



**Land to rear of Fox & Hounds,
Bromley, Standon, Ware, SG11 1NX**

Ecological Impact Assessment



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Client	[REDACTED]
Job title	Fox & Hounds, Bromley
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	Name	Position	Date
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Declaration of compliance

The information we have provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

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1. Introduction

1.1 Aims of Study

Denny Ecology was commissioned to undertake a Preliminary Ecological Appraisal of the proposed development Site (from hereon referred to as 'the Site') in May 2023. This report details the methods and results of this study and assesses these results in relation to the potential ecological effects of the proposed development.

As a result of the PEA survey, a further great crested newt eDNA survey of an adjacent pond was recommended. This was commissioned and undertaken in June 2023, and this report also covers the details and assessment of this survey as well. As no further ecology surveys were recommended following these two surveys, this report becomes an Ecological Impact Assessment for the proposed development.

1.2 Site Location

The Site, which is the subject of this planning application, is situated in a rural location southeast of the village of Standon in Hertfordshire, at OS grid reference TL 41334 21434 (What3Words: boring.mostly.glad). It is located 7.5km west of Bishops Stortford town centre and is within the jurisdiction of East Herts District Council.

1.3 Site Description

The Site extends to 0.2760ha and comprises the rear portion of a large rural garden. The Site contains a tennis court, an outdoor swimming pool and single-storey pool building, surrounded by vegetated garden habitats comprising mostly grassland, with scattered trees and ornamental shrubs. The Site is bounded by hedgerows lines of trees.

The Site is surrounded by other large rural properties with gardens and associated small grass paddocks to the east and south, with large open arable fields beyond.

1.4 Proposed Works

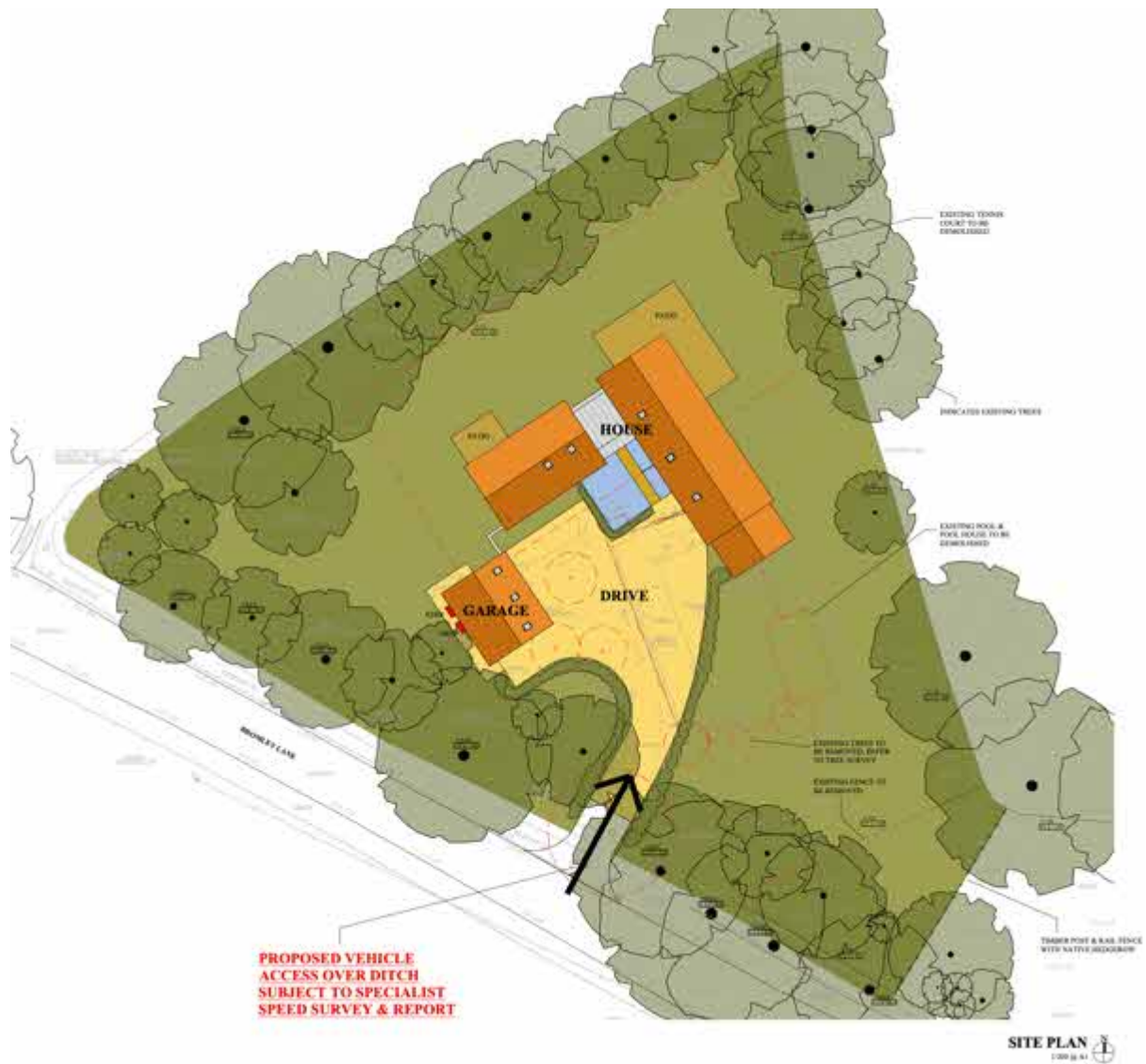
The plans are to demolish the existing swimming pool, pool house and tennis court, and build a new dwelling and separate garage building. The dwelling will have two sections: a 2.5 storey main section and linked 1.5 storey section, both with living space within the roof area. The garage building will be 1.5 storey, with an annex/office in the roof area. The footprint of the new buildings and hardstanding for access will be across existing areas of the tennis court, swimming pool area and the section of garden with the three fruit trees.

