread reptile species (i.e. protection against injury and killing) are employed. This would follow the habitat manipulation methodology detailed in *Section 5.4* above. This would need to be assessed on a case by case basis at an appropriate stage and documented in the Detailed Reptile Mitigation Strategy for that development phase.

6 ONGOING MAINTENANCE

6.1 The ongoing maintenance of the SANG and other areas of public open space is detailed within the *Outline Site-Wide Landscape and Ecological Management Plan* (HDA, 2018b) to ensure the integrity of the newly created and enhanced areas of habitat for reptiles will be

maintained in the long-term. Detailed LEMPs will also be prepared for each development phase to reflect detailed design in any given area.

7 CONCLUSION

7.1 Through implementation of the mitigation measures outlined above the development would avoid injury or killing of any reptiles present.

7.2 Although the loss of reptile habitat as a result of the outline development proposals is unlikely to be significant within a local context, measures for the creation and enhancement of new areas of reptile habitat within the site are included as part of the informal open space proposals for the wider site. These include the creation of a 29ha SANG, dominated by suitable reptile habitat, within an area of the wider site currently of limited value for this group. Through the implementation of these measures, it would be expected that current reptile interest of the site could be maintained and increased.

7.3 It is therefore concluded that subject to employment of the approach outlined above, the development would protect individual reptiles currently occurring within the site and ensure that the favourable conservation status of the local reptile population is maintained.

8 REFERENCES

Beebee T. and Griffiths R. (2000). *Amphibians and Reptiles.* HarperCollins Publishers Ltd, London.

Froglife. (1999). *Reptile survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.

Froglife (2016). *Surveying for reptiles. Tips, Techniques and Skills to help you survey for reptiles*. Froglife, Halesworth.

HDA (2018a). *Hogwood Farm, Finchampstead: Reptile Survey Report and Site-wide Outline Reptile Mitigation Strategy*. Hankinson Duckett Associates, Wallingford.

HDA (2018b) *Hogwood Farm, Finchampstead: Outline Site-wide Landscape and Ecological Management Plan.* Hankinson Duckett Associates, Wallingford.

HDA (2018c) *Hogwood Farm, Finchampstead: Outline Site-wide Ecological Permeability Scheme.* Hankinson Duckett Associates, Wallingford.

HDA (2021) Hogwood Farm, Finchampstead *Reptile Survey Report and Site-wide Outline Reptile Mitigation Strategy*. Hankinson Duckett Associates, Wallingford.

HDA (2024) *Hogwood Farm, Finchampstead: Phase 1 Habitat Survey and Target Notes.* Hankinson Duckett Associates, Wallingford.

Joint Nature Conservation Committee (Gent, T & Gibson, S. Eds) (1998). *The Herpetofauna Worker's Manual.* JNCC, Peterborough.

Joint Nature Conservancy Committee. (1989). *Guidelines for Selection of Biological SSSIs.* JNCC, Peterborough.

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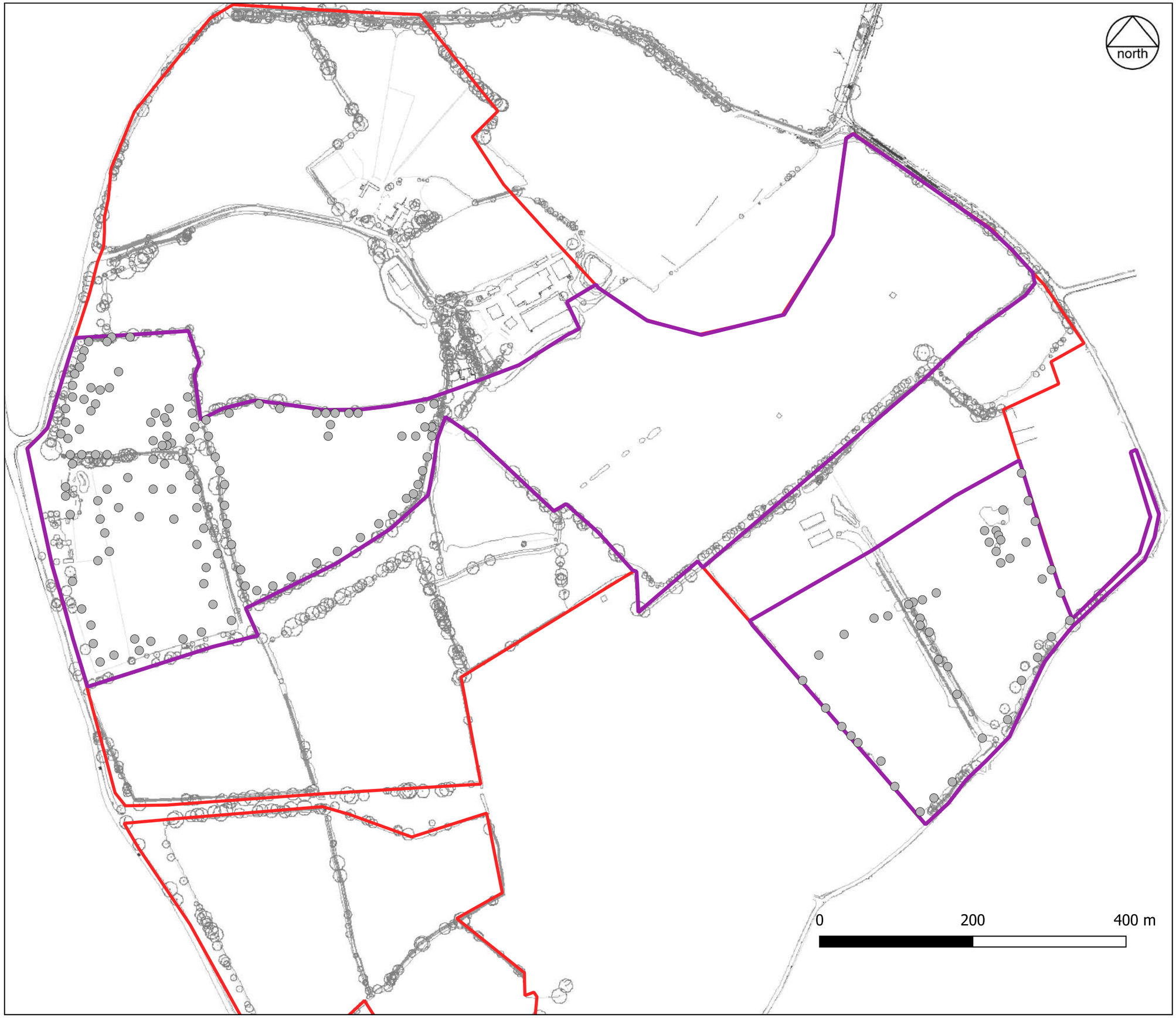
	Personnel	Position
Author	Robert Goldsmith	Assistant Ecologist
Approved for issue	Clare Bird MCIEEM	Associate Ecologist

APPENDIX A

2023 Reptile Survey Summary Plan



KEY

- Wider site boundary
- Site Boundary
- Reptile refugia location*

*No reptiles recorded

CLIENT:
CALA Homes Thames Ltd.

