



GOLDTHORPE ROAD, GOLDTHORPE.

OS REF: SE 46140 03858.

ECOLOGICAL IMPACT ASSESSMENT.

Ref No: 211045/EcIA/2021/REV1.

Date: 8th February 2022.

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1. INTRODUCTION.

1.1. There are plans to develop an area of land off Goldthorpe Road in Goldthorpe with a large residential development. A proposed plan is shown in Appendix VIII of this report.

1.2. Whitcher Wildlife Ltd was commissioned to carry out a Preliminary Ecological Appraisal of the site to establish whether there were any issues that may affect the proposed works. This survey was carried out on 21st September 2018.

1.3. The ponds identified in the initial survey were visited on 3rd October 2018 to assess the ponds and carry out a Habitat Suitability Index (HSI) Assessment.

1.4. The council then provided two phase 1 habitat reports. One report (364 – GAT20) covers the northwest corner of the site, carried out in October 2015. The second report (428 – DEA26) covers the rest of the site, with the exception of the bungalow and gardens, carried out in August 2013. These reports have been referred to throughout this report.

1.5. The report was amended after a site visit with the council and the client on the 22nd November 2018. A new development plan was also provided.

1.6 A great crested newt eDNA test was carried out of the pond to the east of the site on 23rd April 2019. The results of that survey are included in this report.

1.7. A site visit was carried out on the 23rd April 2019 due to reports of the bungalow on the site having been burnt down.

1.8. A bat dusk emergence survey was carried out of the bungalow on the site on the 2nd May 2019. The results of this survey are included in this report.

1.9. Due to the age of the initial Preliminary Ecological Appraisal carried out in 2018 Whitcher Wildlife Ltd has now been commissioned to carry out a Preliminary Ecological Appraisal of the site to update the initial findings and assess whether any thing has changed. This survey was carried out on 6th October 2021 and this report outlines the findings of all surveys and makes appropriate recommendations.

1.10. Now all further surveys have been carried out, Whitcher Wildlife Ltd have been commissioned to prepare an Ecological Impact Assessment (EcIA) in line with the CIEEM guidance, to support the application for planning permission.

1.11. During the October 2021 survey no significant changes to the site were identified and no further surveys are required. Therefore, the EcIA has been updated.

1.12. Appendices I to IV of this report provide additional information on specific species and are designed to assist the reader in understanding the contents of this report.

2. SURVEY METHODOLOGY.

2.1. Prior to visiting the site, the survey area was cross referenced to maps and aerial photographs to give a general idea of the habitats and potential issues within the area and to identify potential access and walking routes.

2.2. The survey area was walked where access was agreed and public rights of way were used where no access was agreed. All habitats within and immediately around the survey area were documented and the dominant species within that habitat listed in line with the JNCC Handbook for Phase 1 Habitat surveys.

2.3. The survey area and immediate surrounding area was thoroughly searched for evidence of badger (*Meles meles*) activity by looking for the following signs in line with Harris S, Cresswell P and Jefferies D (1989). *Surveying Badgers*. Mammal Society: -

- * Badger setts.
- * Badger latrines or dung pits.
- * Badger snuffle holes and evidence of foraging.
- * Badger paths.
- * Badger prints in areas of soft mud.
- * Badger hairs caught on fencing.

2.4. The survey area was searched for watercourses and where found all watercourses within the survey area and for approximately 50m in each direction were thoroughly searched for evidence of water vole (*Arvicola amphibius*) activity by looking for the following signs, in line with Rob Strachan, Tom Moorhouse and Merryl Gelling (2011). *Water Vole Handbook: Third Edition*: -

- * Water vole burrows.
- * Water vole faeces and latrines.
- * Water vole feeding stations.
- * Water vole runs.
- * Water vole prints in areas of soft mud.
- * Water vole lawns.
- * Predator field signs.

2.5. The survey area was searched for watercourses and where found all watercourses within the survey area and for approximately 50m in each direction were thoroughly searched for evidence of otter (*Lutra lutra*) activity by looking for the following signs in line with the P Chanin (2003). *Monitoring the Otter and Conserving Natura 2000 Rivers: Monitoring Series No10 Guidelines*: -

- * Otter prints in soft mud.
- * Otter spraints.
- * Otter Holts.