We understand an external swimming pool is also likely to be designed into the plans, but do not know whether the remaining garden will be re-landscaped, although the southeast boundary will be re-aligned and approximately 60m of new species-rich native hedgerows will be planted, 15m on the southeast boundary and 45m along the new driveway.

A new vehicle entrance will breach a 4m wide section of the existing hedgerow near the southwest

corner of the Site, from the adjacent Bromley Road. Four small existing fruit trees, a 2m long yew hedgerow and three ornamental shrubs will be removed to facilitate access and development. A tall Leyland cypress hedgerow to the northwest of the tennis court will be removed. The preliminary proposed layout plan is shown in Figure 1 below.

Figure 1. Preliminary proposed layout plan



2. Methods

2.1 Desktop Survey

A web-based search was undertaken for details of protected sites and species and priority species and habitats that might be impacted by this proposal. The search was extended to a 500m radius, or within the 1-km² in which the Site is located (grid square TL4727). As bats use features on and in buildings and trees to roost, they were scoped into the desk study, as well as great crested newts (which could use vegetated habitats during their terrestrial phase), reptiles, and terrestrial mammals that use gardens such as badgers and hedgehogs. All other protected species and designated wildlife sites were scoped out of the desk study, as they were considered highly unlikely to be impacted by such a small-scale proposal. Priority habitats were scoped into the search, as certain priority habitats can occur in or close to gardens.

Natural England's MAGIC website (www.magic.defra.gov.uk) was consulted along with other existing ecological data sources. Given the small scale of the proposed development, it was considered unnecessary to request records from the Herts Environmental Records Centre.

In addition, the OS 1:10,000 map of the area, and an aerial photograph on Google Earth (Google Inc 2011), were examined to determine the possible habitats present on, and adjacent to the Site. In particular, we searched for ponds and other waterbodies near to the Site, within a 250m buffer, to assess potential for breeding amphibians to disperse to the Site.

2.2 Extended Phase 1 habitat and species survey

A Site survey visit was made on 31st May 2023. The weather conditions were warm (17°C), dry and overcast, with a light NE breeze. The survey was undertaken by Dr Matthew Denny MCIEEM, a Suitably Qualified Ecologist who holds a PhD in ecology.

The Site was walked to assess habitats according to UKHabs classification methods (UK Habitat Classification 2021). In addition, evidence of, and potential for habitats to support protected species and other species of importance, was recorded, and general potential ecological constraints for the proposed development were assessed following preliminary ecological appraisal survey methodology (CIEEM 2017). In particular, the building and trees on the Site were assessed for potential to support roosting bats (following methods recommended by the Bat Conservation Trust (BCT 2016)) and nesting birds, and habitats were assessed for their potential to support amphibians, reptiles, and terrestrial mammals. Evidence of bat presence, such as droppings, urine and oil stains, and dead or live bats, were searched for in and around the building and trees, including the roof space. Accessible ponds within 250m of the Site were inspected visually to assess their potential to support great crested newts (GCNs) using the Habitat Suitability Index (HSI) methodology (Oldham et al. 2000).