PROJECT:
Hogwood Farm, Finchampstead

TITLE:
2023 Reptile Survey Summary Plan

SCALE AT A3:
1:7,500

DATE:
May 2024

868.1/80

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Landscape Architecture
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Ecology

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APPENDIX F

2023 Great Crested Newt HSI and eDNA Survey Report

Landscape Architecture
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HOGWOOD FARM, FINCHAMPSTEAD

2023 GREAT CRESTED NEWT HSI AND eDNA SURVEY REPORT

Prepared for CALA Homes Thames Ltd

by

Hankinson Duckett Associates

HDA ref: 868.1

May 2024

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CONTENTS **Page**

APPENDICES

1 INTRODUCTION

1.1 Site location and summary description

1.1.1 This report describes a updated Habitat Suitability Index (HSI) assessment and eDNA sampling survey of waterbodies located in the vicinity of the proposed Parcels 4, 5, 6, 10, 11, 12, 13 and Neighbourhood Centre located within approximately 110ha of land at Hogwood Farm, Finchampstead hereinafter referred to as 'the site'. The centre of the site is located by National Grid Reference SU 76969 64399. The study was commissioned by CALA Homes (Thames) Ltd in May 2023.

1.1.2 The site is located to the north-west of the village of Finchampstead, Berkshire. In general terms, the western area of the site is comprised of three fields of disturbed ground dominated by short ruderal vegetation with scattered areas of tall ruderal vegetation and large spoil heaps bordered by mature trees and woodland with scrub field margins. The central and eastern areas of the site are comprised of areas of hardstanding and construction/disturbed ground bordered by mature treelines and woodland. The south-eastern areas of the site comprise two fields of semi-improved grassland fields intersected by a ditch with associated scrub and scattered trees. A species-rich hedgerow with trees adjacent to Park Lane is present along the southern boundary. Woodland shaws and copses are located in the northern, western and central areas of the site, including mixed, broadleaved and broadleaved plantation woodland types, some of which are included on Natural England's Inventory of Ancient Woodland. Wetland habitats within the site include drainage ditches and small streams associated with the field boundaries and several ponds in poor condition are located across the site. Further information on the extent and composition of habitats across the site is provided in the Phase 1 Habitat Survey and Target Notes (HDA, 2024).

1.1.3 The site is part of a larger area covering a total of 110ha, hereinafter referred to as the 'wider site'. The wider site comprises residential dwellings associated with Parcels 1 and 2 in the north-west, construction sites associated with Parcels 14 and 15 in the east and the Nine Mile Ride Extension (NMRE) and the SANG which comprises a mix of wetland, grassland, scrub and woodland habitats which is located in the south of the wider site.

1.1.4 The site and wider site are bordered to the north by residential dwellings, the Bohunt School and the Hogwood Industrial Estate; to the east by Park Lane beyond which lie residential dwellings and park homes; to the south by Park Lane and farmland; and to the west by A327 Reading Road and Sheerlands Road beyond which lie farmland and woodland. The wider area is dominated by agricultural land interspersed with woodland and residential properties. The location and boundary of the site are shown in *Appendix A*.

1.2 Background and legislative context

1.2.1 Five species of amphibian are widespread in England: Common Frog *Rana temporaria*, Common Toad *Bufo bufo*; Smooth Newt *Lissotriton vulgaris*; Palmate Newt *Lissotriton helveticus;* and Great Crested Newt *Triturus cristatus*. A sixth species of amphibian, the Natterjack Toad *Bufo calamita,* also occurs in England but this species has special habitat requirements that limit its range to certain sand dune and heathland sites.

1.2.2 Amphibians require aquatic habitat within which to breed and suitable terrestrial habitat to forage and hibernate. Suitable breeding ponds are usually well vegetated with still, shallow water that is not heavily shaded or very exposed. Terrestrial habitat includes woodland, scrub, field edges and gardens. Hibernation can occur under stone or log piles, in crevices or leaf litter and under the soil. Occasionally amphibians may be found hibernating in their breeding pools.

1.2.3 Over the last few decades all amphibians have suffered a decline in numbers. This is due to a combination of many factors, which include habitat destruction and fragmentation, loss of breeding pools through unsympathetic management and neglect, introduction of fish (which eat amphibian larvae) and pollution.

1.2.4 The Great Crested Newt is protected as a European Protected Species (EPS) under the 2017 Conservation of Habitats and Species Regulations (as amended). In relation to European Protected Species, the 2017 Regulations make it an offence to:

- Deliberately capture, injure or kill any wild animal of an EPS;
- Deliberately disturb wild animals of any such species, in particular any disturbance which is likely to: (i) impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or to hibernate or migrate; (ii) affect significantly the local distribution or abundance of the species to which they belong;
- Damage or destroy a breeding site or resting place of such an animal; and/or
- To (a) be in possession of, or to control; (b) to transport any live or dead animal or any part of an animal; (c) to sell or exchange or (d) offer for sale or exchange any live or dead animal or part of an animal of an EPS.

1.2.5 In addition, Great Crested Newts are protected under the 1981 Wildlife and Countryside Act (as amended). The Great Crested Newt is listed on Schedule 5 of the Act and is subject to the provisions of Sections 9.4b and 9.4c, which make it an offence to:

- Intentionally or recklessly disturb a Great Crested Newt while it is occupying a structure or place which it uses for shelter or protection; and/or
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a Great Crested Newt.

1.2.6 Great Crested Newts and Common Toads are also identified as a Species of Principal Importance under Section 41 of the 2006 Natural Environment and Rural Communities (NERC) Act. Section 40 of the Act requires that these species are a material consideration in the planning process.

1.3 Development proposals

1.3.1 Planning permission (O/2014/2179 and 140764) was granted in January 2017 for a hybrid application. This comprises:

- Outline permission for demolition of all existing buildings on site; up to 1,500 new dwellings; employment floor space; a Neighbourhood Centre; a primary school; sports pitches and associated pavilion building; highways infrastructure; associated landscaping, public realm, open/green space and sustainable urban drainage systems; and
- Full permission for a 29.7ha Suitable Alternative Natural Greenspace (SANG) in the south of the site.

The hybrid planning permission was subsequently amended by a Section 73 application (181194) which was approved in November 2018.

1.4 Scope and purpose of the report

1.4.1 An eDNA Great Crested Newt survey of the site and wider site was carried out in April 2018 which recorded a likely absence of Great Crested Newts within the site (HDA, 2018).

1.4.2 Great Crested Newts typically have a maximum routine migratory range of 250m away from breeding ponds during terrestrial phases (Cresswell and Whitworth, 2004) and a review of the OS 1:10,000 scale map and aerial photographs suggest that there are waterbodies located within 300m of the site boundary which may provide breeding habitat for Great Crested Newts.