2.6. The survey area was searched for watercourses and waterbodies. Where found, and where safe to enter the water, all were thoroughly searched for the presence of crayfish, for approximately 50m in each direction of the site, by searching under rocks and logs. Where stated, crayfish traps were also deployed into the watercourse. All survey work was carried out in accordance with the *Conserving Natural 2000 Rivers Monitoring Series No 1, Protocol for Monitoring the White Clawed Crayfish*.

2.7. The survey area was searched for mature trees and derelict buildings and where found these were checked for potential bat roosting sites in line with Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition) by looking for the following signs: -

- * Holes, cracks or crevices.
- * Bat Droppings.

2.8. The land immediately adjacent to the survey area was assessed for bat roosting potential and bat foraging potential. Connective routes and flight lines were also assessed whilst on site and using maps of the area.

2.9. The area within 500m of the survey site was cross referenced to maps to highlight all ponds close to the site. Where possible, all ponds identified were accessed using agreed access or public rights of way to assess the potential for great crested newts (*Triturus cristatus*) to be present.

2.10. The survey area was assessed for the potential for reptiles and suitable reptile habitats. Where applicable the area was also searched for the presence of reptiles.

2.11. Where appropriate, the habitat within and surrounding the survey area was searched for species such as hazel, oak, honeysuckle, bramble and other species which may provide potential habitat for hazel dormice (*Muscardinus avellanarius*). Field signs such as feeding remains and nests were also searched for where possible,

in line with P Bright, P Morris and T Mitchell-Jones *The Dormouse Conservation Handbook 2nd Edition*.

2.12. Where appropriate, the area within and surrounding the survey area was assessed for its potential to house habitat for red squirrels. Field signs of red squirrels were searched for at least every 50m, looking for any dreys, feeding signs or sightings of red squirrels.

2.13. All surveys were carried out in line with the Chartered Institute of Ecological and Environmental Management (CIEEM) survey standards and advice.

2.14. This document is prepared in line with The National Planning Policy Framework (NPPF). This sets out the government policy on biodiversity and nature conservation and places a duty on Planning Authorities to give material consideration to the effect of a development on legally protected species when considering planning applications. The NPPF and the Planning Practice Guidance on “Natural Environment” also promote sustainable development by ensuring that developments take account of the role and value of biodiversity and that it is conserved and enhanced within the development.

2.15. This report is prepared in line with the Natural Environment and Rural Communities (NERC) Act that came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.

2.16. This survey was carried out by Jenny Whitcher Roebuck MCIEEM. Since 2001 Jenny has had experience in a professional capacity as a Wildlife Consultant carrying out Ecology Surveys and Phase 1 Habitat surveys. Jenny holds Natural England Survey Licences in respect of bats, great crested newts, crayfish and barn owls, NRW and SNH Survey Licences in respect of bats and great crested newts. She has also successfully completed a number of courses run by the Chartered Institute of Ecology and Environmental Management (CIEEM), the Bat Conservation Trust (BCT) and the Field Studies Council (FSC) in the relative protected species, plant species and in carrying out Phase 1 Habitat Surveys. As a full member of CIEEM she is committed to continuous professional development, a continual process of learning and career development, a condition of CIEEM membership.

3. ECOLOGICAL BASELINE.

3.1. Data Search Results.

3.1.1. Desktop data searches were requested from Sheffield Biological Records Centre for records of protected species and designated sites within 2km of the survey area, from South Yorkshire Badger Group for records of badgers within 2km of the survey area and from South Yorkshire Bat Group for records of bats and bat roosts within 2km of the survey area. The full data searches are available on request to the client.

3.1.2. Sheffield Biological Records Centre holds one record of one male great crested newt within the eastern end of the survey area from 2011 and three records of great crested newts 400m to the east of the site from 2011. However, all four records are recorded as “pond near or adjacent to Barnburgh Lane”. The grid reference for the record on the site is one digit different to the other three records and there is no pond in or near to its location. Therefore, it is possible that this grid reference is wrong, and this record is in the same location as the other three.

3.1.3. There are numerous records of bats within 2km of the survey area, although there are no records within or adjacent to the survey area. The nearest record lies 300m to the northeast of the site and is of one Pipistrelle bat recorded in 1998. The nearest roost record lies 450m to the north of the site and is a small Pipistrelle roost recorded in 2016.

3.1.4. There is one field record of a grass snake 1.2km to the south of the site from 2013. There are no other records of reptiles within 2km of the site.

3.1.5. There are no records of designated sites within or surrounding the survey area. The nearest record lies 675m to the south of the site and is Bolton upon Dearne Wetlands Local Wildlife Site.