2.2 Great crested newt eDNA survey

An e-DNA survey was recommended and subsequently undertaken of the pond on the opposite side of Bromley Lane: Pond 2 on Figure 1. The survey was undertaken on 21st June 2023 by Heather Matthews MCIEEM, a Suitably Qualified Ecologist who holds a Natural England great crested newt survey licence. Weather conditions were warm (17°C) and overcast, with a light NE

breeze.

Twenty 30ml water samples were collected from locations evenly spaced around the pond, where safe access allowed, following a standard method (Briggs *et al.*, 2014). These samples were then combined in a Whirl-Pak bag and gently mixed for 10 seconds. Six 15ml eDNA samples were then transferred from the Whirl-Pak bag into tubes containing 35ml of ethanol preservative using a sterile pipette and gloves. Preserved eDNA samples were boxed and sent for laboratory analysis within 24 hours of collection, and then analysed in line with the approved quantitative PCR method (Briggs *et al.*, 2014) at SureScreen Scientifics' laboratory, a Natural England approved test laboratory for GCN e-DNA.

Amphibians

There are no existing records of great crested newts *Triturus cristatus* (GCNs) within 1km of the Site, and none of any other amphibian species.

Bats

A search of MAGIC for granted European Protected Species (EPS) mitigation licences for bats, returned information on two licences within 1km: 700m to the northeast and 875m to the east-northeast, the former a common pipistrelle breeding roost and the latter a common pipistrelle non-breeding roost. We found no other web-based records for any bat species within 1km.

Reptiles

No existing records of any reptile species within 1km of the Site were found.

Badger

No existing records of badger within 1km of the Site were found.

Hedgehogs

There is a single existing hedgehog record within 1km of the Site from an undisclosed location within the 1km-square in which the Site is located, recorded in 2005.

3.2 Extended Phase 1 Habitat Survey

Please refer to the habitat map in Figure 3 while reading these results. In addition, photographs of habitats and notable ecological features within the Site, are presented in Appendix 1.

The Site comprises the swimming pool, paved areas around it and associated building, the tennis court, and vegetated garden habitats. Along the northeast boundary is an intact native species-rich hedgerow with some trees along the western half. There is a tree line along the northwest boundary, comprising a mix of native and non-native tree species (Photo 5), associated with a dry ditch at their base. Of note in this tree line are mature specimens of field maple. Along the southwest boundary is a species-rich hedgerow with a dry ditch at its base and scattered native and non-native trees within or offset from it. Beyond this a 1m-wide road verge comprising species-poor semi-improved grassland.

There are three hedgerow sections within the garden: a short section of yew *Taxus baccata* near the southern corner, a short section of Leyland cypress *Cypressus leylandii* along the north corner of the swimming pool compound wall, and a longer section of Leyland cypress along the northwest edge of the tennis court compound. We understand that all these will be removed, the former two to facilitate development and the latter given its poor condition (see associated tree plan: Arborterra 2023). For further details of the species and size of all trees within the Site, see the associated tree survey (Arborterra 2023).

The northeast boundary hedgerow comprises the following seven native and two non-native woody species:

- Hawthorn *Crataegus monogyna*
- Elder *Sambucus nigra*
- Pedunculate oak *Quercus robur*
- Field maple *Acer campestre*
- Ash *Fraxinus excelsior*

Privet *Ligustrum vulgare*
Dog rose *Rosa canina*
European plum *Prunus domestica**
Sycamore *Acer pseudoplatanus**

* = non-native species

The southwest boundary hedgerow comprises the following eleven native, and two non-native woody species:

Hawthorn
Ash
Oak
Privet
Field maple
Elder
Spindle *Euonymus europaeus*
Hazel *Corylus avellana*
Elm *Ulmus sp.*
Dogwood *Cornus sanguinea*
White bryony *Bryonia dioica*
European plum*
Sycamore*