1.4.3 There are no waterbodies within the site which could provide suitable breeding habitat for Great Crested Newts and this species is therefore not expected to breed at the site. Habitats within the site including grassland, tall ruderals, scrub and woodland provide suitable terrestrial habitat for Great Crested Newts. A review of the OS 1:10,000 scale map and aerial photographs of the site's surrounds suggests that there are waterbodies located within 300m of the site (including ponds within wider site), the closest of which is located approximately 10m to the south of the site boundary.

1.4.4 In view of the above it was considered possible that Great Crested Newts could use the site during terrestrial phases and a series of updated Great Crested Newt surveys including a Habitat Suitability Index (HSI) assessment and Great Crested Newt presence/absence eDNA survey were subsequently undertaken in order to:

i. To establish the suitability of waterbodies within the vicinity of the site for Great Crested Newts;
ii. To establish the likely presence/absence of Great Crested Newts breeding in suitable waterbodies within the vicinity of the site;
iii. To determine requirements for any further survey work to estimate the size of any Great Crested Newt population potentially associated with the site; and
iv. To predict likely impacts of the proposed development on Great Crested Newts and give recommendations for impact avoidance, minimisation and/or mitigation.

2 METHODOLOGY

2.1 Great Crested Newt Habitat Suitability Index (HSI) Assessment

2.1.1 Habitat Suitability Index (HSI) assessments provide a mechanism by which the suitability of a pond to support Great Crested Newts can be objectively assessed in order to assist in the identification of ponds potentially supporting this species (Oldham *et al*., 2000).

2.1.2 For the HSI assessment the locations of waterbodies within approximately 300m of the site were identified from online aerial photographs, a 1:10,000 scale Ordnance Survey map and from other waterbodies encountered during the field survey. Where necessary, relevant landowners were contacted in advance of the survey in order to gain access to off-site waterbodies. Use of a 300m radius reflects the findings of studies into the movement of Great Crested Newts during terrestrial phases which indicates that the maximum routine migratory distance of Great Crested Newts away from breeding ponds during terrestrial phases is less than 250m (Cresswell and Whitworth, 2004).

2.1.3 The HSI assessment was conducted by Robert Goldsmith and Anna Potter of HDA on the 14th and 29th June 2023. All accessible waterbodies identified within the survey area were visited and, where appropriate, assessed against each of the following ten suitability indices:

i. Geographic location;
ii. Pond area;
iii. Pond permanence;
iv. Water quality;
v. Shading;
vi. Presence of waterfowl;
vii. Presence of fish;
viii. Pond density in the area;
ix. Terrestrial habitat quality; and
x. Macrophyte cover in pond.

2.1.4 Details of the pond characteristics (depth, margin profile, etc.) and bankside, marginal and aquatic vegetation were also recorded during the assessment.

2.2 Great Crested Newt Environmental DNA (eDNA) Survey

2.2.1 Great Crested Newt eDNA sampling surveys were conducted on all accessible waterbodies that had been identified as having suitability to support Great Crested Newts during the HSI survey. The eDNA survey methodology is recognised by Natural England as a reliable technique for determining the presence/likely absence of Great Crested Newts within a pond through detection of traces of Great Crested Newt DNA within the water.

2.2.2 The eDNA sampling survey was conducted by Robert Goldsmith and Anna Potter on the 14th and 29th June 2023. The field survey involved taking samples of pond water at each of the surveyed waterbodies in line with the recognised methodology established by Biggs *et. al.* (2014). The samples were then despatched to a recognised laboratory for polymerase chain reaction (qPCR) analysis.

3 RESULTS

3.1 No waterbodies are located within the site and 16 waterbodies with potential to support Great Crested Newts were identified within the wider survey area during the desk study and a further waterbody was identified during the survey visit. The locations of the waterbodies are shown in *Appendix A* and photographs are provided in *Appendix D*.

3.2 The results of the HSI assessment and eDNA survey, together with descriptions of the surveyed waterbodies and any limitations encountered, are provided below. Full findings of the HSI assessment and the laboratory results from the eDNA analysis are provided in *Appendices B* and *C* respectively.

3.3 Waterbody 1

Location: Approximately 140m to the north-west of the site.

HSI assessment: 0.792

3.3.1 Waterbody 1 (*Photo 1*) comprises a medium-sized pond within a residential garden. The waterbody has a lined base with earth on top. Aquatic and emergent vegetation is present within the pond. The pond is partially shaded by the trees and shrub present along the southern and western margins. Immediately surrounding terrestrial habitat includes amenity grassland, scrub, wooded areas, buildings and paved areas/bare ground. The water quality was assessed as good and it is assumed the waterbody never dries. No waterfowl were recorded at the time of survey but it is possible that a small number of waterfowl use the pond on occasion. No fish were observed during the survey, however it is possible that fish are present within the waterbody.

3.3.2 The HSI for Waterbody 1 was calculated as 0.792, which indicates that the pond has ‘good’ suitability for Great Crested Newts.

3.3.3 An eDNA sampling survey of Waterbody 1 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.3.4 No limitations were encountered during the survey of Waterbody 1.

3.4 Waterbody 2

Location: Approximately 200m to the north-west of the site.
HSI assessment: 0.760

3.4.1 Waterbody 2 (*Photo 2*) comprises a medium-sized pond within a residential garden. The waterbody has a lined base with earth on top. Aquatic and marginal plants including reeds and sedges were present around the margins of the pond and the pond surface was dominated by duckweed at the time of survey. Beyond the pond margins is amenity grassland to the south and west; a narrow, bare earth access track to the north; and a strip of scrub and trees to the east. Trees are present on the eastern margin of the pond, shading approximately 50% of the pond. The water quality was assessed as moderate and it is assumed the waterbody never dries. No waterfowl or fish were observed during the survey, however it is possible that fish are present within the waterbody.

3.4.2 The HSI for Waterbody 2 was calculated as 0.760, which indicates that the pond has ‘good’ suitability for Great Crested Newts.

3.4.3 An eDNA sampling survey of Waterbody 2 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.4.4 No limitations were encountered during the survey of Waterbody 2.

3.5 Waterbody 4

Location: Waterbody 4 located approximately 220m to the north of the site.

HSI assessment: 0.485

3.5.1 Waterbody 4 (*Photo 3*) comprises an artificial pond located within the northern area of the wider site. The pond has an area of approximately 450m², with an earth base and gently sloping earth banks which are mostly bare of vegetation. The water quality was assessed as bad, and it is anticipated that the pond only dries after long dry periods. No waterfowl or fish were observed during the survey. Trees border the pond margins creating approximately 90% shade. Moderate quality terrestrial habitat in the form of woodland, scrub and grassland habitats are located in close vicinity to the pond.

3.5.2 The HSI for Waterbody 4 was calculated as 0.485, which indicates that the pond has 'poor' suitability for Great Crested Newts.

3.5.3 An eDNA sampling survey of Waterbody 4 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.5.4 No limitations were encountered during the survey of Waterbody 4.

3.6 Waterbody 5

Location: Approximately 275m to the north of the site.