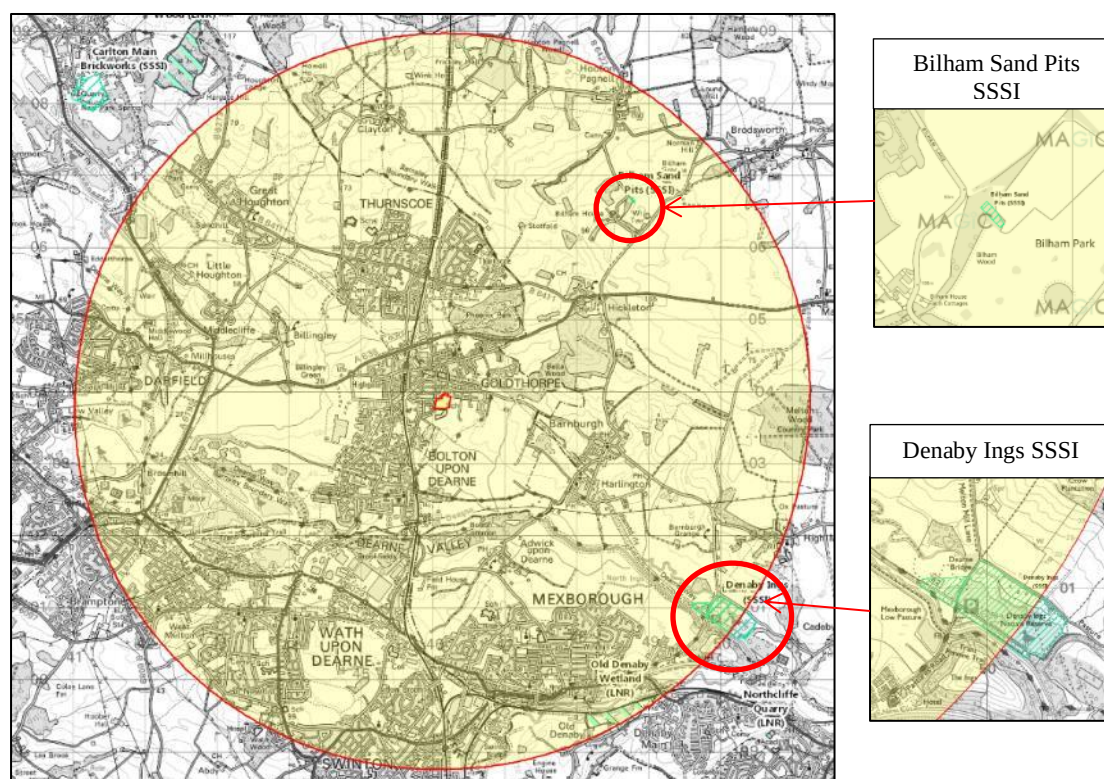
3.1.6. South Yorkshire Badger Group have no records of badgers within 2km of the survey area.

3.1.7. South Yorkshire Bat Group hold one record 115m to the northwest of the northwest corner of the site of an injured bat found in 2005. The nearest roost record

is located 500m to the north and is of a single Common Pipistrelle day roost recorded in 2016. There are no records specific to the survey area.

3.8. The site lies wholly within the Dearne Valley Green Heart Nature Improvement Area. The aim of this is to help restore and enhance the ecological networks of the river, its floodplain and its link to habitats on surrounding slopes and hills.

3.9. A search of the MAGIC website was carried out to identify any European designated sites within 5km of the survey area. No European designated sites were identified within 5km of the site. However, two UK designated sites were identified, as shown on the map below, which shows a 5km buffer around the survey area.



3.10. The Bilham Sand Pits SSSI was identified 3.85km to the northeast of the site. The SSSI is designated for its Permian sediments.

3.11. Denaby Ings SSSI lies 4.8km to the southeast of the site. The SSSI is designated for its extensive water meadows.

3.12. The RSPB's Adwick Washlands Nature Reserve lies 720m to the southeast of the survey area. This is an area of water meadows and marshes and is home to a variety of bird species. This is not currently a designated site.

3.1.3. Whitcher Wildlife Ltd are trying to get a response from the RSPB on the value of the site in relation to this development, as requested from the council ecologist. There has been no response to date.

