# Northcote Hotel

# Ecological Impact Assessment

| **Document:** | **BOW17_1427 Northcote Hotel Ecological Assessment** | | | |
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| Version | Date | Prepared by | Technical Reviewer | Approved by |
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# Executive Summary

This report presents the findings of an ecological assessment including UK Habitat survey, preliminary bat roost assessment and great crested newt (GCN) environmental DNA (eDNA) survey of Northcote Hotel and surrounding grounds. The assessment was commissioned by Box Associates Ltd to inform a detailed planning application for the construction of a new pavilion restaurant, new car parking facilities including a new access road, and new roads within the grounds NGR:SD 70631 34876).

It is based on information collected from a desk study and an Extended UK Habitat Survey carried out in March 2023. Relevant legislation and planning guidance are also taken into account.

Key ecological features, potential impacts, further survey requirements and outline mitigation measures are summarised in the table below.

***Key findings and recommendations***

| **Recommendations** |
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| **Additional surveys**<br>1.1 Nesting bird checks for any vegetation removal undertaken within the breeding bird season (March-august).<br>1.2 If no works are undertaken on site within 12 months of the UKHAB survey, a pre-works site walkover to check for badgers will be undertaken a maximum of two months prior to the commencement of works. |
| **Pollution control measures**<br>2. Ensure best practice measures are applied to minimise possibility of pollution to habitats of importance. |
| **Habitats**<br>3.1. Avoid losses of native hedgerows, mature trees and woodland wherever possible – loss of mature trees cannot be simply mitigated for.<br>3.2. Compensate for any losses by improving existing hedgerows and/or creating new hedgerows and woodland.<br>3.3 Compensation for the loss of any scrub and mature trees will comprise the planting of locally sourced native tree and scrub species.<br>3.4. Safeguard retained hedgerows, woodland and trees with Root Protection Areas.<br>3.5 Creation of a new pond to compensate for pond loss.<br>3.6 Mitigation and compensation for the loss of habitat should take the form of a suitable landscaping plan (Appendix D). |
| **Bats**<br>4.1. T1, T3 and T4 if removed are all of low bat roost potential. These trees should be soft felled. Installation of bat boxes on retained trees (see Appendix D).<br>4.2. Compensate for loss of foraging and commuting habitat.<br>4.3. Design on-site lighting in accordance with the appropriate guidance. |

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| **Badger, Small Mammals, Amphibians**<br>5.1 A reasonable avoidance measure (RAMS) approach<br>5.2 Provision of natural hedgehog boxes located in quiet undisturbed areas with ground covering vegetation, preferably within the broadleaved woodland. |
| **Invertebrates**<br>6.1 Retaining wood piles and deadwood from trees to attract invertebrates and fungi. |
| **Enhancements**<br>7.1 Additional planting of scrub and scattered trees in and around the margins of the site, that is in excess of mitigation requirements, will improve the diversity of habitats. New planting should comprise native species of local provenance, to include berry bearing shrubs. Planting of such additional native species will benefit many species of wildlife including bats, birds and amphibians;<br>7.2 The creation of habitat for invertebrates by excavating small trenches, filling with suitable materials (e.g. rubble and woody debris) and covering with freely draining soils to form a low mound and sown/planted with nectar rich wildflowers/shrubs;<br>7.3 The installation of additional bat and bird boxes |

# 1. Introduction

1.1 Bowland Ecology Ltd was commissioned by Box Associates Ltd to undertake an ecological assessment of Northcote Hotel and surrounding grounds (NGR:SD 70631 34876). An GCN EDNA survey was also taken of the single pond on site. This is in relation to a detailed planning application for the construction of a pavilion restaurant, new car parking facilities including new access road and new roads within grounds.

1.2 The site comprises the original Manor and southern extension with a separate Garden Lodge to the east. The surrounding gardens comprise mown modified grassland with areas of mature scattered trees and scrub with an area of broadleaved woodland at the southern and eastern boundaries. Hedgerows and kitchen gardens intersperse the grounds with a small pond present at the centre. The wider landscape is predominantly rural comprising agricultural land with associated hedgerow, tree lines and pockets of woodland. The small village of Langho is present to the south west.

1.3 The appraisal follows the Guidelines for Preliminary Ecological Appraisal and the Guidelines for Ecological Report Writing (CIEEM 2017a; 2017b), and is in line with the British Standard BS42020:2013 'Biodiversity – Code of practice for planning and development'. It is based on information from a desk study, an Extended UK Habitat Survey, and a provisional analysis of Biodiversity Net Gain.

1.4 The aim of the appraisal is to:

1) identify designated sites and important habitats occurring within the area;

2) identify the presence of or potential for important species, including legally protected species; and

3) assess likely impacts and recommend suitable mitigation measures and opportunities for Biodiversity Net Gain.

1.5 The report includes a description of the methods used, habitats and species identified, and recommendations to protect and enhance biodiversity and address legal requirements.

# 2. Methodology

***Desk Study***

2.1 The aim of the desk study was to identify the presence of statutory and non-statutory designated wildlife sites, legally protected species, and Habitats and Species of Principal Importance (HPI & SPI) for the conservation of biodiversity (Section 41 NERC Act 2006) within the search area.

2.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed for information on locally, nationally and internationally designated sites of nature conservation importance (statutory sites only) and areas identified as HPI within 1 km of the site boundary. A 1 km search area was considered appropriate due to the small scale and localised nature of the works. The MAGIC website was also searched for records of nearby granted European Protected Species (EPS) mitigation licences for bats and great crested newts.

2.3 Local records of protected sites and species within 1 km of the site were obtained from a data search with Lancashire Environmental Records Network (LERN).

2.4 Ordnance Survey (OS) maps and aerial photographs were reviewed to help identify the presence of water bodies and notable habitats, such as hedgerows and woodland, within 0.25 km of the site, which may provide aquatic or terrestrial habitat for GCN.

2.5 It is recommended[1] that, for developments resulting in permanent or temporary habitat loss at distances over 0.25 km from the nearest pond, careful consideration should be given as to whether a great crested newt survey is appropriate. Although this species may use suitable terrestrial habitat up to 0.5 km from a breeding pond, in this instance a 0.25 km search radius was considered appropriate due to the small scale and localised nature of the works.

***UK Habitat Classification Survey (UKHab)***

2.6 An assessment was made of all areas of vegetation within the site boundaries, based on the standardised UKHab survey methodology (Butcher et al. 2020a). This involved a walkover survey to identify vegetation types, which were then classified against those types set out in UKHab classification system (Butcher et al. 2020b). All habitats within and adjacent to the site boundary were mapped and described.

2.7 In addition, evidence of and potential for legally protected and notable species was noted, in particular:

- Potential roosting sites for bats within trees and buildings (identification of suitable cracks and crevices - survey undertaken externally and from ground level only); an assessment of the suitability of bat roosting, foraging and commuting habitat was undertaken based on Collins (2016) (see Appendix A);

- Habitats utilised by other notable and protected species, including amphibians (particularly great crested newt *Triturus cristatus*), water vole (*Arvicola amphibius*), otter (*Lutra lutra*), badger (*Meles meles*), hedgehog (*Erinaceus europaeus*),

[1] see the Natural England 'Method statement template for great crested newt mitigation licence', https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence

invertebrates (e.g. butterflies), nesting birds (including any active or disused bird nests) and reptiles; and

- The presence of the most common invasive plant species subject to strict legal control including: Japanese knotweed (Fallopia japonica), giant knotweed (F. sachalinensis), hybrid knotweed (F. x bohemica), giant hogweed (Heracleum mantegazzianum), rhododendron (Rhododendron ponticum, R. ponticum x R. maximum and R. luteum), and Himalayan balsam (Impatiens glandulifera).

2.8 The survey was carried out by Helena Davis BSc (Hons) on 21st March 2023. The weather was cool (cloud cover 75%), approximately 10°C with intermittent rain and a south westerly moderate breeze (Beaufort scale 4).

***eDNA Survey***

2.9 eDNA analysis of water collected from the pond on site (see Appendix C) was undertaken to determine the presence of GCN. Sampling methods followed those outlined in Biggs et al. (2015). Pond water samples were taken on the 18th April 2023 by Sam Robinson BSc (Hons), QCIEEM and Luke Hall BSc (Hons), QCIEEM and sent to SureScreen Diagnostics, a Natural England approved laboratory for eDNA analysis to determine the presence/absence of GCN. The weather during the survey was dry, 3/8 cloud cover, light breeze (Beaufort scale 2) with an approximate temperature of 12°C.

***Limitations***

2.10 The habitat survey focused on the most prominent and important species within the time available, rather than aiming to identify all species that might present within site. Ecological surveys are also limited by factors that affect the presence of plants and animals, such as the time of year, migration patterns and behaviour. Therefore, the survey of the study area has not produced a complete list of plants and animals.

2.11 Desk study data should not be treated as a comprehensive list of species present within a search area. Habitat inventories shown on MAGIC vary in terms of their completeness, precision and reliability. Many species are under-recorded and low numbers of records can indicate a lack of survey effort in some areas, rather than confirm the absence of a species.

2.12 The timing of the survey was outside the optimum period for completing a UK Habitat Survey (April to September inclusive; JNCC 2010). However, the site was fully accessible, and there was sufficient information to confidently recognise the type of habitats present and their potential to support legally protected species.

2.13 The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The Extended UK Habitat Survey checked, in particular, for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, rhododendron and Himalayan balsam. There may be other invasive plant species present on the site which were not recorded, but it is considered that the survey was sufficient to identify any significant constraints posed by invasive plants.