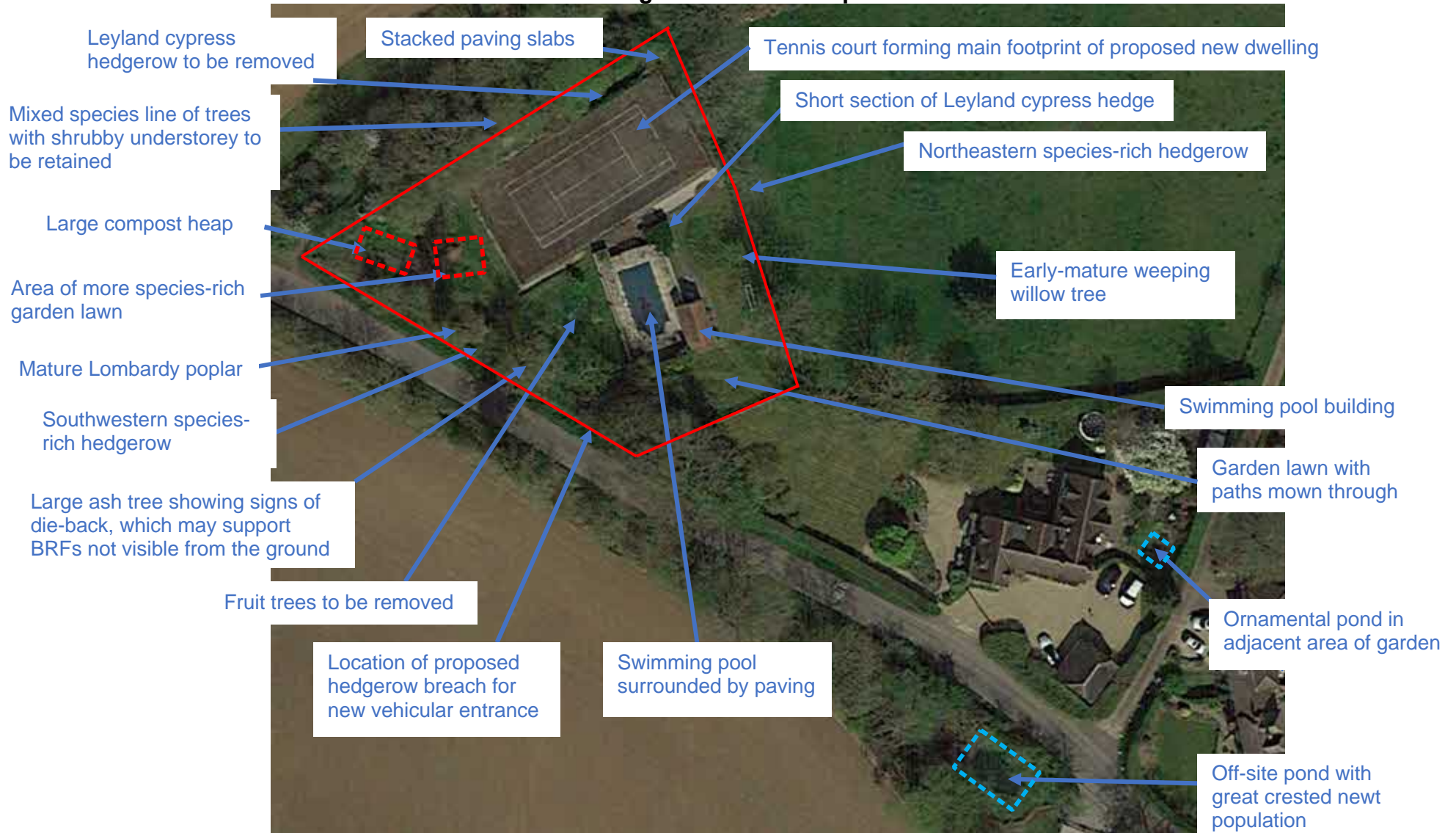
The number of native woody species recorded in the central 30m sections of the northeast and southwest hedgerows, were seven and nine respectively. In addition, a dry ditch was present along the southwest hedgerow. Therefore, both are classed as a Priority hedgerow, protected under the 1997 Hedgerow Regulations.

The garden habitats comprise mostly amenity grassland, much of which was uncut at the time of survey, with pathways mown through it. This grassland is dominated by perennial rye grass *Lolium perenne*, rough meadow-grass *Poa trivialis* and red fescue *Festuca rubra*. South of the tennis court is a small patch (c.10m²) with agrimony *Agrimonia eupatoria*, cowslip *Primula veris* and ox-eye daisy *Leucanthemum vulgare* present along with the more ubiquitous species recorded in lawn elsewhere on site. All grassland has been classified as modified grassland, typical of garden lawns.

There are also occasional scattered trees comprising a silver birch (Photo 10), two weeping willows, three fruit trees (Photo 3), including apple *Malus* and a possible common medlar *Mespilus germanica* and ornamental shrubs. In the west corner is a large compost heap with colonising nettles *Urtica dioica* (Photo 7), with a similar but much smaller compost heap near the south corner, behind the silver birch (Photo 10). There are some stacked paving slabs in the north corner of the Site (Photo 8).

The habitats of greatest ecological significance are the native species-rich hedgerows, the mature trees and the small patch of more species-rich grassland. Only a small 4m-wide section of species-rich hedgerow will be removed, and the proposal includes planting of approximately 60m of new species-rich native hedgerow, resulting in a large significant gain. No large mature trees will be removed. It is not known at this stage whether the patch of more species-rich grassland will be retained, but its loss can be easily compensated through planting of new wildflower meadow.