HSI assessment: 0.460

3.6.1 Waterbody 5 (*Photo 4*) comprises a large pond located within broadleaved woodland to the west of Hogwood Industrial Estate. The pond has an area of approximately 900m², with a mix of gently sloping and steep sided earth banks with limited aquatic and marginal plants present. The water quality was assessed as bad and it is assumed that the pond never dries. No waterfowl were recorded at the time of survey but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. Trees border the pond margins casting approximately 90% shade. Moderate quality terrestrial habitat in the form of woodland borders all sides.

3.6.2 The HSI for Waterbody 5 was calculated as 0.460, which indicates that the pond has 'poor' suitability for Great Crested Newts.

3.6.3 An eDNA sampling survey of Waterbody 5 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a

negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.6.4 No limitations were encountered during the survey of Waterbody 5.

3.7 Waterbody 10

Location: Approximately 230m to the north-east of the site.

HSI assessment: Unknown

3.7.1 Access to Waterbody 10 was not granted. Aerial photographs and a 1:10,000 scale Ordnance Survey map indicate the waterbody is large, approximately 3800m² in size, with a wooded island in its centre. The waterbody is located approximately 230m from the north-east of the site boundary at its closest point.

3.7.2 The waterbody appears to be surrounded by good quality terrestrial habitat in the form of deciduous woodland. The potential for Waterbody 10 to support Great Crested Newts is considered in the context of the findings of the wider survey in *Section 4* below.

3.8 Waterbody 11

Location: Approximately 20m to the east of the site.

HSI assessment: 0.271

3.8.1 Waterbody 11 (*Photo 5*) comprises a small lake located within Robinson Crusoe Park, approximately 20m to the east of the site. The lake is deep with both gently sloping and steep-sided earth banks. Scattered trees and scrub border the pond margins, shading approximately 10% of the lake. Aquatic and marginal plants are largely absent, with occasional sedges, rushes and Iris. The water quality was assessed as poor and it is assumed the waterbody never dries. Small numbers of waterfowl and fish were observed during the survey. Moderate quality terrestrial habitat in the form of woodland to the south and west and garden habitats border the pond.

3.8.2 The HSI for Waterbody 11 was calculated as 0.271, which indicates that the pond has 'poor' suitability for Great Crested Newts.

3.8.3 An eDNA sampling survey of Waterbody 11 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.8.4 No limitations were encountered during the survey of Waterbody 11.

3.9 Waterbody 15

Location: Approximately 35m to the north-east of the site.

HSI assessment: 0.411

3.9.1 Waterbody 15 (*Photo 6*) comprises a small man-made pond within a residential garden. The pond has steep vertical concrete sides and lined base. The land surrounding the pond comprises of paved hardstanding. Aquatic and emergent vegetation is present within the pond. Fish were recorded during the survey. The waterbody has poor water quality, and it is assumed the waterbody never dries.

3.9.2 The HSI for Waterbody 15 was calculated as 0.411, which indicates that the pond has 'poor' suitability for Great Crested Newts.

3.9.3 An eDNA sampling survey of Waterbody 15 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.9.4 No limitations were encountered during the survey of Waterbody 15.

3.10 Waterbody 15a

Location: Approximately 35m to the north-east of the site.

HSI assessment: 0.411

3.10.1 Waterbody 15a (*Photo 7*) comprises a small man-made pond within a residential garden, approximately 10m north-west of Waterbody 15. The pond has steep vertical concrete sides and lined base. The majority of the land surrounding the pond comprises of paved hardstanding areas, short amenity grassland and ornamental shrub planting. Aquatic vegetation is present within the pond and fish were recorded during the survey.

3.10.2 The HSI for Waterbody 15a was calculated as 0.411, which indicates that the pond has 'poor' suitability for Great Crested Newts.

3.10.3 The pond was not subject to an eDNA sampling survey due to a netting guard on the pond. The potential for Waterbody 15a to support Great Crested Newts is considered in the context of the findings of the wider survey in *Section 4* below.

3.11 Waterbody 18

Location: Approximately 10m to the south of the site.

HSI assessment: 0.854

3.11.1 Waterbody 18 (*Photo 8*) comprises a large man-made SuDS pond located within the newly established SANG within the wider site. The pond has an earth base with gently sloping earth banks. Aquatic and marginal plants including reeds, rushes and sedges were present around the margins and within the pond. Beyond the pond margins is meadow grassland boarded by mature trees. No waterfowl were recorded at the time of survey, but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. The waterbody has good water quality, and it is assumed the waterbody sometimes dries after long dry periods.

3.11.2 The HSI for Waterbody 18 was calculated as 0.854, which indicates that the pond has 'excellent' suitability for Great Crested Newts.

3.11.3 An eDNA sampling survey of Waterbody 18 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.11.4 No limitations were encountered during the survey of Waterbody 18.

3.12 Waterbody 20

Location: Approximately 75m to the south of the site.

HSI assessment: 0.923

3.12.1 Waterbody 20 (*Photo 9*) comprises the northern-most pond of a series of three SuDS ponds (Waterbodies 20, 21 and 22) that interconnect during periods of increased precipitation which are located in the newly established SANG within the wider site. The pond has an earth base with gently sloping earth banks. Aquatic and marginal plants including reeds, rushes and sedges were present around the margins and within the pond. Beyond the pond margins is meadow grassland bordered by mature trees. No waterfowl were recorded at the time of survey, but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. The waterbody has good water quality, and it is assumed the waterbody sometimes dries after long dry periods.

3.12.2 The HSI for Waterbody 20 was calculated as 0.923, which indicates that the pond has 'excellent' suitability for Great Crested Newts.

3.12.3 An eDNA sampling survey of Waterbody 20 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.12.4 No limitations were encountered during the survey of Waterbody 20.

3.13 Waterbody 21

Location: Approximately 150m to the south of the site.

HSI assessment: 0.831

3.13.1 Waterbody 21 (*Photo 10*) comprises the central pond of a series of three SuDS ponds (Waterbodies 20, 21 and 22) that interconnect during periods of increased precipitation which are located in the newly established SANG within the wider site. The pond has an earth base with gently sloping earth banks. Aquatic and marginal plants including reeds, rushes and sedges were present around the margins and within the pond. Beyond the pond margins is meadow grassland bordered by mature trees. No waterfowl were recorded at the time of survey, but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. The waterbody has good water quality, and it is assumed the waterbody sometimes dries after long dry periods.

3.13.2 The HSI for Waterbody 21 was calculated as 0.831, which indicates that the pond has 'excellent' suitability for Great Crested Newts.

3.13.3 An eDNA sampling survey of Waterbody 21 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.13.4 No limitations were encountered during the survey of Waterbody 21.

3.14 Waterbody 22

Location: Approximately 200m to the south of the site.