# 3. Results

***Desk Study***

3.1 The desk study identified no statutory or non-statutory designated wildlife sites within 1 km of the site boundary.

3.2 It also identified 14 areas of deciduous woodland within 1 km of the site which potentially qualify as HPI, the closest of which is located within the site at the eastern boundary.

3.3 Numerous hedgerows are present within the site with three considered to be HPI.

3.4 A single pond is present within the site. Two further ponds are present within 0.25 km of the site, located approximately 75m and 172m southwest, south of the A59 which is considered a significant barrier to the dispersal of GCN that may be present in the area, therefore these two ponds were scoped from further survey.

***Habitats***

3.5 The location of habitats recorded during the Extended UK Habitat Survey is mapped in Appendix B. The Target Notes (TNs) describing each habitat and key interest features for wildlife are set out in Appendix C. Each primary habitat type and condition assessment is described below, with subheadings detailing the primary and/or secondary codes. Plant species nomenclature follows Stace (2010).

<u>Modified Grassland (g4)</u>

3.6 Approximately 50% of the site comprises modified grassland. The northern section, beyond the red line boundary, is less managed with a sward height of 10cm with wetter mossy areas. Species include Yorkshire fog (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), dandelion (*Taraxacum officinale* agg.), wood dock (*Rumex sanguineus*), common nettle (*Urtica dioica),* garlic mustard (*Alliaria petiolata*), cleavers (*Galium aparine*) and marsh thistle (*Cirsium palustre*). The grassland is considered to be in 'good' condition.

3.7 The central section surrounding amenity areas and buildings is mown frequently. Species composition is similar to the above with daffodil sp. (*Narcissus*), snowdrop (*Galanthus nivalis*) and *Crocus* planted to the west along the tree line. The grassland is considered to be in 'poor' condition.

<u>Broadleaved Woodland (w1g)</u>

3.8 Two separate areas of young broadleaved woodland plantation are present on site. The largest is located at the eastern and southern boundaries; here the canopy comprises of alder (*Alnus glutinosa*), oak (*Quercus* sp.), ash (*Fraxinus excelsior*) and silver birch (*Betula pendula*). Towards the south the trees are mostly semi-mature with younger trees to the north. The understorey comprises ivy (*Hedera* sp.) and bramble (*Rubus fruticosus*) with occasionally dog wood (*Cornus sanguinea*). Ground cover includes modified grassland with lesser celandine (*Ranunculus ficaria*), nettle, pendulous sedge (*Carex pendula*) and willowherb (*Epilobium* sp.). Regeneration is evident in the form of oak saplings. The woodland is considered to be in 'moderate' condition.

3.9 A smaller patch of woodland situated in a depression is present near the western boundary. The area was particularly wet at the time of survey due to recent rainfall but will likely hold

water regularly. The canopy comprises of silver birch, *Prunus* sp. and willow sp. (*Salix*). The understorey is predominantly bramble. Ground flora includes lords and ladies (*Arum maculatum*), willowherb, nettle, cleavers, Yorkshire fog and a small amount of brash. The woodland is considered to be in 'poor' condition.

Dense Dogwood Scrub (h3)

3.10 Two dense patches of dogwood scrub are present adjacent to the hedgerow at the western boundary and 30m east within the modified grassland (mapped as mixed scrub in Appendix C as there is no code for dogwood scrub).

Scattered Trees

3.11 Two linear lines of planted fruit trees and shrubs comprising raspberry (*Rubus idaeus*) and wild cherry (*Prunus avium*) are present within the managed grassland at the centre of the grounds.

3.12 Other scattered semi-mature to mature trees present within the grounds include silver birch, pear (*Pira* sp.), quince (*Cotoneum malum*/*Cydonium malum*), medlar (*Mespilus germanica*) beech, sycamore (*Acer pseudoplatanus*), willow (*Salix* sp.) and horse chestnut (*Aesculus hippocastanum*).

Hedgerow

3.13 Six hedgerows are present within or surrounding the grounds. Descriptions of the hedgerows, condition results and whether the hedgerow is considered priority habitat is given in Table 1 below. Any ornamental privet hedgerows (except H3) with a lack of ground cover are not included in the table but are present on the UK HAB plan (Appendix C) listed as 'Other hedgerows'.

**Table 1. Hedgerow descriptions**

| Hedgerow No. | Description | Condition Assessment | Priority habitat |
|---|---|---|---|
| H1 | A small beech (*Fagus sylvatica*) hedgerow which borders the southern boundary of the modified grassland in the centre of the grounds. The hedgerow is approximately 7m long (with a 2m gap), 0.5m wide and 0.5m tall. The hedgerow is managed with limited ground flora aside from occasional dandelion. | Poor | No |
| H2 | A holly (*Ilex aquifolium*) hedgerow runs parallel to H1. The hedgerow is managed, approximately 0.5m wide, 0.5m tall and 13m in length. | Poor | No |
| H3 | A privet hedgerow runs perpendicular to H2. The hedgerow is approximately 29m length, 2m wide and 1.5m tall with no ground flora present. | Poor | No |
| H4 Hedgerow with Trees | A predominantly blackthorn and hazel hedgerow borders the grounds to the west, adjacent to Northcote road. Other species include occasional privet, beech and ivy. The hedgerow is approximately 195m in length, 1.5m high and 1m wide. The hedgerow appears lightly managed with a ground flora comprising lords and ladies (*Arum maculatum*), nettle and ground elder (*Aegopodium podagraria*). | Moderate | Yes |
| H5 | A blackthorn and rose (*Rosa* sp.) hedgerow is present between the pond and the eastern broadleaved | Moderate | Yes |

| | | | |
|---|---|---|---|
| | woodland. The hedgerow is approximately 40m in length, 2m tall and 0.5m wide. The ground flora is similar in composition to the unmanaged modified grassland. | | |
| H6 | A wild plum (*Prunus domestica*), raspberry and rose hedgerow runs parallel to H5, approximately 30m to the south. The hedgerow is approximately 30m length, 2m tall and 0.5m wide. | Moderate | Yes |

Line of Trees (w1g6)

3.14 A line of mature beech, sycamore and horse chestnut trees runs parallel and perpendicular (west to east adjacent to a dry stone wall) to H4 . Ground flora includes lords and ladies, wood avens (*Geum urbanum*), dovesfoot cranesbill (*Gernanium molle*), Yorkshire fog (*Holcus lanatus*), garlic mustard (*Alliaria petiolata*), cow parsley (*Anthriscus sylvestris*) and planted daffodil and iris.

Horticulture (Vegetable garden c1f)

3.15 A kitchen garden with vegetable beds and small shed is adjacent to the line of trees.

Other

3.16 Bamboo (*Fargesia* sp) and ground planters with ornamental species are present within the managed grassland areas, interspersed with ornamental privet (*Ligustrum* sp.) hedgerows.

3.17 A dry stone wall is present at TN4, adjacent to the tree line. The wall is collapsing in places.

3.18 A pile of brash from felled/fallen tree branches is present within the modified grassland at TN6.

3.19 Approximately a quarter of the grounds contains developed land sealed surface located at the south western corner comprising the staff and guest car parks.

***Species***

Bats

3.20 The data search returned no records for bats and the search of MAGIC identified no bat EPS licences within 1km of the site boundary.

*Roosting bats*

3.21 Four trees within the grounds were assessed as providing potential to support roosting bats. Table 2 provides a description of Potential Roosting Features (PRF), photographs and bat roost suitability category for each tree assessed as providing suitable roosting habitat for bats. Appendix C provides a plan showing the location of the trees.

**Table 2**: Potential Bat Roosting Features (PRF) and photographs.

| Description | Photograph | Roost Suitability |
|---|---|---|
| **T1:** A mature crack willow (*Salix x fragilis*) with lifted bark located within the small area of woodland approximately 10m from the western boundary. |  | Low |
| **T2:** A mature horse chestnut located at the southern section of the site with the tree line, adjacent to the western boundary. A knothole is present facing east. |  | Low |
| **T3:** A mature oak located at the western boundary, adjacent to the field gate. A knothole is present facing south.<br><br>(Image taken from google street view Northcote Rd - Google Maps) |  | Low |
| **T4:** A mature ash with possible early signs of ash die back disease. The tree is ivy cladded.<br><br>(Image taken from google street view Northcote Rd - Google Maps) |  | Low |

3.22 The Manor House on site is generally well sealed providing limited opportunities for roosting bats. Potential external roosting features (PRFs) identified include two lifted/missing slate tiles on the northern elevation providing potential bat access beneath with two further potential gaps behind the wooden soffit board at the same elevation.

3.23 Internally, the loft space of the manor house is used for office space and storage. The two rooms are warm, dry and well lit. Wooden beams are present with felt lining lifting away in places. However, no light ingress or bat access points were identified internally. A wasp nest and other insects were identified during the survey, however no evidence of bats was observed. In accordance with Bat Conservation Trust guidance (Collins, 2016 – Appendix A), the manor house was concluded to possess '**low**' potential value for roosting bats. For full descriptions and photograph of PRFs see Appendix E.

3.24 Garden Lodge, outbuilding and brick building within the vegetable garden are well sealed and no PRF's were identified. In accordance with Bat Conservation Trust guidance, the buildings were concluded to possess '**negligible**' potential value for roosting bats.