Figure 1. Habitat map of site



Buildings and ground-level tree inspection for roosting bats

Pool building

This is a single-storey, building used to house the swimming pool equipment. It is considered to date from the late twentieth century and is constructed of rendered breeze-blocks with a clay tile roof. The render, soffits and roof were in relatively good condition, with no cracks, splits or gaps suitable for access to the interior of the building or for roosting bat features in their own right, are present. The interior space, including the roof space, were inspected and found to have no suitable bat roosting features and no evidence of bat presence. The roof space is small (6m x 4m) and low (1m to apex height) with modern machine cut timbers and 1F roof felt lining in excellent condition. Overall the building was assessed as having negligible bat roosting potential.

Trees

Under current proposals, the only trees due for removal are the three small fruit trees west of the swimming pool area (see Figure 3), and the cherry plum numbered T11 in the tree survey. The cherry plum is mature, but small (6m ht with DBH of 14cm). No bat roost features were located on this tree during the inspection. The three other fruit trees are all young specimens with no bat roost features. If the proposal changes, it may be that a nearby silver birch (Photo 10) would be at risk of removal. This tree is early mature and small, and no bat roost features were located.

There are three larger trees close to the proposed hedgerow breach location: a mature oak just outside the Site boundary (T9 on the tree survey), and early mature sycamore (T10) and an ash (T15). The sycamore was assessed as having negligible bat roost potential, but due to their maturity and size and the presence of some dead wood, the oak and ash were assessed as having at least low bat roost potential. If proposed plans change and either of these trees are to be removed, we recommend an aerial inspection is undertaken to assess whether bat roost features are present in locations not visible from the ground. It is understood that all other trees on the Site will be retained, and therefore no ground-level bat roost inspection was undertaken of further trees.

Protected and priority species

Given the habitats on the Site and the existing species records from the areas, the only protected and priority species likely to be present on the Site are great crested newts, reptiles, hedgehogs, nesting birds and bats.

Great crested newt

All the vegetated habitats have potential to support great crested newts and other amphibians during their terrestrial phase.

Ten characteristics of both ponds within 250m of the Site were measured and inputted to the Habitat Suitability Index calculator tool (Windrush Ecology website: <https://hsicalculator.wordpress.com/4-2/>) after Oldham et al. 2000. Pond 1 was calculated to have a HSI score of 0.72, conferring a 'good' suitability. We therefore assumed it could well support the species and an eDNA presence/absence survey for the species was recommended and subsequently commissioned in June 2023.

Pond 2 was calculated to have a HSI score of 0.63, conferring an 'average' suitability. Given Ponds 1 and 2 are only 35m apart (within routine GCN dispersal distance) we assumed that should Pond 1 support GCNs, they are likely to make some use of Pond 2 but would be absent from the latter if absent from the former. Therefore, no further surveys were recommended for Pond 2.

Reptiles

The compost heaps have potential to support grass snakes *Natrix Helvetica*, and the longer grass and stacks of paving slabs could be used occasionally by this species. However, overall the Site was considered sub-optimal for reptiles, with no suitable habitats present for any other species.

Given there are no reptile records within 1km, and that the Site is surrounded by unsuitable arable farmland in the wider landscape, we consider it highly unlikely that reptile species other than grass snake occur on the Site. It is possible grass snakes occur. Therefore, below we recommend suitable working methods to avoid the potential of killing and injuring grass snakes, and creation of grass snake friendly habitats within the new garden, namely a new dedicated compost heap and areas of wildflower grassland.

Nesting birds

Potential nesting bird habitat to be impacted are the fruit trees, the Leyland cypress, yew and 4m section of the southwest hedgerow, and a few shrubs due for removal. Therefore, below we recommend suitable working methods to avoid the potential of directly impacting nesting birds. Planting of new hedgerow will result in a net gain in bird-nesting habitat within the Site.

Bats

The potential for roosting bats on the Site is detailed above. The hedgerows and trees around the Site have potential to support foraging and commuting bats. Impacts on these habitats will be minimal, and below we recommend habitat creation to fully compensate for this loss. However, there is also potential for indirect impacts through inappropriate lighting design allowing light to spill onto these habitats, and newly created bat habitats. Appropriate mitigation is therefore recommended below.