3.1.4. The only information on this site on the RSPB website states the following. "Adwick Washland in the Dearne Valley is a special place of ever-changing vistas and wide-open skies. What was once an area of farmed fields has since been transformed into water meadows and marshes, home to lots of fascinating wildlife such as wigeons, redshank and kestrels. A bridleway runs through the site and a short path takes you to a central viewing point with panoramic views across the washland. A further 2.5km of permissive paths allow visitors to walk the perimeter of the site. The River Dearne flows past the southern edge of the site and can be taken in as part of a circular walk from the car park on Furlong Road."

3.2. The Surveyed Area.

3.2.1. The survey area is a large area of land off Goldthorpe Road in Goldthorpe. The site includes a disused bungalow. The aerial photograph below shows the survey area.



3.2.2. The aerial photograph below shows the survey area and the surrounding area.



3.2.3. The southern half of the site is currently heavily grazed by three horses and the northern half of the site is overgrown. Since the initial survey was carried out in 2018 the bungalow that was present on the site has been demolished, as can be seen on the aerial photograph above.

3.2.4. The site generally remains the same as in the previous survey in 2018, although the vegetation is denser as the site has remained relatively untouched for three years.

3.3. Description of Habitats.

3.3.1. Appendix VI of this report contains annotated maps marked up with the varying habitats that are cross referenced to target notes in Appendix VII of this report. The habitats on and adjacent to the site are: -

- Tall Ruderal
- Semi-Improved Neutral Grassland
- Poor Semi-Improved Grassland
- Dense Scrub
- Scattered Scrub
- Woodland, Broad-Leaved
- Scattered Trees
- Bare Ground
- Building
- Hedge, Defunct, Species Poor
- Wall
- Fence

3.3.2. Tall Ruderal

3.3.2.1. The northern half of the site is overgrown with tall ruderal and scrub species.

3.3.2.2. The northwest corner of the site is overgrown with tall ruderal species, including spear leaved orache (*Atriplex prostrata*), dandelion (*Taraxacum officinale*), coltsfoot (*Tussilago farfara*), sow thistle (*Sonchus oleraceus*), hogweed (*Heracleum sphondylium*), nettle (*Urtica dioica*), thistle (*Cirsium sp(p)*), dock (*Rumex sp.*), mugwort (*Artemisia vulgaris*) and weld (*Reseda luteola*) with buddleia (*Buddleja davidii*), bramble (*Rubus fruticosus*) and sapling silver birch (*Betula pendula*). The photographs below show the vegetation growing in this area.



3.3.2.3. The area where the bungalow once was and the area to the south of this, once the rear garden, is overgrown with mugwort (*Artemisia vulgaris*), dock (*Rumex sp.*), nettle (*Urtica dioica*), thistle (*Cirsium sp(p)*), dandelion (*Taraxacum officinale*), creeping buttercup (*Ranunculus Repens*), hogweed (*Heracleum sphondylium*), common knapweed (*Centaurea nigra*), ragwort (*Senecio jacobaea*) and hedge bindweed (*Calystegia sepium*) with some false oat grass (*Arrhenatherum elatius*), perennial rye grass (*Lolium perenne*) and cocks foot (*Dactylis glomerata*). The bungalow was demolished approximately 1 year ago, and the rubble left on site is now also overgrown with the same tall ruderal species.



3.3.2.4. The large area of tall ruderal species on the northeast side of the site is dominated by nettle (*Urtica dioica*) with cow parsley (*Anthriscus sylvestris*), hogweed (*Heracleum sphondylium*), thistle (*Cirsium sp(p)*), white dead nettle (*Lamium album*), dandelion (*Taraxacum officinale*), mugwort (*Artemisia vulgaris*), rosebay willowherb (*Chamerion angustifolium*), cocks foot (*Dactylis glomerata*), false oat grass (*Arrhenatherum elatius*), annual meadow grass (*Poa annua*), hedge bindweed (*Calystegia sepium*) and comfrey (*Symphytum officinale*) with occasional dog rose (*Rosa canina*), bramble (*Rubus fruticosus*), sapling ash (*Fraxinus excelsior*) and

hawthorn (*Crataegus monogyna*). The tall ruderal habitat is being overgrown by the scrub habitats in this area.

3.3.2.5. The photographs below show the vegetation growing in this area.



3.3.2.6. At the northern edge of this area there is an area that is being used by the adjacent resident as a small garden area and vegetable patch with squash plants growing. **(T4)** The photographs below show this area.