*Foraging bats*

3.25 The habitats on site such as hedgerow, tree lines, woodland, scrub, scattered trees, open water and unmanaged grassland provide optimal foraging and commuting features for a range of species, namely those preferring edge habitats such as common pipistrelle, along with noctule (*Nyctalus noctula*) which select relatively open foraging grounds. In addition, the woodland provides optimal habitat for species preferring a closed setting such as brown long eared bats (*Plecotus auritus*), therefore this species may also utilise the scrub, tree lines and woodland edge habitat along the southern and eastern boundaries.

Badgers

3.26 The data search returned a single record for badger within 1km of the site. The record is for a deceased adult located adjacent to the A59, approximately 930m west of the site. The record is dated 2017. No evidence of badger in the form of setts, latrines, footprints or hairs was recorded on site during the survey. Habitats on site considered suitable for badger sett excavating and foraging includes areas of broad-leaved woodland, scrub and hedgerow.

Birds

3.27 The data search returned 13 records for species listed under Section 41 of the NERC Act (2006) and Birds of Conservation Concern 4 (BoCC4) including starling (*Sturnus vulgaris*), lapwing (*Vanellus vanellus*), curlew (*Numenius arquata*) and grey partridge (*Perdix perdix*) from the 1km search area. The closest records are for curlew, lapwing and grey partridge located approximately 300m north east of the site, the less managed grassland to the north of the red line boundary and hedgerows could provide potential breeding habitat for the above species. However the high levels of disturbance from visitors, traffic and external lighting renders the area less suitable, ground nesting birds are therefore not considered further within this report. Woodland, trees, treelines, hedgerow and scrub on site provide breeding habitat for starling and other tree nesting birds.

3.28 At the time of survey, a nest was present within the woodland closest to the western boundary, a large pile of bird droppings was present on the ground at the northern elevation of the Manor House (TN1), owing to a possible bird nest within the wooden soffits above with another nest identified in H6. It is not known if any were active at the time of survey.

Other mammals (European hedgehog)

3.29 The data search returned several records of hedgehog (*Erinaceus europaeus*) within the search radius. The closest was of a juvenile located approximately 140m south east of the grounds. Broadleaved woodland, scattered trees/tree lines, scrub, hedgerows, brash pile, dry stone wall together with the areas of modified grassland within the grounds provide suitable sheltering, foraging and hibernating habitat for small mammals, including hedgehog (*Lepus europaeus*), a Species of Principal Importance (SPI) which is likely to be present in the area.

Amphibians

3.30 The data search returned two records of common toad (*Bufo bufo*) an SPI within the search area. The closest of which is located 1km south east of the grounds. The record is dated 2020. The data search also returned several records of GCN, however all were outside of the 1km search area (circa 1.5 to 2km). The records are located to the north of the grounds, north of Old Langho Rd, which is considered a dispersal barrier. The records are dated 2017. The MAGIC website returned no granted European Protected Species licences for GCN within 1 km of the site. Table 3 provides a habitat description and photograph of the pond on site and a detailed score for the HSI assessment for GCN. The location of the pond is presented in Appendix C.

**Table 3**: Habitat description, photograph and habitat suitability assessment

| Pond | Description | Photograph |
|---|---|---|
| 1 | Medium sized, fenced pond located within the centre of the grounds within modified grassland. The pond is approximately 60m2, 50cm deep and silty with steep earth branks. Submerged vegetation includes starwort (*Callitriche stagnalis*), *Glyceria* and bullrush (*Typha latifolia*). Marginal vegetation includes willowherb (*Epilobium*), reed canary grass (*Phalaris arundinacea*). Two semi-mature weeping willow (*Salix babylonica*) trees are present to the west, which slightly shade the pond (40%). The pond is considered to be in 'good' condition. |  |

| Pond Ref | SI1 Location | SI2 - Pond area | SI3 - Pond drying | SI4 - Water quality | SI5 – Shade | SI6 - Fowl | SI7 - Fish | SI8 - Pond | SI9 - Terr'l habitat | SI10 - Macrophytes | HSI Score | Pond Suitability |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | 1 | 0.1 | 1 | 0.67 | 1 | 0.1 | 0.67 | 0.55 | 1 | 1 | 0.69 | **Average** |

3.31 The pond was subject to an eDNA survey which returned a **negative** result for the presence of GCN eDNA (see Appendix H). Due to the negative eDNA survey of the pond, it is considered highly unlikely that GCN are present on or within 0.25 km of the site.

3.32 Common amphibians, including common frog (*Rana temporaria*) and common toad, are less restricted in their habitat requirements; therefore the presence of these species on site cannot be ruled out. The woodlands, scrub, line of trees (root systems), hedgerows, brash pile, dry stone wall and unmanaged modified grassland present on site are considered to provide suitable terrestrial habitats for foraging, sheltering and/or hibernating common amphibians.

Reptiles

3.33 The data search returned no records for reptiles within the search area and it is considered unlikely that reptiles will be present within the grounds due to proximity to busy roads, intensively farmed arable land and intensively managed amenity grasslands. They are therefore not considered further within this report.

Invertebrates

3.34 No Invertebrates were returned from the data search. However, invertebrates are severely under recorded; the lack of records does not indicate a lack of invertebrate presence in the area or within the grounds. The grounds provides abundant suitable habitat for a diverse range of species, particularly arboreal species, along with pollinating species favouring open habitats.

Invasive Non-Native Species (INNS)

3.35 A small stand of cotoneaster is present within the vegetated garden at TN2. Certain species of cotoneaster are listed as Schedule 9 invasive species; identifying cotoneaster to species level is difficult, therefore as a precaution, it is advised that the species recorded on site is treated as being listed on Schedule 9.

3.36 A stand of rhododendron, also a Schedule 9 invasive species, is located just north of TN2 within an area of modified grassland.

# 4. Evaluation and Assessment of Constraints

4.1 An assessment of potential impacts on (constraints) designated sites, habitats and species is presented below. This is based on the information available on the proposed development (see below) and the professional judgement of the ecologists that prepared this report. It considers legal requirements (see Appendix G) and relevant national and local planning policies. If the proposals are changed significantly, the assessment will need to be reviewed.

***Development Proposals***

4.2 The proposed development includes the construction of a new pavilion restaurant, new car parking facilities including a new access road, new roads within the grounds and internal reconfiguration of the Manor House. It is anticipated that broadleaved plantation woodland, hedgerows (including HPI), scattered trees, tree line, the pond, scrub and modified grassland will be removed/and or impacted to facilitate the development.

***Habitats of Principal Importance***

4.3 Three hedgerows (H4 – H6) have been identified within the site as Habitats of Principal Importance (HPI). The development should therefore be designed to avoid impacting HPI and hedgerow wherever possible. Unavoidable losses will require specific compensation.

4.4 The hedgerows are also vulnerable to indirect degradation during the clearance and construction process, such as dust and chemical pollution, along with root compaction and/or damage.

***Other Habitats***

<u>Broadleaved Woodland, Mature Trees and Line of Trees</u>

4.5 The Magic website identified the potential presence of HPI woodland on the site. Following the UKHab survey, the woodland areas do not meet the criteria for HPI Lowland Mixed Deciduous Woodland due to their lack of diverse ground flora and young age of trees. The composition of the woodlands and youth of the trees fit the criteria of plantation woodland. A search of Google Earth shows these areas as modified grassland with small pockets of scrub in 2000.

4.6 However, areas of broadleaved plantation woodland, scattered mature trees and the line of trees form valuable wildlife habitat. Losses should be avoided, particularly areas with mature native trees and the line of trees which appears more semi-natural in character. Where losses are planned, these will require suitable compensation.

4.7 Dense scrub is still considered to be of good ecological value, providing habitat connectivity and provision of foraging, sheltering and nesting opportunities to a range of species. Therefore, reduction of this habitat would result in a negative ecological impact. The woodland, tree line and scattered trees could also be impacted by indirect pressures described in paragraph 4.4 above.

<u>Pond</u>

4.8 The pond on site returned a negative result for the presence of GCN eDNA; however, the pond is considered to provide suitable habitat for other amphibian species. It also provides ecological value through foraging opportunities for bats, birds and mammals, along with

habitat for aquatic invertebrates. The loss of the pond is considered to result in negative ecological impact.

Modified Grassland

4.9 The grounds support a large area of modified grassland. This habitat is species poor, offers little ecological value and is commonly occurring within the surrounding area.

***Species***

Bats

4.10 If works or disturbance to the trees assessed as having potential to support roosting bats is required, there is a risk of injury/killing/disturbance which may result in an offence (see Appendix A). In the absence of compensation, any loss of woodland, trees, tree lines, grassland, scrub and the pond would result in a reduction of foraging and commuting habitat for bats. The use of artificial lighting has the potential to impact foraging or commuting bats by illuminating foraging habitat, deterring them from using certain areas or preventing their movement through the wider landscape.

4.11 The external PRF's (lifted roof tiles and gaps behind wooden soffit boards on the northern elevation) on the Manor House provide habitat suitable for small numbers of opportunistic summer roosts, of crevice dwelling species such as common pipistrelle. As works to the Manor House are internal reconfiguration works and no impacts are anticipated to outside walls or the roof of the property, no impacts to roosting bats, if present are anticipated. Therefore, no further survey is required.

Badgers and Other Small Mammals

4.12 The site provides suitable habitat for badgers and other small mammals, including hedgehog. This particularly applies to the site boundaries and hedgerows within the site. European hedgehog (*Erinaceus europaeus*) are likely present within the grounds and desk study records of badger and hedgehog were found within 1 km.

4.13 Potential impacts to these species during site clearance and construction including disturbance/harm of individuals (if works are undertaken without due care and attention) and entrapment within excavations (if these are left uncovered overnight as animals may fall into them). The development is not anticipated to pose any significant barriers to the dispersal of mammals, but will likely result in a loss of foraging and refuge habitats.