3.2 Pond 1 eDNA survey for GCN presence/absence

The eDNA survey results for the pond were positive, meaning that there is an existing population of great crested newts (GCNs) using the pond. This also means it is likely that Pond 2 is also used by small numbers of GCNs. The results returned six positive replicates out of a total of 12 (see Laboratory Results Report in Appendix 2). The results commentary states the following:

It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies.

Therefore, we can assume that there is a small-moderate sized population present. Whilst this can't be strictly relied upon, in this case it helps guide the mitigation requirements.

Müllner (2001) found that GCNs prefer to use suitable terrestrial habitat when available, such as woodland, within a zone of about 5 to 50 metres from breeding ponds. Pond 1 has a block of broad-leaved woodland and scrub immediately surrounding it to the southwest, west and north, which will likely discourage GCNs to disperse further in this direction and cross the road towards the Site.

As all work will be over 50m from either pond, and both ponds are surrounded by moderate to high suitability terrestrial habitats, we consider it unlikely that GCNs will disperse as far as the proposed development site. We therefore conclude that none of the work will pose any more than a very low risk to the species and we predict no likely significant impacts on GCNs. However, as there are

small areas of suitable GCN habitat on Site, we recommend precautionary working methods below to ensure none are killed or injured, and to ensure suitable mitigatory action is taken should a GCN be discovered during work.

4 Enhancements, Mitigation and Conclusions

4.1 Enhancement and Mitigation

The works primarily affect habitats of no or negligible ecological value, with only small sections of habitats of higher value impacted. Therefore, we assess the overall ecological impacts as being minor at the Parish/local scale, and all these can be effectively mitigated within the current proposed scheme. In line with the NPPF (2023) and the Environment Act (2021), we recommend the following ecological enhancements.

Species-rich native hedgerows

Approximately 60m of species-rich native hedgerow is proposed. This will compensate for the loss of 4m of this existing resource, and result in significant enhancement. This will provide cover for birds, invertebrates and terrestrial fauna. The following are suggestions for mixed native-species hedging packs for birds and invertebrates:

https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/plants-for-wildlife/garden-hedges/?channel=paidsearch&gclid=Cj0KCQiAip-PBhDVARIsAPP2xc3lfDzo8bve9m8QKQ9UgZqYqTKOXZ7mGasfmwZe-PIJ1OtyQxJATwaAhAHEALw_wcB&gclid=aw.ds

<https://www.best4hedging.co.uk/rspb-approved-economy-bird-friendly-hedging-p201>

<https://www.best4hedging.co.uk/rspb-approved-ultimate-bird-friendly-bundle-p203>

<https://www.habitataid.co.uk/products/hedge-mix-conservation-hedge>

Wildflower meadows

We recommend any new garden lawn areas are sown with Wildflower lawn seed mix (Emorsgate EL1 <https://wildseed.co.uk/>). These can be sown and managed as a normal lawn but will provide a much wider variety of plant species, and a richer diversity of native flowers and grasses than a standard lawn mix, providing more colour as well as foraging habitat for pollinating insects and birds. These can be mown as frequently as required, as a standard lawn would be. However, we recommend against the use of herbicides and pesticides, which will compromise both the plant diversity within the lawn and the use of the lawn by fauna such as birds and hedgehogs, and may result in harm to the latter.

We recommend that a sunny corner of the garden is sown with an appropriate wildflower meadow mix (e.g. Emorsgate EM2 meadow mixture). This can be oversown onto existing grassland if some is retained, to improve the plant diversity. Although we recommend surface scarification prior to sowing if this is the case. The wildflower meadow should then be managed as a traditional hay meadow, cutting only from mid-July onwards, and removing all arisings. If new grassland is sown, we recommend a seedbed is created on subsoil rather than topsoil, as meadows are best established on low fertility soils.

Formal planting beds

We assume there will be some form of formal garden planting, which can play an important role in attracting pollinating and other invertebrates, which in turn attract birds, bats, and other

insectivorous species. Any formal planting beds proposed should be planted with species specially selected for this role. The following list is a suggestion of plant varieties that can be used:

Purple toadflax *Linaria purpurea*
Verbena bonariensis
Marjoram *Origanum vulgare*
Lavender *Lavandula* spp. incl. *angustifolia*, *hidcote*
Hyssop *Hyssopus officinalis*
Honesty *Lunaria annua*
Eryngium sp.
Hebe sp.
Tobacco plant (*Nicotiana tabacum*)
Honeysuckle, to be trained up walls/fences

Great crested newts and grass snakes

To prevent killing or injuring GCNs and grass snakes during development work in the unlikely event of a GCN venturing as far as the Site, we recommend that all long grass be cut at least 48 hours prior to work commencing to encourage any GCNs and other animals present to disperse into adjacent areas. All works affecting potential amphibian and reptile habitat should proceed using precautionary methods, with finger-tip searching by an ecologist prior to work commencing, followed by a careful destructive search using hand tools only. Habitats of particular concern are the longer grass, hedgerows, stacked paving slabs and compost heaps. Once this destructive search of focal habitats is complete, if no GCNs are found, work can proceed as required. If GCNs are found on Site, working should cease immediately and the advice of a qualified ecologist should be sought.