3.3.2.7. At the eastern side of the site there is an area of tall ruderal and scrub that was identified in previous reports as an area of semi-improved neutral grassland **(T6)**. This was previously classified in the 2018 survey as tall ruderal and has again in the 2021 survey been classified as tall ruderal habitat as the area of grassland is very small, smaller than in 2018 as it is becoming overgrown with tall ruderals and scrub.

3.3.2.8. The photograph below shows this area, taken on 22nd November 2018.



3.3.2.9. The photograph below shows this area, taken on 6th October 2021 and shows that the grassland area has considerably reduced in size.



3.3.3. Poor Semi-Improved Grassland

The southern half of the site (**T5**) is heavily grazed by three horses and has a short sward length. The grass species are too short to identify many species although cocks' foot (*Dactylis glomerata*) was present. Other species growing in this habitat include ragwort (*Senecio jacobaea*), nettle (*Urtica dioica*), thistle (*Cirsium sp(p)*), dandelion (*Taraxacum officinale*), teasel (*Dipsacus fullonum*), dock (*Rumex sp.*), ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), mugwort (*Artemisia vulgaris*), burdock (*Arctium lappa*), red clover (*Trifolium pratense*), creeping buttercup (*Ranunculus Repens*) and yarrow (*Achillea millefolium*). The photographs below show this heavily grazed area.



3.3.4. Dense Scrub

3.3.4.1. There are numerous areas of dense scrub on the site, all mainly in the northern half of the site.

3.3.4.2. Around the area where the bungalow (**T1**) once stood and in what was the rear garden there are areas of bramble (*Rubus fruticosus*) scrub.



3.3.4.3. The large area at the northeast of the site has large areas of dense scrub which is overgrowing the tall ruderal habitat around it. The main species present in this scrub habitat is bramble (*Rubus fruticosus*) with dog rose (*Rosa canina*), Russian vine (*Fallopia baldschuanicum*), hedge bindweed (*Calystegia sepium*), hawthorn (*Crataegus monogyna*), sapling cherry (*Prunus sp(p)*) and elder (*Sambucus nigra*). These areas of scrub have spread into the surrounding habitats over the last three years. The photographs below show some of the scrub in this area.



3.3.5. Scattered Scrub

3.3.5.1. Within the area at the northwest corner of the site is scattered scrub mainly consisting of bramble (*Rubus fruticosus*), buddleia (*Buddleja davidii*) and sapling silver birch (*Betula pendula*) and goat willow (*Salix caprea*). The photograph below shows scattered scrub in this area.



3.3.5.2. There are also numerous areas of scattered scrub on the northeast side of the site where the areas of dense scrub are spreading into the areas of tall ruderal habitat.



3.3.6. Woodland, Broad-Leaved

At the very northeast corner of the site is a group of sapling and small semi-mature self-sown aspen (*Populus tremuloides*). As these trees are approximately 15m in height they have been classed as woodland rather than scrub. The understory is mainly sparse bramble (*Rubus fruticosus*). The photographs below show the small area of woodland.



3.3.7. Scattered Trees

3.3.7.1. Throughout the site there are areas of scattered trees. Within the northern half of the site these trees include semi-mature elder (*Sambucus nigra*), wild cherry (*Prunus avium*), silver birch (*Betula pendula*), wych elm (*Ulmus glabra*), hawthorn (*Crataegus monogyna*), Leyland cypress (*Cupressocyparis leylandii*), blackthorn (*Prunus spinosa*), sycamore (*Acer pseudoplatanus*), plum (*Prunus sp(p)*), apple (*Malus domestica*) and ash (*Fraxinus excelsior*).

3.3.7.2. The photographs below show some of the scattered trees throughout the northern half of the site.





3.3.7.3. Within the southern half of the site there are some semi-mature trees along the site boundaries, including hawthorn (*Crataegus monogyna*), sycamore (*Acer pseudoplatanus*) and silver maple (*Acer saccharinum*). On the southern boundary there are two small Tibetan cherry (*Prunus serrula*) trees (identified from the tree survey report), although one is dead.

3.3.7.4. The photograph below shows a Tibetan cherry on the southern boundary.



3.3.7.5. In the southwest corner of the site there is a group of small mature and semi-mature trees, including lilac (*Lilac vulgaris*), crab apple (*Malus sp(p)*), elder (*Sambucus nigra*), sycamore (*Acer pseudoplatanus*) and wild cherry (*Prunus avium*). The photograph below shows the southwest corner of the site.