Birds

4.14 Any removal or disturbance to woodland, hedgerow, trees, scrub and the dry stone wall has the potential to impact nesting birds if undertaken within the nesting bird season (March to August inclusive) and/or without due care and attention. This would constitute an offence (see Appendix A).In the absence of compensation, any loss of trees, buildings or scrub would result in a reduction of nesting and foraging habitat for birds.

Amphibians

4.15 The site provides suitable habitat for common amphibians in the form of woodland, scrub, tree lines, scattered trees, hedgerows, brash pile, dry stone wall and the pond. If present in the local area, accidental disturbance and/or harm could occur to the aforementioned species if site clearance and construction works are undertaken without due care and attention. Works may also result in the accidental entrapment of individuals within excavations if works are completed in the absence of suitable mitigation. Works should therefore be designed to avoid

loss of these habitats. If loss is unavoidable, the impacts must be minimised with adequate mitigation.

4.16 Although the pond scored 'average' suitability for GCN, given the negative eDNA result, it is considered highly unlikely that GCN are present on or within 0.25 km of the site. As such, it is considered proportionate for the works to be undertaken under Reasonable Avoidance Measures (RAMS). The loss of the pond will result in the loss of potential common amphibian breeding habitat.

Invertebrates

4.17 The site provides potential habitat for a diverse assemblage of invertebrate species. Unmitigated, removal of suitable habitats on site would result in a loss of invertebrate habitat.

Invasive Non-Native Species (INNS)

4.18 Cotoneaster and rhododendron are listed on Schedule 9 of the Wildlife and Countryside Act (1981, as amended). This makes it illegal to plant or otherwise cause the species to grow in the wild. Works undertaken without due care and attention in respect of the aforementioned species could cause the spread of non-native species in the wild and thereby lead to an offence (see Appendix A). Conversely, the development also provides an opportunity to eradicate the species from the site which would prevent its spread into surrounding habitats.

# 5. Mitigation and Opportunities

5.1 The recommendations set out below aim to ensure that the proposed development takes account of important ecological features, legal requirements (see Appendix G), and relevant national and local planning policies. The National Planning Policy Framework (2021) specifically states that development should seek to minimise impacts, incorporate improvements, and provide net gains for biodiversity. If the proposals are changed significantly, the recommendations will need to be reviewed.

5.2 Mandatory biodiversity net gain, as set out in the Environment Act, applies in England only by amending the Town & Country Planning Act (TCPA); following a transition period, it is likely to become a legal requirement in 2023.

5.3 Provisions of the new Environment Act 2020 aim to ensure that developers leave wildlife habitats in a measurably better condition than they were before development started.

***Habitats (including HPI)***

Pollution Prevention

5.4 To avoid indirect impacts to HPI appropriate pollution control and prevention measures will be applied throughout the clearance and construction period to ensure hedgerows are not negatively affected during the works through run-off and dust created during site clearance and construction. The Scottish Environmental Protection Agency (SEPA) and Northern Ireland Environment Agency (NIEA) have published guidance on the NetRegs website (NetRegs, 2018). In the absence of any guidance in England it is advised that the information published on the NetRegs website is adhered to during the works. The information provided is considered recognised good practice and the most up to date guidance currently provided. Examples of suitable mitigation that will be adopted during site clearance and construction includes;

- Maintaining high standards of housekeeping;
- Enforcing speed limits on site;
- Dampening down working areas and haul roads in dry periods to prevent dust;
- Using covered wagons and skips;
- Keeping roads clean with the use of road sweepers; and
- Appropriate secure storage and use of fine materials, such as cement powder.

Root Protection Areas

5.5 In line with BS 5837:2012 (Trees in Relation to Design, Demolition and Construction), Root Protection Areas (RPAs) should be installed to protect trees and hedgerow, using vertical barriers or appropriate ground protection to create exclusion zones prior to commencement of works.

5.6 It is recommended that tree protection fencing is positioned at least 15m from areas of retained woodland on the site. No vehicles or heavy machinery shall enter into this woodland protection area.

Hedgerow, Broadleaved Woodland Plantation and Trees

5.7 The loss/reduction of hedgerow and woodland should be avoided wherever possible. If avoidance is not possible, the final proposal design should aim to minimise the loss of these habitats.

5.8 Broadleaved woodland and semi-mature - mature trees throughout the site should be retained where possible and adequately protected throughout the construction phase of the development in accordance with paragraph 5.5, 5.6. and 5.18 (light pollution measures). Current proposals show a western strip of the woodland plantation will be removed to facilitate an access road behind the Garden House, adequate compensation will be required, creating new areas of woodland and planting replacement trees, preferably to the north of the site, linking to retained areas of woodland (see Appendix D).

5.9 Current landscaping plans are removing a small section of the hedgerow HPI (H4) at the western boundary to widen the existing access. As there is already a gap and gate present to provide field access, it is anticipated that extending this gap marginally will not impact the overall integrity of the hedgerow, however removal should be kept to a minimum. The removal will offer opportunity for the development to incorporate improvements as stated within the National Planning Policy Framework. The condition of the HPI may be increased through the following measures:

- Extending the hedgerow around the site perimeter, especially the northern boundary with a diverse range of native berry/fruit bearing species such as hazel, oak, hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), wayfaring tree (*Virburnum lantana*), spindle (*Euonymus europaeus*), and crab apple (*Malus sylvestris*);
- Further planting of thorny species such as hawthorn, blackthorn, and dog rose (*Rosa canina*) which will also improve site security;
- Incorporating an appropriate management regime to retain and increase hedgerow width.
- Including night scented species such as honey suckle (*Lonicera periclymenum*) which will attract bat prey (moths).

5.10 If any other hedgerows on site are to be impacted by the works (current landscaping plans show that H5 HPI may be impacted to incorporate a track) the hedgerow will be replaced on a like for like basis and of better ecological value (more species rich) if removed or improved with the measures listed in paragraph 5.9 if partially impacted.

5.11 Compensation for the loss of any scrub and mature trees will comprise the planting of locally sourced native tree and scrub species. The species planted will comprise native species appropriate to the locality and of local provenance where possible. New trees will be planted at a minimum ratio of **two** trees for every **one** lost.

<u>Pond</u>

5.12 In the first instance, it is recommended that the pond is retained. If this is not possible, a creation of one new pond, with associated areas of marginal vegetation will be implemented. Ideally, the new pond should be approximately 8m long and have a maximum depth of 1.5 – 2 m.

5.13 The banks of the pond should be gently sloping to allow for safe egress of amphibians and other animals; form existing ground level sloping towards the centre, where the depth will be 1.5 - 2 m. Pond margins will be planted with established large plug plants of native species, such as; yellow-flag iris (*Iris pseudacorus*), water forget-me-not (*Myosotis scorpioides*), water mint (*Mentha aquatica*) and water plantain (*Alisma plantagoaquatica*). This will allow for rapid establishment and provide suitable cover and egg laying substrate for amphibians. See Appendix D for the proposed pond location.

Modified grassland

5.14 To mitigate for the loss of grassland, native species-rich wildflower seeding will be undertaken in proposed landscaping areas of retained grassland (see Appendix D). A less intensive management/mowing regime of grassland areas within the completed development will also be implemented to allow grassland species to flower and seed, which will further increase the biodiversity value of the site. The wildflower areas will be cut twice a year, once in late June/July and once again in Autumn (September).

***Species***

Bats

*Roosting bats – trees*

5.15 Any trees assessed as having low roosting potential to support roosting bats which are to be impacted by the proposed works will be soft felled (to include careful dismantling and rigging) to avoid impacts to roosting bats. The following measures will be adhered to during the felling process;

- The tree will be felled in sections and high risk limbs/trunk sections carefully lowered to the ground. If any obvious cracks, holes, crevices etc. are evident, the limb will be cut as far away from these features as possible; and
- Any removed tree limbs/trunks will be left on site for 24 hours to allow any bats roosting within crevices to escape.

5.16 It is anticipated that T1, T3 and T4 may be lost to facilitate the works. Compensation will comprise the installation of three 1FF Schwegler bat boxes on retained trees (see Appendix D). The box will be orientated in a south-easterly/south-westerly direction (north-facing positions will be avoided). The boxes will be positioned at a height of between 4 to 6 metres in an open sunny position, sheltered from strong winds. The box must have a clear flight path, with no obstructions such as branches and will be placed in an unlit location, away from external lights, with connectivity to foraging habitats. Note that once bats have inhabited a roost site they may only be disturbed by licensed bat workers.

*Commuting and Foraging*

5.17 Impacts to bats as a result of the loss of foraging and commuting habitat is considered to be moderate due to the removal of a small section of broadleaved woodland, scattered trees, scrub and the pond. The planting of scrub and scattered trees, along with the creation of a new pond, as recommended above, will ensure the continuation of foraging and commuting opportunities for bats within the area.

5.18 A sensitive lighting scheme will be incorporated into the proposals, in accordance with the appropriate guidance (IPL 2018). The lighting scheme will be adopted during site clearance and construction and will also cover the completed development. Examples of low impact lighting schemes include, but are not limited to:

- Use of sodium lighting or LED lights with a warm colour temperature (<2700 Kelvin) instead of mercury or metal halide lamps;
- Careful direction/positioning of lighting to where it is needed and to avoid light spillage onto high value bat roosting/foraging habitats (i.e. woodland, scrub, tree line, hedgerow and pond);
- Only working during daylight hours; and
- Turning off any additional site lighting at night or using motion sensors within the active bat season.