HSI assessment: 0.852

3.14.1 Waterbody 22 (*Photo 11*) comprises the southern-most pond of a series of three SuDS ponds (Waterbodies 20, 21 and 22) that interconnect during periods of increased precipitation which are located in the newly established SANG within the wider site. The

pond has an earth base with gently sloping earth banks. Aquatic and marginal plants including reeds, rushes and sedges were present around the margins and within the pond. Beyond the pond margins is meadow grassland bordered by mature trees. No waterfowl were recorded at the time of survey, but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. The waterbody has good water quality, and it is assumed the waterbody sometimes dries after long dry periods.

3.14.2 The HSI for Waterbody 22 was calculated as 0.852, which indicates that the pond has 'excellent' suitability for Great Crested Newts.

3.14.3 An eDNA sampling survey of Waterbody 22 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.14.4 No limitations were encountered during the survey of Waterbody 22.

3.15 Waterbody 23

Location: Approximately 120m to the south of the site.

HSI assessment: 0.858

3.15.1 Waterbody 23 (*Photo 12*) comprises a large SuDS pond located within the newly established SANG within the wider site, approximately 55m west of Waterbody 22. The pond has an earth base with gently sloping earth banks. Aquatic and marginal plants were present around the margins and within the pond. Beyond the pond margins is meadow grassland boarded by mature trees. No waterfowl were recorded at the time of survey, but it is possible that a small number of waterfowl use the pond on occasion although it is anticipated that their influence is minor. It is considered possible that fish could be present within the pond. The waterbody has good water quality, and it is assumed the waterbody sometimes dries after long dry periods.

3.15.2 The HSI for Waterbody 23 was calculated as 0.858, which indicates that the pond has 'excellent' suitability for Great Crested Newts.

3.15.3 An eDNA sampling survey of Waterbody 23 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.15.4 No limitations were encountered during the survey of Waterbody 23.

3.16 Waterbody 24

Location: Approximately 125m to the north of the site.

HSI assessment: 0.504

3.16.1 Waterbody 24 (*Photo 13*) comprises a large SuDS pond located in the north of the wider site. The pond has an earth base with gently sloping earth banks. Aquatic and marginal plants are largely absent, with occasional sedges and rushes. Beyond the pond margins is comprised of meadow grassland and areas of bare ground boarded by mature trees and scrub. Waterfowl were present at the time of survey, and it is considered possible that fish are present within the pond. The waterbody has moderate water quality, and it is assumed the waterbody never dries.

3.16.2 The HSI for Waterbody 24 was calculated as 0.504, which indicates that the pond has 'below average' suitability for Great Crested Newts.

3.16.3 An eDNA sampling survey of Waterbody 24 was subsequently carried out and the samples were sent to the Surescreen Scientifics laboratory for analysis. The analysis returned a negative result for Great Crested Newt eDNA which indicates that Great Crested Newts are highly likely to have been absent from the waterbody at the time of survey. The results of the eDNA analysis are provided in *Appendix C.*

3.16.4 No limitations were encountered during the survey of Waterbody 24.

3.17 Other waterbodies

3.17.1 A number of other waterbodies occur within the site and within a 300m radius of the site, in the form of dry ponds, ditches, drains and streams, all of which were identified as being unsuitable for breeding Great Crested Newts during the HSI survey due to either: (i) the absence of water (in the case of Waterbodies 3, 16 and 17); or (ii) the presence of flowing water which is unsuitable for breeding Great Crested Newts.

4 SUMMARY AND RECOMMENDATIONS

4.1 The eDNA survey results indicate that Great Crested Newts are highly likely to be absent. from all tested Waterbodies (Waterbodies 1, 2, 4, 5, 11, 15, 18, 20, 21, 22, 23 and 24) which are located within the wider site and surrounding area despite the suitability of some of these ponds for this species.

4.2 Two further waterbodies (Waterbodies 10 and 15a) identified within 300m of the site boundary, were not subject to HSI and/or an eDNA sampling surveys due to access

restrictions. Notwithstanding this, it is considered unlikely that Great Crested Newts are present within either of these waterbodies (and subsequently within the site) as:

- Great Crested Newts usually exist in metapopulations, using clusters of ponds with cross dispersal of individuals between them. This decreases the vulnerability of local populations to habitat changes (e.g. individual ponds drying) thereby maintaining long-term population viability. In view of this it would be anticipated that if Great Crested Newts were present in Waterbodies 10 or 15a, their eDNA would also be present in Waterbodies 11 and 15, which are within close proximity to these waterbodies and of at least limited suitability for this species.
- Further to the above, Waterbody 15a is considered unsuitable for Great Crested Newts due to the vertical concrete walls of the pond that would prevent Great Crested Newts from accessing the waterbody and therefore can be discounted.
- In addition, recent studies suggest that 95% of newt summer refuges are within 63m of breeding ponds. Waterbody 10 is located approximately 230m from the site and subsequently, if Great Crested Newts are present within the waterbody, it is unlikely that they would utilise the site during terrestrial phases.

4.3 In view of the above, it is considered highly unlikely that Great Crested Newts are present within the site during either breeding or terrestrial phases. Development of the site is therefore considered highly unlikely to have any adverse impact on Great Crested Newts and therefore no requirement for mitigation or licensing specific to Great Crested Newts has been identified.

4.4 Notwithstanding the above, development proposals should seek to maintain and where possible enhance future opportunities for Great Crested Newts and other amphibians at the site in accordance with the 2023 NPPF and 2006 NERC Act. This could be achieved through the retention, enhancement and creation of habitats suitable for amphibians as part of the landscape strategy for the site.

4.5 The site is currently dominated by short ruderal vegetation and bare ground which provides few opportunities for amphibians during terrestrial phases. Proposals for the site present opportunities to enhance and create new habitats for amphibians in the long-term. This could be achieved through implementing a selection of the following measures:

- Inclusion of areas of high value amphibian terrestrial habitat within areas of open space such as meadow and rough grassland, native species-rich scrub and woodland planting;
- Use of native species-rich hedgerow, scrub and tree planting to form new boundary features and/or complement existing boundary vegetation to enhance connective habitats across the site;

- Enhancement of woodland edge habitats through creation of ecotones (a gradation from woodland to scrub to rough grassland habitats), to provide a range of foraging and refuge opportunities;
- Provision of opportunities for hibernation and refuge through the provision of compost heaps, log/brash piles and purpose built hibernaculum;
- Creation of new open water wetland habitats suitable for breeding amphibians planted with a range of native aquatic and marginal vegetation, either as standalone features or as part of the site surface water drainage strategy; and
- Securing the long-term integrity of new and retained habitats through inclusion within a long-term management strategy.

5 CONCLUSION

5.1 Results of the HSI and eDNA survey indicate that Great Crested Newts are highly likely to be absent from the site. It is therefore considered highly unlikely that Great Crested Newts are present within the site and therefore no mitigation or licensing would be required for this species in relation to the proposed development.

5.2 Notwithstanding the above, in accordance with the 2023 NPPF and 2006 NERC Act, development proposals for the site should seek to provide opportunities for Great Crested Newts and other amphibian species within the site through creation, enhancement and long-term management of habitats as part of the landscape strategy for the proposed development. Measures by which this can be achieved are given in *Section 4 above*.