3.3.7.6. On the western boundary is another group of small mature and semi-mature trees, including sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), wild cherry (*Prunus avium*) and common lime (*Tilia vulgaris*). There is also scattered snowberry (*Symphoricarpos albus*) scrub growing below these trees. The photograph below looks south along the western boundary.



3.3.8. Bare Ground

3.3.8.1. At the northern end of the site is an area that has been cleared by the adjacent resident who is using this area as part of their garden (**T4**). There are well-worn bare earth paths in this area, shown in the photographs below.



3.3.8.2. At the western side of the site is an area of tarmac which remains from the site former use of the site, shown in the right photograph below.



3.3.9. *Building*

3.3.9.1. Building 1 (**T1**) is no longer present. This was a bungalow, present in the 2018 survey. However, this was demolished approximately 1 year ago due to vandalism and fire damage making the building unsafe.

3.3.9.2. Building 2 (**T2**).

This is a small substation constructed with brick cavity walls with uPVC fascia's, a flat felt roof and large metal doors on the western side. The brickwork is in good condition with no cracks or gaps, the fascias are tight fitting and the roof appears to be in good condition. The doors are well sealed and locked, and no access was available inside this building. However, this is not considered a constraint to the survey due to the good condition of the building.



3.3.9.3. Building 3 (T3).

3.3.9.3.1. This is a small single storey building on the southern edge of the site. The building is constructed with solid brick walls which are wood clad with a flat felt roof. Internally the building is one room open to the felt covered wood of the roof with exposed brick walls with some machinery present suggesting this may be a pumping station. The doors on the northern side of the building are locked and since the previous survey have been boarded up inside and made secure.

3.3.9.3.2. The roof is in poor condition with holes due to rotten wood below the felt. The wood cladding has been removed or has fallen off the western end of the building.



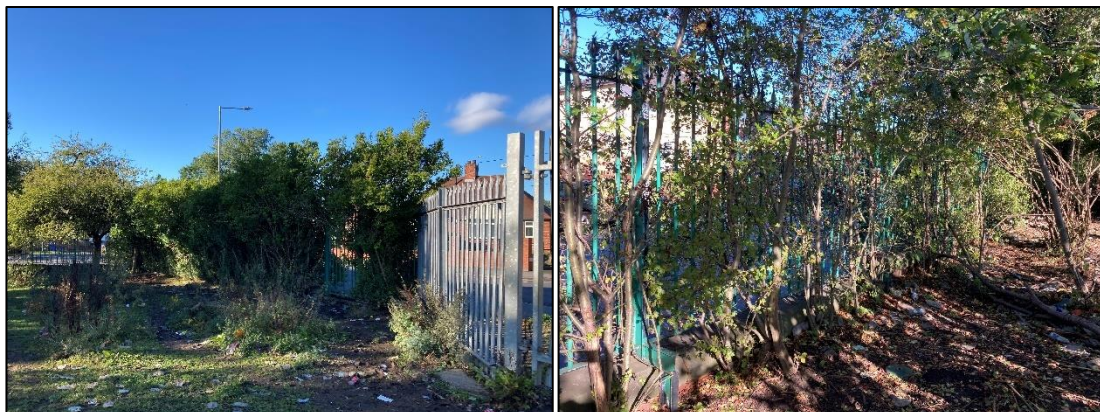
3.3.10. Hedge, Defunct, Species Poor

3.3.10.1. There are three sections of defunct hedge on the site. One section is at the western side of the bungalow and is a short section of Leyland cypress (*Cupressocyparis leylandii*) hedge on the corner of the adjacent section of the site. This hedge has not been managed and the trees are very tall. These trees have suffered fire damage from the vandalism to the bungalow.



3.3.10.2. At the southern end of the site on the western boundary there are two sections of hedgerow on the inside of the boundary fence. At the southern end of the boundary is a small section of privet (*Ligustrum Vulgare*) hedge, shown below in the left photograph.

3.3.10.3. Further north on the western boundary is a hawthorn (*Crataegus monogyna*) hedge on the fence line, shown below in the photograph on the right.



3.3.11. Wall

3.3.11.1. Along the southern site boundary and the southern half of the western side boundary there is a low brick wall with stone toppers with the metal railing fence on the top of the wall. At the northern end of the site on the western end is a small section of brick wall with palisade fencing along the top.