Badger, Small Mammals, Amphibians

5.19 Adherence to the following RAMs will eliminate the potential for impacts to badger, small mammals (including hedgehog) and amphibians should they be present on site:

- Before works commence, all contractors will be made aware of the potential for mammals and amphibians to utilise suitable habitats on site and to be encountered during the works, and the procedure to follow if these are encountered during works (see Appendix F);
- In the unlikely event that GCN are encountered during the works (see Appendix F), all works must cease immediately and the project ecologist will provide further advice;
- If no works are undertaken on site within 12 months of the UK Habitat survey, a pre-works site walkover to check for badgers will be undertaken a maximum of two months prior to the commencement of works by a suitably qualified ecologist;
- The working footprint will be kept to a minimum;
- No night work or floodlighting (working window: an hour after sunrise until an hour before sunset);
- Where required, the removal of any stone walls/brash piles/dead wood will be undertaken methodically and by hand. Contractors will be made aware of the potential presence of mammals and amphibians. The brash may be used in the creation of hibernacula and refugia in locations which are to remain undisturbed during the duration of the works;
- All stored equipment/materials which may provide mammals and amphibians with suitable refugia will be stored on hard standing/bare ground, or alternatively raised off the ground on pallets;
- Any stockpiled soils or other material will be stored in such a way that does not create potential refugia for mammals and amphibians (i.e. on hard standing/raised off the ground and well compacted to ensure no suitable cavities are created);
- Any trenches or other excavations associated with the works will be backfilled and well compacted, or covered before nightfall to prevent species becoming trapped within them. If trenches/excavations must be left open, a means of escape, such as an egress board must be provided. Excavations will be carefully inspected in the morning prior to commencement of works;
- Any small mammals or amphibians encountered at any time during works will be carefully relocated to a safe location, in an area away from the works which will remain undisturbed and placed within an area with plenty of vegetation cover. For example within a retained area of woodland at the east of the grounds;
- If any mammal holes are unexpectedly discovered during the works, work in that area muse cease and the project ecologist will be contacted for advice on how to proceed.

5.20 Any branches and trunks that are felled should be left within the surrounding woodland habitats, scattered around and/or stacked into piles. In addition, any brash piles/dead wood that are to be cleared will be carefully excavated/moved and re-instated in an area of woodland which will remain unaffected by the development.

5.21 The retention of areas of woodland, hedgerow, line of trees and scrub where possible, together with compensatory habitat creation and enhancement described for these habitats (if required, see above) will minimise adverse ecological impacts with respect to badger, small mammal and amphibian habitat.

5.22 In addition to the above, the following mitigation in respect of European hedgehog will also be undertaken;

- Provision of natural hedgehog boxes located in quiet undisturbed areas with ground covering vegetation, preferably against the broadleaved woodland. For example, three or four logs may be arranged to leave an appropriate sized hole for a hedgehog to nest in (big enough for the hedgehog and its nest) and covered with masses of twigs and leaves;
- Retaining wood piles from felled trees to attract invertebrates and fungi, providing a good local food source for hedgehogs and possible nesting sites (materials from site clearance could be used for this purpose).

Birds

5.23 Habitat removal (woodland, scrub, trees, hedgerows, stone wall) should be kept to a minimum and should ideally take place outside the breeding bird season, which runs from March until August inclusive, in order to prevent any impacts upon nesting birds.

5.24 Clearance of the aforementioned habitat that must be carried out within the bird breeding season will be subject to a pre-clearance bird survey carried out by a suitably experienced ecologist. No works will be carried out within at least 5 m of an identified nest (species dependant) until the young have fledged and are no longer returning to the nest site. Works will only be undertaken once the ecologist has declared the nest to be no longer in use.

5.25 Mitigation for the loss of breeding bird habitat should be implemented throughout the site through the planting of native tree, scrub and hedgerow. The provision of native berry bearing shrubs will ensure the provision of suitable foraging opportunities. The creation of the new ponds with the provision of tall marginal vegetation will also benefit water birds favouring smaller waterbodies for nesting and rearing.

Invertebrates

5.26 The incorporation of wood piles within the landscaping design in addition to the re-planting suggested previously, will compensate for the loss of invertebrate habitat. Including night scented species such as honey suckle within the hedgerow will also attract bat prey.

5.27 Deadwood will be retained on site for saproxylic invertebrate species, it should be placed along sunny habitat boundaries.

Invasive Non-Native Species (INNS)

5.28 Mechanical or chemical control of cotoneaster and rhododendron could be implemented. Mechanical control involves the excavation and removal of the entire plant (including root mass), if any part of the plant is left then it may produce new plants. Chemical control involves stump treating larger plants with suitable herbicide after cutting to prevent regrowth.

***Enhancement measures***

5.29 As designs for the site develop, an ecologist can provide site specific advice on ways to enhance the wildlife value of the final development and contribute towards a net gain in biodiversity. Simple examples of enhancement measures which could be considered and designed into the proposals include (but are not limited to):

- Additional planting of scrub and scattered trees in and around the margins of the site, that is in excess of mitigation requirements, will improve the diversity of habitats. New planting should comprise native species of local provenance, to include berry bearing shrubs. Planting of such additional native species will benefit many species of wildlife including bats, birds and amphibians;

- The creation of habitat for invertebrates by excavating small trenches, filling with suitable materials (e.g. rubble and woody debris) and covering with freely draining soils to form a low mound and sown/planted with nectar rich wildflowers/shrubs;
- The installation of additional bat and bird boxes; and
- A green roof could be incorporated into the designs of the pavilion restaurant.

***Re-survey of the Site***

5.30 If no works are undertaken on site within 18 months of this survey or if any changes to the proposals are made, a further ecological survey may be necessary (because of the mobility of animals and the potential for colonisation of the site)

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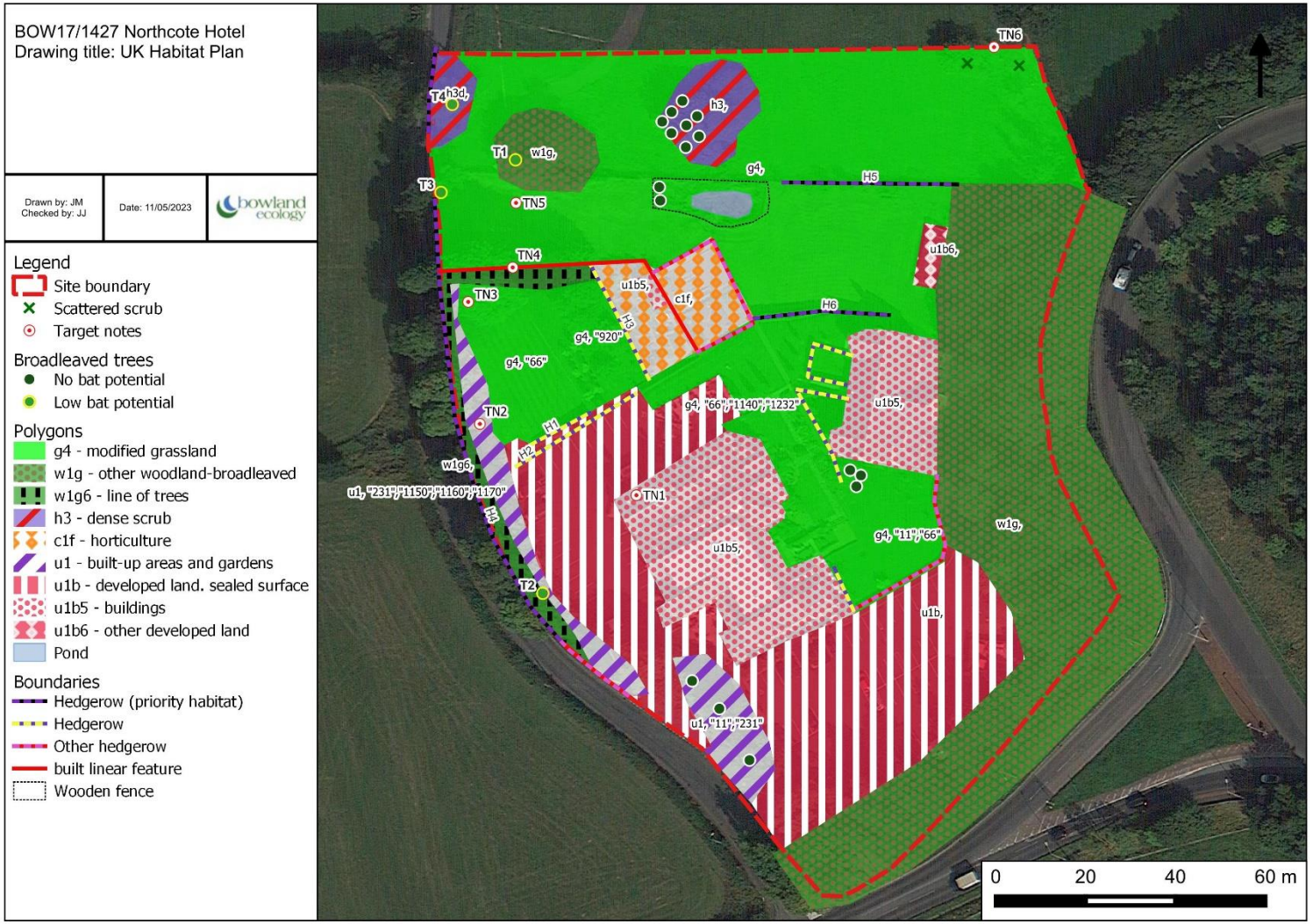
# Appendix A – Bat Roost Potential and Habitat Suitability Categories

Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Collins, 2016).