6 REFERENCES

Beebee, T. and Griffiths, R. (2000) *Amphibians and Reptiles*. Harper Collins, London.

Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R. A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA*. Freshwater Habitats Trust, Oxford.

Cresswell, W. and Whitworth, R. (2004) *An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt* Triturus cristatus. English Nature Research Report 576. English Nature, Peterborough.

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

Gent, T. and Gibson, S. (eds.) (1998) *Herpetofauna Workers' Manual.* JNCC, Peterborough.

HDA (2018) *Hogwood Farm, Finchampstead: Great Crested Newt Survey*. Hankinson Duckett Associates, Wallingford.

HDA Document Control and Quality Assurance Record

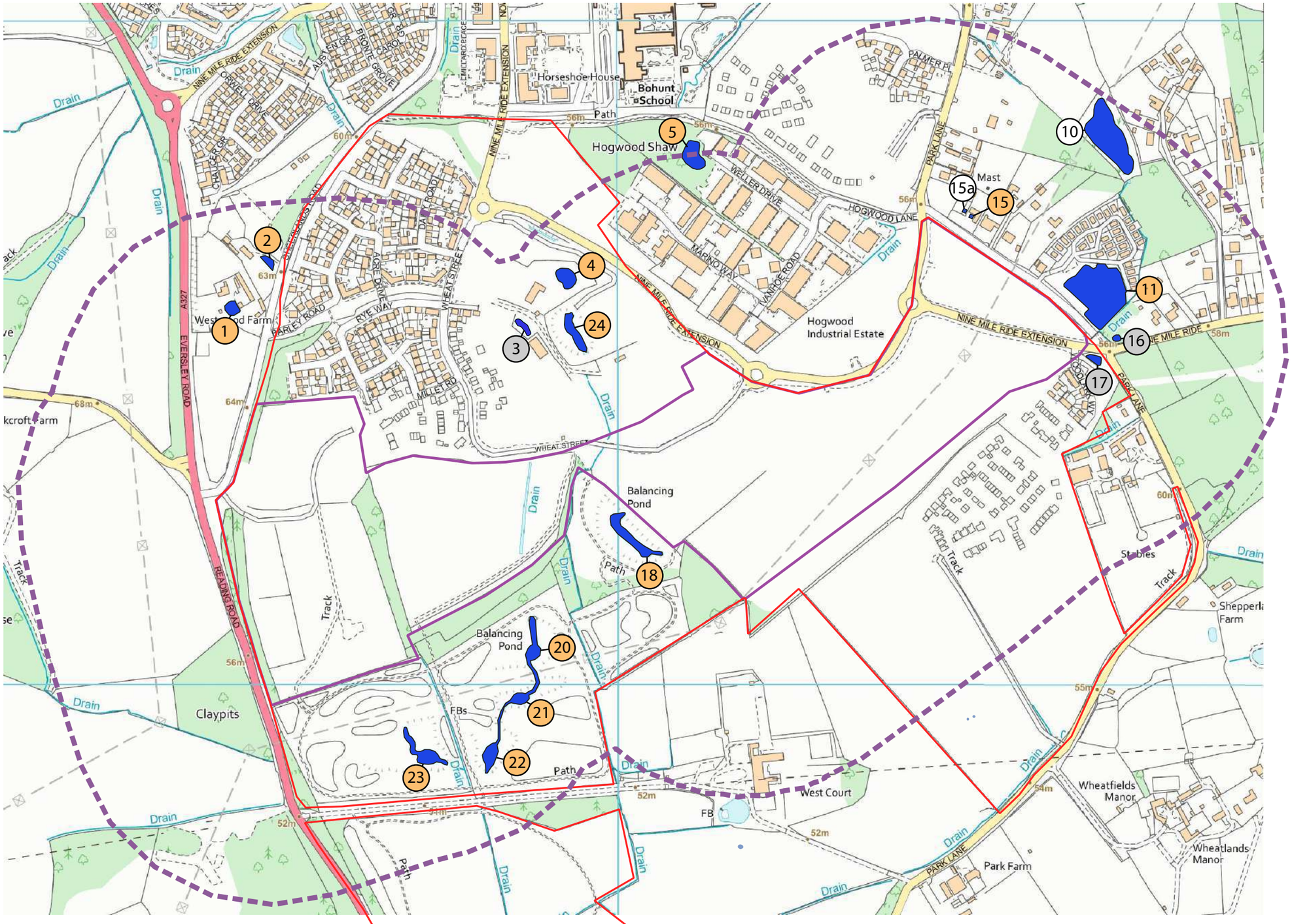
Project Title: Arborfield Eco
Project Reference: 868.1
Document Title: 2023 Great Crested Newt HSI and eDNA Survey Report
Commissioning Party: CALA Homes (Thames) Ltd

Issue	Description	Date of Issue	Signed
1	2023 Great Crested Newt HSI and eDNA Survey Report	May 2024	[redacted]

	Personnel	Position
Author	Robert Goldsmith	Assistant Ecologist
Approved for issue	Clare Bird MCIEEM	Associate Ecologist

APPENDIX A

Great Crested Newt HSI and eDNA survey summary plan



KEY

- Site Boundary
- Wider site boundary
- 300m radius of site
- (1) Waterbody reference
- Great Crested Newts confirmed absent by eDNA analysis
- Waterbody dry
- No access to waterbody granted to undertake Great Crested Newt eDNA survey

CLIENT:
CALA Homes (Thames) Ltd

PROJECT:
Arborfield Eco

TITLE:
2023 Great Crested Newt HSI and eDNA survey summary plan

SCALE AT A3:
1:7500

DATE:
May 2024

868.1 / 81

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Landscape Architecture
Masterplanning
Ecology

hda

APPENDIX B

Full HSI assessment results

Pond ID		Pond 1		Pond 2		Pond 4		Pond 5		Pond 11		Pond 15		Pond 15a	
SI Ref	**Description of Index**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**
SI1	Geographic location	A	1	A	1	A	1	A	1	A	1	A	1	A	1
SI2	Pond area m^2	300	0.6	200	0.4	450	0.9	900	0.98	5600	N/A	100	0.2	100	0.2
SI3	Pond permanence	Never	0.9	Never	0.9	Rarely	1	Never	0.9	Never	0.9	Never	0.9	Never	0.9
SI4	Water quality	Good	1	Moderate	0.67	Bad	0.01	Bad	0.01	Poor	0.33	Poor	0.33	Poor	0.33
SI5	Shading %	30%	1	50%	1	90%	0.4	90%	0.4	10%	1	10%	1	10%	1
SI6	Presence of waterfowl	Minor	0.67	Absent	1	Absent	1	Minor	0.67	Major	0.01	Absent	1	Absent	1
SI7	Presence of fish	Possible	0.67	Possible	0.67	Absent	1	Possible	0.67	Major	0.01	Major	0.01	Major	0.01
SI8	Pond density in area	6.3	1	6.3	1	7.3	1	10.5	1	7.6	1	7.9	1	7.9	1
SI9	Terrestrial habitat quality	Moderate	0.67	Good	1	Moderate	0.67	Moderate	0.67	Moderate	0.67	Poor	0.33	Poor	0.33
SI10	Macrophyte cover in pond	30%	0.6	10%	0.4	0%	0.3	10%	0.4	10%	0.4	40%	0.7	40%	0.7
HSI	Overall HSI for pond:	**0.792**		**0.760**		**0.485**		**0.460**		**0.271**		**0.411**		**0.411**	
	Comments:	**Good**		**Good**		**Poor**		**Poor**		**Poor**		**Poor**		**Poor**	