There is an opportunity for the new development to provide enhancement specifically for amphibians and grass snakes. We recommend the provision of a dedicated compost heap area, e.g. one constructed from wooden pallets or similar materials, in a sunny, quiet location within the new garden. The provision of a log habitat pile, as detailed below, will result in addition shelter and potential hibernation habitat for these species.

Nesting birds

Clearance of all woody vegetation should be done in the period September-February, outside the bird nesting season. If that is not possible, an ecologist should survey these areas of vegetation for nesting birds immediately prior to removal, and delay removal appropriately if active nests are present.

There is an opportunity for the new development to provide enhancement specifically for birds. We recommend the provision of at least three bird-nesting boxes or features installed on existing trees or integrated in the new building.

Bats

No bat roosts will be impacted by the proposed development. However, the Site comprises some mature trees with potential bat roost features and hedgerows, which may be used by foraging and commuting bats. To ensure the development does not negatively impact use of the Site by bats,

we recommend that external lighting in the proposed development design is minimized and should not shed light on retained and newly planted woody vegetation, and particularly not across potential roosting features.

The following design principles should be employed in the lighting design scheme:

- space lights as widely as possible;
- keep height of lighting columns as low as possible – low level bollard lights are best;
- keep light spread below the horizontal, using cowls or other shielding devices as well as directional beams;
- white light from LEDs is usually produced by emitting a combination of different wavelength colours - if possible, use narrow spectrum lamps emitting a peak higher than 550nm;
- keep brightness as low as possible and below 3 lux (1 lux preferable) at ground level;
- Keep lights from illuminating identified potential bat features, namely the boundary hedgerows, trees and proposed bat roost features.

The only potential bat foraging and commuting habitat to be impacted is the removal of a 4m wide section of the southwest hedgerow and the adjacent fruit trees. As the hedgerow is already discontinuous within 50m either side of the proposed breach, an additional gap should not impact its current use by commuting bats. A new 15m length of species-rich hedgerow is proposed for the new southeast Site boundary. This will not only compensate for the 4m breach loss but will bring significant enhancement to potential bat dispersal corridors by creating a new hedgerow link between the southwest and northeast hedgerows. Planting of an additional 45m of species-rich native hedgerow around the new driveway will result in significant enhancement to bat foraging habitat on the Site.

There is an opportunity for the new development to provide enhancement specifically for bats. We recommend the installation of at least three bat roosting features/boxes on existing trees or the new building, installed at least 2.4m above ground level with south, southeast or southwest aspects. These could be integrated 'bat bricks' or externally/tree mounted boxes, available from specialist supplier ((e.g. <https://www.nhbs.com>)).

For example:

Eco Kent Bat box: <https://www.nhbs.com/eco-kent-bat-box>

Eco Vincent Pro Bat Box: <https://www.nhbs.com/vincent-pro-bat-box>

Schwegler 2F: <https://www.nhbs.com/2f-schwegler-bat-box-general-purpose>

Hedgehogs, insects and other animals

The native hedgerows, trees, planting beds and wildflower-rich lawns recommended above, will provide ideal foraging habitat for hedgehogs, insects and other animals. To provide further features to enhance the site we recommend installing the following:

A hedgehog nesting feature – we recommend a HH7 Hogilo Hedgehog or a Mammal House (<https://www.nhbs.com/search?q=hedgehog+box&qtview=182807>) or a Wooden Hedgehog Nest Box (<https://www.nhbs.com/search?q=hedgehog+box&qtview=162120>)

A large solitary bee nesting-box (<https://www.nhbs.com/solitary-bee-hotel>) installed in a sunny position.

A log habitat pile in a sunny position, preferably comprising a pile of stacked small-medium sized logs, up to 75cm high and measuring at least 1m x 1m, which can be capped and

sown with wildflower turf as shown in Figure 4 below. This could use the logs resulting from the felled fruit trees.

We understand that no close-board fencing will be installed, only post-and-rail fencing. Should this change, to ensure the site remains fully accessible following development, any close-board fencing should be fitted with hedgehog access holes at their base. These need to be a minimum of 13cm in diameter (which is too small for most pets to pass through) and located every 10m.