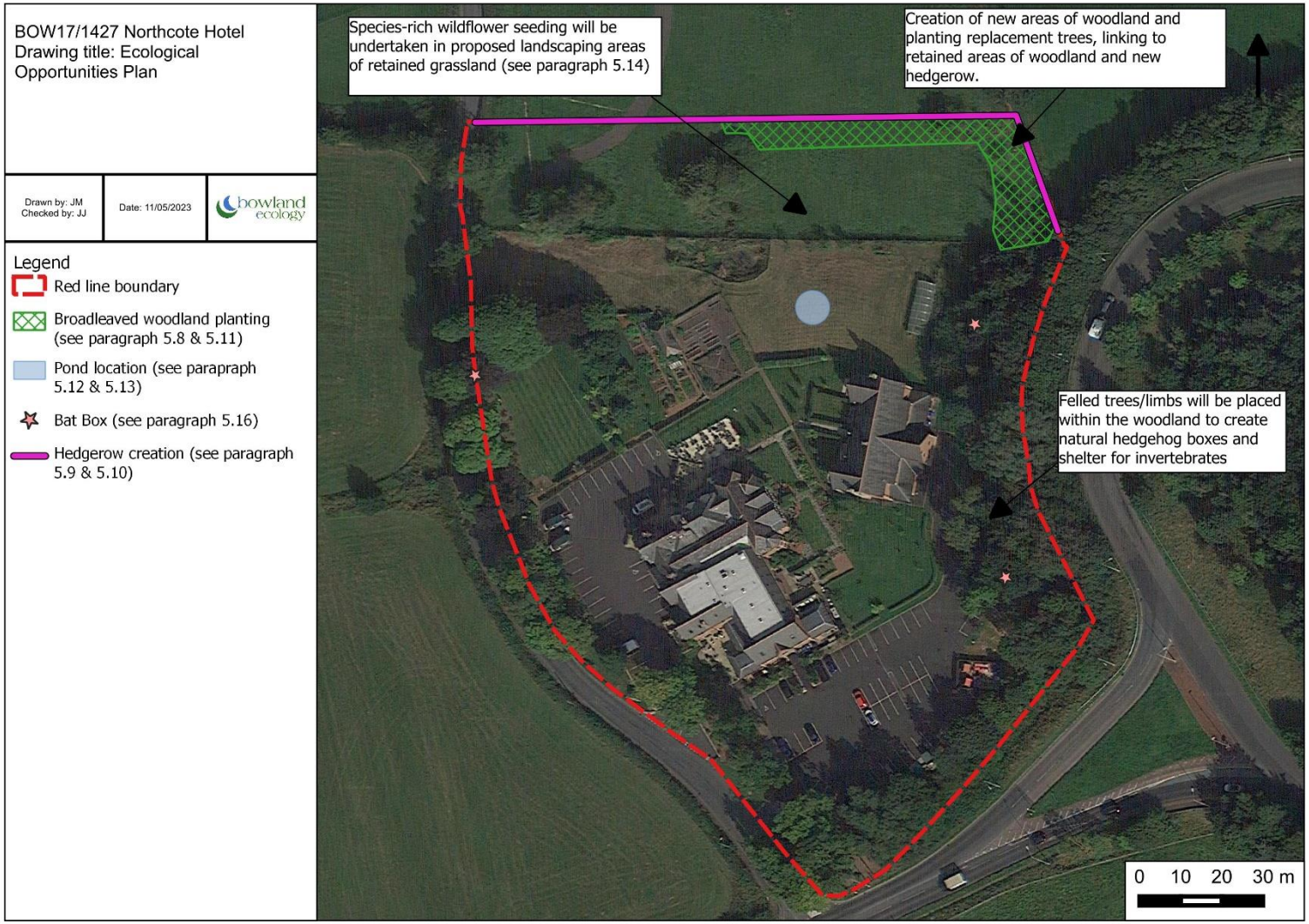
| Suitability | Description of Roosting Habitat | Commuting & Foraging Habitats |
|---|---|---|
| **Negligible** | Negligible habitat features on site likely to be used by roosting bats | Negligible habitat features on site likely to be used by commuting or foraging bats. |
| **Low** | A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitats to be used on a regular basis or by a larger number of bats (i.e. unlikely to be suitable maternity or hibernation).<br><br>A tree of sufficient size and age to contain potential roosting features but with none seen from the ground, or feature seen with only very limited roosting potential. | Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.<br><br>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub. |
| **Moderate** | A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status. | Continuous habitat connected to the wider landscape that could be used by bats for commuting, such as lines of trees and scrub or linked back gardens.<br><br>Habitat that is connected to the wider landscape that could be used by bats for foraging, such as trees, scrub, grassland or water. |
| **High** | A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. | Continuous high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.<br><br>High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland.<br><br>Site is close and connected to known roosts. |

# Appendix B – Plan of Proposed Development/Works

# Appendix C – UK Habitat Plan



# Appendix D – Ecological Opportunities Plan

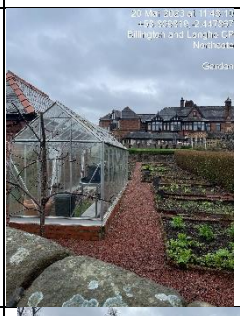


# Appendix E – Habitat Survey and Building Descriptions

See the Habitat Plan for location of each Target Note

| Primary Hab | Description | Photograph |
|---|---|---|
| Modified Grassland | Approximately 50% of the site comprises modified grassland. The northern section, beyond the red line boundary, is less managed with a sward height of 10cm with wetter mossy areas. Species include Yorkshire fog (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), dandelion (*Taraxacum officinale* agg.), wood dock (*Rumex sanguineus*), common nettle (*Urtica dioica),* garlic mustard (*Alliaria petiolata*), cleavers (*Galium aparine*) and marsh thistle (*Cirsium Palustre*). The grassland is considered to be in 'good' condition.<br><br>The central section surrounding amenity areas and buildings is mown frequently. Species composition is similar to the above with daffodil sp. (*Narcissus*), snowdrop (*Galanthus nivalis*) and *Crocus* planted to the west along the tree line. The grassland is considered to be in 'poor' condition. |  <br>  |
| Broadleaved Woodland Plantation | Two separate areas of young broadleaved woodland plantation are present on site. The largest is located at the eastern and southern boundaries; here the canopy comprises of alder (*Alnus glutinosa*), oak (*Quercus* sp.), ash (*Fraxinus excelsior*) and silver birch (*Betula pendula*). Towards the south the trees are mostly semi-mature with younger trees to the north. The understorey comprises ivy (*Hedera* sp.) and bramble (*Rubus fruticosus*) with occasionally dog wood (*Cornus sanguinea*). Ground cover includes modified grassland with lesser celandine (*Ranunculus ficaria*), nettle, pendulous sedge (*Carex pendula*) and willowherb (*Epilobium* sp.). Regeneration is evident in the form of oak saplings. The woodland is considered to be in 'moderate' condition.<br><br>A smaller patch of woodland situated in a depression is present near the western boundary. The area was particularly wet at the time of survey due to recent rainfall |  <br>  |

| | | |
|---|---|---|
| | but will likely hold water regularly. The canopy comprises of silver birch, *Prunus* sp. and willow sp (*Salix*). The understorey is predominantly bramble. Ground flora includes lords and ladies (*Arum maculatum*), willowherb, nettle, cleavers, Yorkshire fog and a small amount of brash. The woodland is considered to be in 'poor' condition. | |
| Dogwood Scrub | Two dense patches of dogwood scrub are present adjacent to the hedgerow at the western boundary and 30m east within the modified grassland (mapped as mixed scrub in Appendix C as there is no code for dogwood scrub). |  |
| Scattered Trees | Two linear lines of planted fruit trees and shrubs comprising raspberry (*Rubus idaeus*) and wild cherry (*Prunus avium*) are present within the managed grassland at the centre of the grounds.<br><br>Other scattered semi-mature to mature trees present within the grounds include silver birch, pear (*Pira* sp.), quince (*Cotoneum malum*/*Cydonium malum*), medlar (*Mespilus germanica*) beech, sycamore (*Acer pseudoplatanus*), willow (*Salix* sp.) and horse chestnut (*Aesculus hippocastanum*). |  |
| Hedgerows (See report for descriptions) | H1, H2 & 3 |  |
| | H4 (HPI) |  |

| | | |
|---|---|---|
| | H5 (HPI) |  |
| | H6 (HPI) |  |
| Line of Trees | A line of mature beech, sycamore and horse chestnut trees runs parallel and perpendicular (west to east adjacent to a dry stone wall) to H4 . Ground flora includes lords and ladies, wood avens (*Geum urbanum*), dovesfoot cranesbill (*Gernanium molle*), Yorkshire fog (*Holcus lanatus*), garlic mustard (*Alliaria petiolata*), cow parsley (*Anthriscus sylvestris*) and planted daffodil and iris. |  |
| Horticulture (Veg garden) | A kitchen garden with vegetable beds and small shed is adjacent to the line of trees. |  |
| Developed Land Sealed Surface | Approximately a quarter of the grounds contains developed land sealed surface located at the south western corner comprising the staff and guest car parks. |  |
| TN4 | A dry stone wall is adjacent to the tree line. The wall is collapsing in places. |  |