Pond ID		Pond 18		Pond 20		Pond 21		Pond 22		Pond 23		Pond 24	
SI Ref	**Description of Index**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**	**Measure / Comment**	**SI score**
SI1	Geographic location	A	1	A	1	A	1	A	1	A	1	A	1
SI2	Pond area m^2	1100	0.92	700	1	550	1	800	1	900	0.96	850	0.98
SI3	Pond permanence	Sometimes	0.5	Rarely	1	Sometimes	0.5	Sometimes	0.5	Sometimes	0.5	Never	0.9
SI4	Water quality	Good	1	Good	1	Good	1	Good	1	Good	1	Moderate	0.67
SI5	Shading %	10%	1	10%	1	10%	1	10%	1	0%	1	10%	1
SI6	Presence of waterfowl	Minor	0.67	Minor	0.67	Minor	0.67	Minor	0.67	Minor	0.67	Major	0.01
SI7	Presence of fish	Possible	0.67	Possible	0.67	Possible	0.67	Possible	0.67	Possible	0.67	Possible	0.67
SI8	Pond density in area	7.3	1	5.7	1	5.7	1	5.7	1	5	1	7.3	1
SI9	Terrestrial habitat quality	Good	1	Good	1	Good	1	Good	1	Good	1	Moderate	0.67
SI10	Macrophyte cover in pond	70%	1	70%	1	40%	0.7	60%	0.9	80%	1	10%	0.4
HSI	Overall HSI for pond:	**0.854**		**0.923**		**0.831**		**0.852**		**0.858**		**0.504**	
	Comments:	**Excellent**		**Excellent**		**Excellent**		**Excellent**		**Excellent**		**Below average**	

APPENDIX C

eDNA sampling analysis results

SureScreen Scientifics

Folio No: E18807
Report No: 1
Purchase Order: 868.1
Client: HDA
Contact: Bob Goldsmith

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 06/07/2023
Date Reported: 19/07/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
5983	Arborfield - Pond 24	SU 76934 64539	Pass	Pass	Pass	Negative	0
5984	Arborfield - Pond 4	SU 76931 64613	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Jennifer Higginbottom

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

SureScreen Scientifics

Folio No: E18114
Report No: 1
Purchase Order: 868.1
Client: HDA
Contact: Bob Goldsmith

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 16/06/2023
Date Reported: 27/06/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
0060	Aborfeild - Pond 23	SU 7671 6389	Pass	Pass	Pass	Negative	0
0062	Aborfeild - Pond 15	SU 777587 6473	Pass	Pass	Pass	Negative	0
0064	Aborfeild - Pond 2	SU 7647 6463	Pass	Pass	Pass	Negative	0
0065	Aborfeild - Pond 20	SU 7687 6404	Pass	Pass	Pass	Negative	0
0066	Aborfeild - Pond 5	SU 7711 6479	Pass	Pass	Pass	Negative	0
0072	Aborfeild - Pond 11	SU 777 46458	Pass	Pass	Pass	Negative	0
0073	Aborfeild - Pond 22	SU 7680 06389	Pass	Pass	Pass	Negative	0

0074	Aborfeild - Pond 18	SU 7701 6421	Pass	Pass	Pass	Negative	0
0076	Aborfeild - Pond 1	SU 7642 6456	Pass	Pass	Pass	Negative	0
0079	Aborfeild - Pond 21	SU 7684 6397	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Jennifer Higginbottom

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected,

samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result:

Presence of GCN eDNA [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

APPENDIX D

Waterbody photographs

Photo 1:
Waterbody 1

Photo 2:
Waterbody 2

Photo 3:
Waterbody 4

Photo 4:
Waterbody 5

Photo 5:
Waterbody 11

Photo 6:
Waterbody 15

Photo 7:
Waterbody 15a

Photo 8:
Waterbody 18

Photo 9:
Waterbody 20

Photo 10:
Waterbody 21

Photo 11:
Waterbody 22

Photo 12:
Waterbody 23

Photo 13:
Waterbody 24

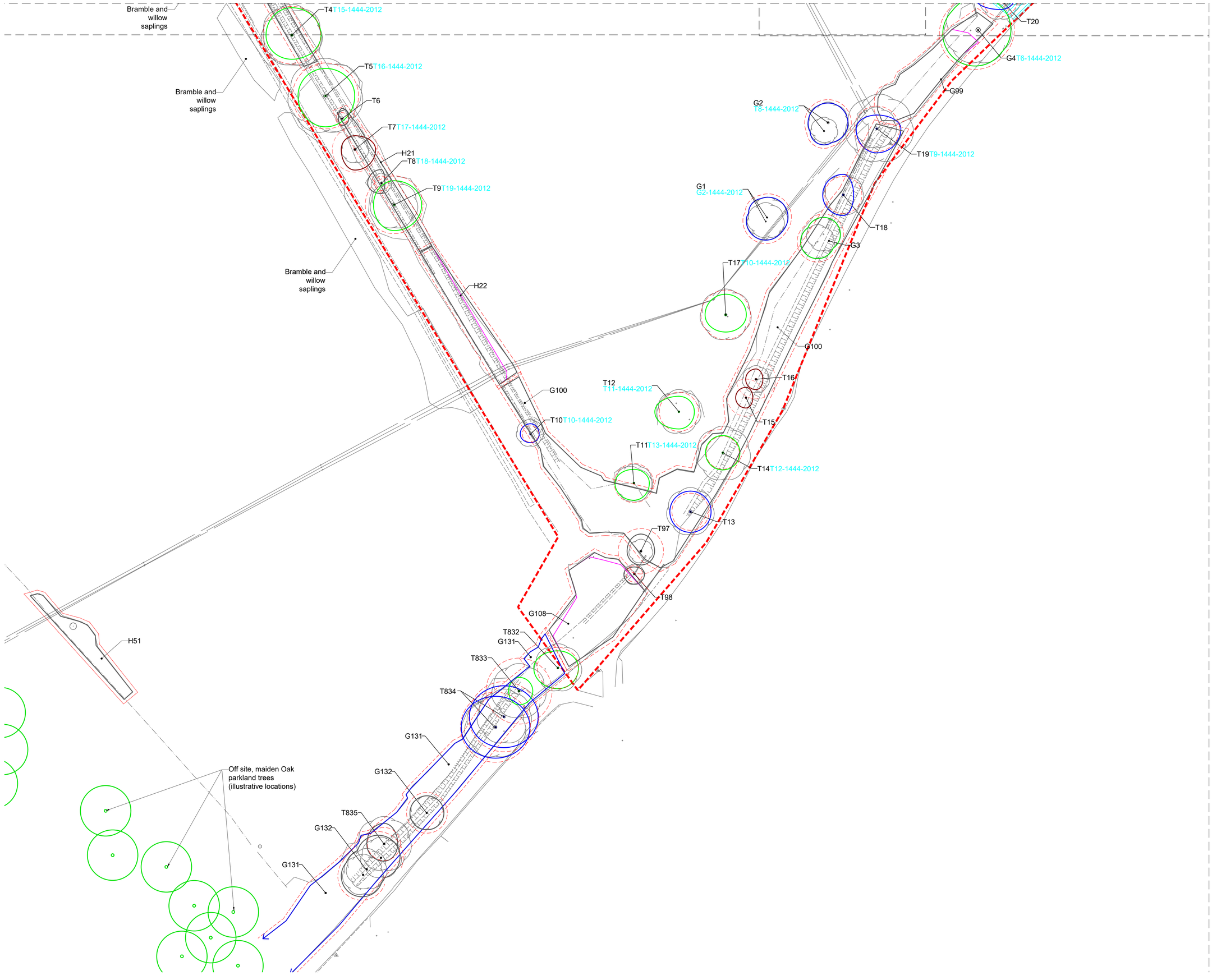
APPENDIX G

Evaluation Criteria

Criteria used for the evaluation of ecological receptors (based on Ratcliffe, 1977; CIEEM 2018)

Assigning value is relatively straightforward in the case of designated sites, and undesignated sites meeting designation criteria. However, in most cases evaluation of ecological resources is not straightforward and requires a degree of knowledge, experience and professional judgement (Usher,1986; Spellerberg, 1992). Evaluation of an ecological receptor was based on a number of criteria (Ratcliffe, 1977; CIEEM 2018).

- Site designations; SPA, SAC, Ramsar, SSSI, NNR, LNR, SINC or equivalent.
- Site designation criteria; e.g. Guidelines for the Selection of Biological SSSIs (JNCC, 1989).
- Conservation status; whether a habitat or species is rare, declining or threatened at a given geographic scale.
- Geographic location; the value of a habitat or species may change depending on whether it is being assessed in the south of England or the north of Scotland.
- Distribution; habitats or species on the edge of their distribution, particularly where that distribution is changing as a result of global trends and climate change and endemic species or locally distinct sub-populations of a species are more valuable;
- Rarity; the presence of habitats, species, subspecies or varieties that are rare or uncommon at a given geographic scale.
- Diversity; of habitats, or species, particularly of vascular plants. Species-rich assemblages of plants or animals are likely to be important in terms of biodiversity;
- Naturalness; habitats least affected by human disturbance are normally of relatively higher importance.
- Size; larger areas are generally more valuable than lots of small ones. Notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context may be important.
- Fragility; sensitivity to, and probability of, human impact.
- Typicalness; a good example of the type, particularly plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities.
- Potential value (if restored to favourable conservation status).
- Secondary or supporting value; value of a receptor in supporting the integrity or conservation status of another valued receptor.
- Ability to be recreated; the more difficult a habitat is to re-create, were it to be destroyed, the greater the importance usually attached to it.



Notes

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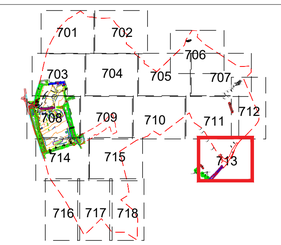

KEY PLAN (NTS)

Key

N

- Survey boundary.
- T1 — Tree with numbered reference. Canopy spread and BS5837:2012 tree quality category as shown below.
- T1# — Tree (location estimated) with numbered reference. Canopy spread and BS5837:2012 tree quality category.
- T1* — Tree off-site with numbered reference. Canopy spread and BS5837:2012 tree quality category.
- G1 — Vegetation group with numbered reference. Canopy extents and BS5837:2012 tree quality category as shown below.
- H1 — Hedge with numbered reference. Width and BS5837:2012 tree quality category as shown below.

BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
- Category B - Moderate quality
- Category C - Low quality
- Category U - Unsuitable for retention

- T1 (G1) — Tree protected by Tree Preservation Order issued by Wokingham District Council number reference relates to the various TPO Schedules.
- (G1) — Root protection area (RPA) Calculated in accordance with Section 4.6 - BS5837:2012
- Ancient Woodland (© Natural England Copyright 2018)
- 15m Offset from Ancient Woodland (line taken from Natural England GIS Database)
- 15m Offset from suggested Aged Woodland
- Veteran Tree
- 5m offset from hedgerow edge (measured from edge of canopy)

NOTES:

- Refer to RPS Tree Survey Report & Schedule for further details.
- Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
- Plan produced in accordance with recommendations set out in BS 5837:2012 - 'Trees in Relation to design, demolition and construction'.
- Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period; generally, although not restricted to, March - August inclusive.
- Survey based upon topographic survey produced by in 2017

Rev	Description	Date	Initial	Checked
B	Tree survey updated	02 / 24	DC	DC
A	First Issue	02/2018	SH	DC

MAKING COMPLEX EASY

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Client: Legal & General Homes

Project: Hogwood Farm Finchampstead

Title: Tree Survey

Status	Drawn By	PM/Checked by
Planning	SH	DC

Job Ref	Scale @ A1	Date Created
JSL2891	1:500	Dec 2017

Drawing Number	Rev
713	B

rpsgroup.com

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APPENDIX E: DAILY ENVIRONMENTAL RECORD FORM

JNP GROUP
CONSULTING ENGINEERS

Offices Nationwide
Brighouse · Bristol · Chesham · Glasgow
Hartlepool · Leamington Spa · Sheffield
jnpgroup.co.uk

EXAMPLE DAILY SITE ENVIRONMENT FORM

To be completed daily by the constructed Manager/ Environmental Manager and retained on site within the Environmental File for submission with the Monthly Environmental Report

Date Action	Mon	Tue	Wed	Thu	Fri	Sat	Week Ending / /
Noise and Vibration							
Noise and Vibration							
Dust/Air Quality							
Archaeology							
Ecology							
Water Resources							
Ground Conditions, Contamination and Hazardous Material							
Soil and Water Management							
Sediment Controls							
Off Site Disposal							
Roads clean of dirt/mud							
Stockpiles							
Waste Management: Hazardous Waste							
Asbestos							
Hydrocarbon							
Other							
Waste Management: Non-hazardous Waste							
Soil							
Steel							
Demo Waste							
General							
Weather							
Rain (mm)							
Wind max (km/hr)							
Other							
Maximum Trip							
Complaints Received							
Refuelling							
Other (as required)							
Additional Comments:							

Environmental Manager/ Site Manager	Construction Manager / Project Manager
Name:	Name:
Sign:	Sign:

JNP GROUP

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