Any trenches or pits left overnight should be covered, or a ramp put in, to avoid animals becoming trapped overnight. All existing vegetation to be retained should be appropriately fenced with tree protection fencing.

Figure 4. Log habitat pile capped with wildflower turf



4.3 Conclusions

The areas of the existing Site to be impacted comprise mostly habitats of negligible ecological value, with the exception of a few small areas that can be compensated for within the proposed planting and recommendations included in this report.

Great crested newts and grass snakes are unlikely to occur within the Site, but appropriate precautionary working methods are recommended to ensure none are harmed during the works.

In line with the NPPF (2023) the new development should aim to enhance the ecological value of the site through implementation of the enhancement measures suggested within this report.

5. References

Bat Conservation Trust (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition)

CIEEM (2017) *Guidelines for Preliminary Ecological Appraisal*, Institute of Ecology and Environmental Management. www.cieem.net

Department for Communities and Local Government (2023). *National Planning Policy Framework*

Müllner, A. (2001) Spatial patterns of migrating Great Crested Newts and Smooth Newts: The importance of the terrestrial habitat surrounding the breeding pond *RANA Sonderheft 4*

UKHab Ltd (2023). *UK Habitat Classification Version 2.0* (at <https://www.ukhab.org>)

6. Appendix 1 - Photographs



Photo 1. Swimming pool and surrounding paving



Photo 2. Tennis court looking southwest – we understand this will form the majority of the proposed footprint of the new dwelling



Photo 3. Mown and unmown lawn amenity grassland looking east from the southwest corner of the tennis court



Photo 4. Northeast hedgerow looking northwest



Photo 5. Tree line forming the northwest Site boundary



Photo 6. Southwest hedgerow with dry ditch (not visible) and modified grassland road verge to Bromley Lane



Photo 7. Large compost heap in west corner of Site, with colonizing nettles



Photo 8. Stacked paving slabs creating potential shelter for amphibians, reptiles and small mammals



Photo 9. Exterior of pool building showing no cracks or gaps around the soffit box and where the gable wall joins the roof



Photo 10. Interior roof space of the pool building showing low height (1m) roofing felt and timbers in excellent condition, affording no access or roosting features for bats

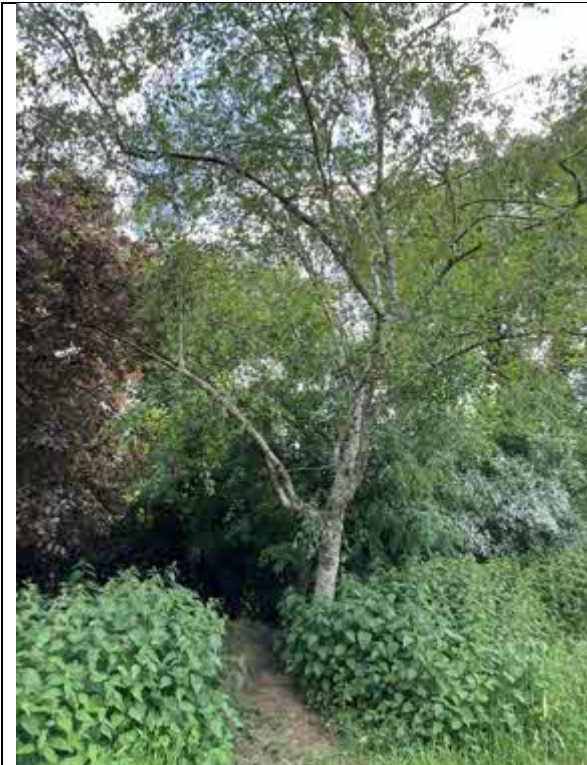


Photo 10. Early mature silver birch with small compost heap colonizing with nettles



Photo 11. Mature oak and ash trees near the proposed breach of the southwest hedgerow. Both have low bat roost potential



Photo 12. Flaking bark of the southernmost willow tree east of the pond – forming potential bat roosting feature



Photo 13. Mature pear tree south of the drive with moderate bat roost potential

7. Appendix 1 – Great crested newt eDNA survey results for samples taken from Pond 1, 55m southwest of the Site

Folio No: E18366
Report No: 1
Purchase Order: 0486
Client: DENNY ECOLOGY
Contact: Matthew Denny

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: 27/06/2023
Date Reported: 04/07/2023
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
6137	Fox & Hounds, Standon - Bromley Lane Pond	TL 4139 2135	Pass	Pass	Pass	Positive	6

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

Reported by: Chris Troth

Approved by: Jackson Young



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.