| | | |
|---|---|---|
| TN6 | A pile of brash from felled/fallen tree branches is present within the modified grassland. |  |
| Manor House | The Manor House on site is generally well sealed providing limited opportunities for roosting bats. Potential external roosting features (PRFs) identified include two lifted/missing slate tiles on the northern elevation providing potential bat access beneath with two further potential gaps behind the wooden soffit board at the same elevation.<br><br>Internally, the loft space of the manor house is used for office space and storage. The two rooms are warm, dry and well lit. Wooden beams are present with felt lining lifting away in places. However, no light ingress or bat access points were identified internally. A wasp nest and other insects were identified during the survey, however no evidence of bats was observed. In accordance with Bat Conservation Trust guidance (Collins, 2016 – Appendix A), the manor house was concluded to possess '**low**' potential value for roosting bats. For full descriptions and photograph of PRFs see Appendix E. |  <br>  <br>  |
| Garden Lodge | Garden Lodge is well sealed and no PRF's were identified. In accordance with Bat Conservation Trust guidance, the buildings were concluded to possess '**negligible**' potential value for roosting bats. |  |
| Outbuilding | The outbuilding is well sealed and no PRF's were identified. In accordance with Bat Conservation Trust guidance, the buildings were concluded to possess '**negligible**' potential value for roosting bats. |  |
| Brick Building within Veg Plot | The outbuilding is well sealed and no PRF's were identified. In accordance with Bat Conservation Trust guidance, the buildings were concluded to possess '**negligible**' potential value for roosting bats. | No photo available |

## Appendix F – Information Sheets for Contractors

# Amphibians

## Information, legal responsibilities and best practice for the construction industry

bowland ecology

### Legal Information

In England it is **illegal** to deliberately capture, injure or kill a GCN, deliberately disturb a GCN, deliberately take or destroy GCN eggs, damage or destroy a breeding site or resting place used by a GCN. Penalties on conviction: the maximum fine is £5,000, up to six months in prison, per offence and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery. The following points are defences:

- ✓ Tending/caring for a GCN solely for the purpose of restoring it to health and subsequent release.
- ✓ Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

**Good to know-**

- Newts are also carriers of the waterborne fungi- chytrid fungus. This fungus can be spread between water bodies and can cause the disease chytridiomycosis. If any work is being carried out around standing water then disinfection of footwear and equipment is important to prevent the spread of the disease.
- If a great crested newt is found before or after work (for example, pond management work) is commenced, then work should be immediately postponed and then started another time or with different methodology. If the newts cannot avoid being harmed then a license must be applied for.

### Life cycle and seasonal appearances

April-May= This is when newts undertake courtship displays and mate with females. Certain amphibians can start this process as early as February.
June-August= Larval growth and development of newly hatched juveniles- This event can occur anytime between March and October (depending on pond conditions and other factors such as climatic conditions)
August-October= Metamorphosis and juvenile emigration to terrestrial environments occurs at this stage
November-February= Hibernation on land
February-May= Emergence of adult form newts and dispersal to ponds

### Other protected amphibians

The other two species of **newts (smooth and palmate) are protected under Section 9 (5) of the Wildlife & Countryside act 1981**, which prohibits the 'sale, barter, exchange, transporting for sale and advertising to sell or to buy. Common toads and common frogs are also protected under this legislation. **The natterjack toad** (which are smaller than common toads at 6-7cm) are given **full protection** by section 9 of the same act due to the fact they are a threatened and rare species in the UK, being confined to only a couple coastal territories. It is an offence to 'intentionally kill. Injure or take (capture. etc); possession; intentional disturbance whilst occupying a 'place used for shelter or protection' and destruction of these places; sale, barter, exchange, transporting for sale or advertising to sell or buy'.

Common frog (top), common toad (middle), natterjack toad (bottom)

### Key ID Features

#### Smooth Newt (*Lissotriton vulgaris*)

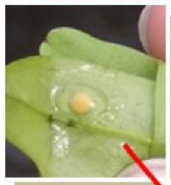
**Egg stage**- Smooth eggs are indistinguishable against palmate newt eggs, are rounded (not oval) and a grey/brown colour when freshly laid.

**Larvae stage**- Larvae are up to 3-4cm long (shorter than GCN), and have less obvious speckling and smaller gills.

**Adult stage**- Adult smooths measure up to 10cm, have a paler body than GCN with an orange belly stripe. Smooths lack some features of palmate newts (notably pink chin, and a cream spot). There is a slight silver/ orange strip along the base of the tail. The crest is wavy along whole back and tail, unlike palmates where it is more of a ridge shape.

(Young smooth)

#### Species protected by UK and European law
#### Great Crested Newt (GCN)- Triturus cristatus



GCN eggs are oval shaped with a pale yellow to white colour, these are usually found singly wrapped in folded leaves. Smooth and Palmate eggs are grey/ brown when freshly laid.

Adults are black, and are also covered in bright yellow spots on the underside and irregular blotches.

Larvae (Efts) are up to 5-9cm long and have distinguishable black speckling on the tail and body

Adults also have a jagged crested tail with a recognisable stripe. Both males and females also have white speckling on the sides.

#### Palmate Newt (*Lissotriton helveticus*)

**Egg stage**- Palmate eggs are indistinguishable against smooth newt eggs, are rounded (not oval) and a grey/brown colour when freshly laid.

**Larvae stage**- Larvae are up to 3-4cm long (shorter than GCN), and have less obvious speckling and smaller gills.

**Adult stage**- Adult palmates measure up to 10cm, have a paler body than GCN with an orange belly stripe. They also have a pink chin with no spots/ speckles and a cream spot on both hind feet.

References:
Acknowledgements:

Version 10 December 2018

# BATS AND ARBORICULTURAL WORKS

## Information, legal responsibilities and best practice

### Legal Protection

All UK Bat species are protected by European and UK law, in practical terms this means it is an offence to:

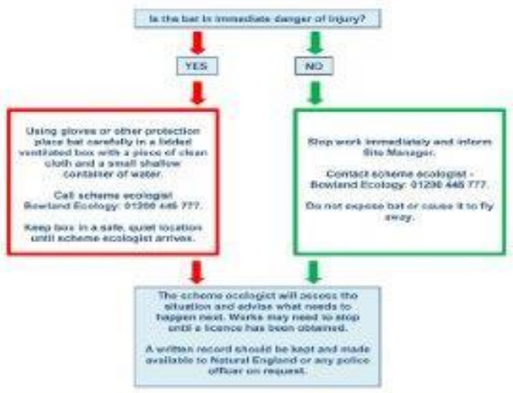
- Deliberately capture, injure or kill a bat;
- Deliberately disturb bats;
- Damage or destroy a breeding site or resting place (even if bats are not occupying the roost at the time);
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place;
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.

Penalties on conviction: the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

**Defences include:**

1. Tending/caring for a bat solely for the purpose of restoring it to health and subsequent release.
2. Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

### Found a bat during unsupervised works?




### How are trees important to bats?


### Bats can roost in the following places:

- Woodpecker holes, rot holes, hazard beams,
- Vertical or horizontal cracks and splits in stems or branches,
- Partially detached platey bark, gaps between overlapping stems, double leaders forming compression forks
- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar,
- Man –made holes, cankers caused by localised bark death,
- Cavities created by branches tearing out from parent stems,
- Other hollows and cavities, including butt-rot
- Partially detached ivy with stem diameters over 50mm.

### Field signs of bat presence:

- Live or dead bats: the smallest UK bat species, the pipistrelle is only 3.5-4.5cm long.
- Droppings: bat droppings look like mouse droppings but will crumble between your fingers (they are dry and made entirely of insects).
- Feeding remains: piles of butterfly/moth wings are often left below bat feeding perches.

### Why wear gloves?

There is a small risk that some bats carry a rabies virus – European Bat Lyssavirus. The purpose of wearing gloves is to reduce the chance of being bitten, as the virus is transmitted via bat saliva. Thick leather gloves are appropriate for removing a bat from imminent danger but these should be clean.

In the event that you are bitten, wash the wound, gently but thoroughly, with soap and water. Speak to a health professional immediately, advising them that you have been bitten by a bat.

**References:**
Bat Conservation Trust. August 2016. Why wear gloves when handling bats?
BCT Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition, 2016

version 1 November 2017

# BATS

## Information, legal responsibilities and best practice for the construction industry

### Legal Protection

All UK Bat species are protected by European and UK law, in practical terms this means it is an offence to:

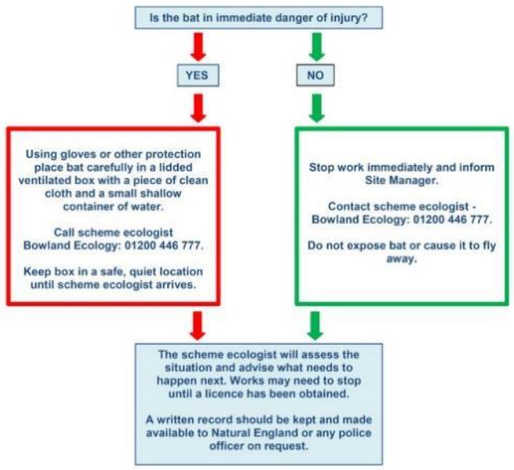
- Deliberately capture, injure or kill a bat;
- Deliberately disturb bats;
- Damage or destroy a breeding site or resting place (even if bats are not occupying the roost at the time);
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place;
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.

Penalties on conviction: the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

**Defences include:**

1. Tending/caring for a bat solely for the purpose of restoring it to health and subsequent release.
2. Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

### Found a bat during unsupervised works?




### Field signs of bat presence:

- Live or dead bats: the smallest UK bat species, the pipistrelle is only 3.5-4.5cm long.
- Droppings: bat droppings look like mouse droppings but will crumble between your fingers (they are dry and made entirely of insects).
- Feeding remains: piles of butterfly/moth wings are often left below bat feeding perches.


Schematic from www.bats.org.uk

### Bats can roost in the following places:

- The top of gable end or dividing wall;
- The top of chimney breasts;
- Ridge and hip beams and other roof beams;
- Mortise and tension joints;
- All beams/ceilings/pipework (free hanging bats);
- The junction of roof timbers, especially where ridge and hip beams meet;
- Behind purlins;
- Between tiles and the roof lining;
- Under flat felt roofs;
- Under barge boards;
- In cavity walls;
- In cracks in stone or concrete;
- Behind peeling paint/wall coverings;
- Gaps behind window and door frames;
- Between window panes and timber boarding.
- In trees (cracks/holes/ivy cladding).

### Why wear gloves?

There is a small risk that some bats carry a rabies virus – European Bat Lyssavirus. The purpose of wearing gloves is to reduce the chance of being bitten, as the virus is transmitted via bat saliva. Thick leather gloves are appropriate for removing a bat from imminent danger but these should be clean.

In the event that you are bitten, wash the wound, gently but thoroughly, with soap and water. Speak to a health professional immediately, advising them that you have been bitten by a bat.

**References:**
**Bat Conservation Trust. August 2016. Why wear gloves when handling bats?**
**BCT Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition, 2016**

**version 1 August 2017**

# Appendix G – Legal Information

This report provides guidance of potential offences as part of the impact assessment. This report does not provide detailed legal advice and for full details of potential offences against protected species the relevant acts should be consulted in their original forms i.e. The Wildlife and Countryside Act, 1981, as amended, The Countryside and Rights of Way Act 2000, The Natural Environment and Rural Communities Act, 2006 and The Conservation of Habitats and Species Regulations 2017.

| Species | Legislation | Offences | Notes on licensing procedures and further advice |
|---|---|---|---|
| **Species that are protected by European and national legislation** | | | |
| **Badger** | Protection of Badgers Act 1992 | Wilfully kill, injure or take a badger; Intentionally or recklessly damage, destroy or obstruct access to a badger sett; Disturb a badger in its sett. It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied. | Where required, licences for development activities involving sett loss, damage or disturbance are issued by Natural England (NE). Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process.<br>Licences are normally not granted from December to June inclusive because cubs may be present within setts.<br>https://www.gov.uk/badgers-protection-surveys-and-licences |
| **Bats**<br>*European protected species* | Conservation of Habitats and Species Regulations 2017 Reg 41 | Deliberately[1] capture, injure or kill a bat; Deliberate disturbance[2] of bats; Damage or destroy a breeding site or resting place used by a bat. The protection of bat roosts is considered to apply regardless of whether bats are present. | An NE licence in respect of development is required in England.<br>https://www.gov.uk/bats-protection-surveys-and-licences<br>*European Protected Species: Mitigation Licensing- How to get a licence* (NE 2010)<br>*Bat Mitigation Guidelines* (English Nature 2004)<br>*Bat Workers Manual* (JNCC 2004)<br>*BS8596:2015 Surveying for bats in trees and woodland* (BSI, 2015) |
| | Wildlife and Countryside Act 1981 (as amended)[4] S.9 | Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place. | Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site. |

| Species | Legislation | Offences | Notes on licensing procedures and further advice |
|---|---|---|---|
| **Birds** | Conservation of Habitats and Species (Amendment) Regulations 2012 | N/A | Authorities are required to take steps to ensure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat. This includes activities in relation to town and country planning functions. |
| | Wildlife and Countryside Act 1981 (as amended)[4] S.1 | Intentionally kill, injure or take any wild bird; Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; Intentionally take or destroy the nest or eggs of any wild bird.<br>**Schedule 1 species** Special penalties are liable for these offences involving birds on Schedule 1 (e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover). Intentionally or recklessly[3] disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species. | No licences are available to disturb any birds in regard to development.<br>Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development.<br>General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety.<br>https://www.gov.uk/wild-birds-protection-surveys-and-licences<br>https://www.gov.uk/prevent-wild-birds-damaging-your-land-farm-or-business |
| | Wildlife and Countryside Act 1981 (as amended)[4] S.9 | Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb a dormouse in such a place. | Licence issued for survey and conservation by NE. |
| **Great crested newt**<br>*European protected species* | Conservation of Habitats and Species Regulations 2017 Reg 41 | Deliberately[1] capture, injure or kill a great crested newt; Deliberate disturbance[2] of a great crested newt; Deliberately take or destroy its eggs;<br>Damage or destroy a breeding site or resting place used by a great crested newt. | Licences issued for development by NE.<br>https://www.gov.uk/great-crested-newts-protection-surveys-and-licences<br>*European Protected Species: Mitigation Licensing - How to get a licence* (NE 2010)<br>*Great Crested Newt Mitigation Guidelines* (English Nature 2001) |
| | Wildlife and Countryside Act 1981 (as amended)[4] S.9 | Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb a great crested newt in such a place. | Licences issued for science (survey), education and conservation by NE. |
| | Wildlife and Countryside Act 1981 (as amended)[4] S.9 | Intentionally or recklessly[3] obstruct access to any structure or place used for shelter or protection or disturb an otter in such a place. | No licence is required for survey in England. However, a licence would be required if the survey methodology involved disturbance. |

| Species | Legislation | Offences | Notes on licensing procedures and further advice |
|---|---|---|---|
| **Other species** | | | |
| **Rabbits, foxes and other wild mammals**<br>**For BAP species and Species of Principal Importance, see below** | Wild Mammals (Protection) Act 1996 | Intentionally inflict unnecessary suffering to any wild mammal. | Natural England provides guidance in relation to rabbits (Technical Information note TIN003, Rabbits- management options for preventing damage, July 2007) and foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys, see Species Information notes SIN003 (2011), *Urban foxes* and SIN004 (2011) *The red fox in rural areas* as well as other wild mammals.<br>Lawful and humane pest control of these species is permitted. |

[1] Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing [2] Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong. Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided. Thus deliberate disturbance that does not result in either (a) or (b) above would be classed as a lower level of disturbance. [3] The term 'reckless' is defined by the case of Regina versus Caldwell 1982. The prosecution has to show that a person deliberately took an unacceptable risk, or failed to notice or consider an obvious risk. [4] The Wildlife and Countryside Act (1981) has been updated by various amendments, including the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006. A full list of amendments can be found at https://jncc.gov.uk/our-work/wildlife-countryside-act/

| Habitats & Species | Legislation | Guidance |
|---|---|---|
| **Species and Habitats of Principal Importance for the Conservation of Biodiversity** | Natural Environment & Rural Communities Act 2006 S.40 (which superseded S.74 of the Countryside & Rights of Way Act 2000). | S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity in England (identified by the Secretary of State in consultation with NE) are referred to in S.41 of the NERC Act: http://webarchive.nationalarchives.gov.uk/20140605090108/http:/www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx The list of habitats and species was updated in 2007 to ensure that it remained focussed on the correct priorities: https://jncc.gov.uk/our-work/uk-bap/ The criteria for selection included international threat, responsibility and importance, rate of decline/risk, importance of habitats for key species, and other important factors. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species. |
| **Hedgerows** | The Hedgerow Regulations 1997 | Under the regulations, it is against the law to remove or destroy hedgerows that are classified as "important" under the regulations without permission from the local planning authority. The regulations apply if a hedgerow is in or runs alongside agricultural land, common land including town or village greens, land used for forestry or for the breeding or keeping of horses etc, a local nature reserve or Site of Special Scientific Interest. A hedgerow can be classified as 'Important' due to its wildlife and landscape value or due to its heritage value. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species/diversity of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.<br>See https://www.gov.uk/guidance/countryside-hedgerows-regulation-and-management for further guidance and information. |
| **Japanese knotweed, hybrid knotweed, giant knotweed**<br>**Giant hogweed**<br>**Rhododendron**<br>**Himalayan balsam** | Wildlife and Countryside Act 1981 (as amended) S.14 | It is illegal to plant these species or otherwise cause them to grow or spread in the wild.<br>Any contaminated soil or plant material containing Japanese knotweed or giant hogweed is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with section 34 of the Environmental Protection Act 1990.<br>*The Knotweed Code of Practice* (Environment Agency, 2013) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/536762/LIT_2695.pdf<br>*Managing and controlling invasive rhododendron* (Forestry Commission, 2006) https://www.forestresearch.gov.uk/documents/2557/fcpg017.pdf<br>https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants<br>https://www.gov.uk/guidance/prevent-japanese-knotweed-from-spreading |

# Appendix H – GCN eDNA Result

SureScreen Scientifics

Folio No: E16855
Report No: 1
Purchase Order: BOW25
Client: BOWLAND ECOLOGY
Contact: Bowland Ecology

## 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:** 25/04/2023
**Date Reported:** 08/05/2023
**Matters Affecting Results:** None

| Lab Sample No. | Site Name | O/S Reference | SIC | DC | IC | Result | Positive Replicates |
|---|---|---|---|---|---|---|---|
| 0546 | Northcote - 001 | - | Pass | Pass | Pass | Negative | 0 |

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

**Reported by:** Gabriela Danickova **Approved by:** Chris Troth

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
Company Registration No. 08950940

SureScreen Scientifics

## 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.

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