3.3.11.2. At the northern end of the site there is a section of the boundary that is the side wall of the neighbouring terrace house and the garden wall. At the northern end of the site on the western side is an area where the boundary wall is the rear walls of two barns.

3.3.11.3. At the eastern side of where the bungalow once stood there is a small section of stone wall that appears to have been the boundary wall of the property, but this is now overgrown and falling away in places.

3.3.11.4. At the northern end of the site in an area of dense scrub is a small section of stone wall extending under an area of dense scrub and scattered trees.

3.3.11.5. The photographs below show, in order, the northwest corner of the site, the wall to the east of the bungalow, the northern boundary wall and the small wall under dense scrub at the northern end of the site.





3.3.12. Fence

There is a variety of fences within the survey area, but the fences are mainly metal railing and palisade. The photographs below show some of the fences on the site.

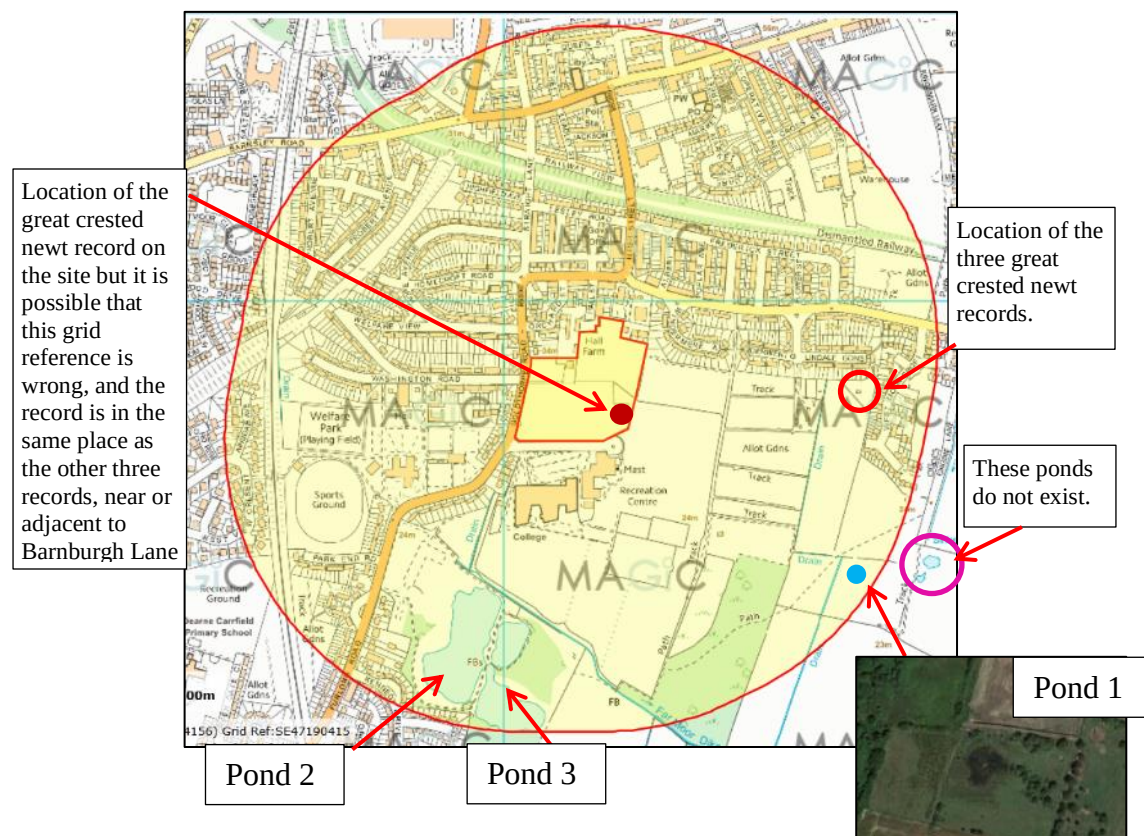


3.4. Description of Fauna.

3.4.1. No badger setts or badger field signs were identified within the survey area.

3.4.2. No watercourses were identified within the survey area. Therefore, there is no habitat for water voles, otters or white clawed crayfish within the survey area.

3.4.3. Three ponds were identified within 500m of the survey area on an Ordnance Survey Map of the area and Google images. The three ponds have been given a number and are shown on the map below, along with the location of the great crested newt records.



Pond ref	Pond 1
SI1 - Location	1
SI2 - Pond area	0.8
SI3 - Pond drying	0.9
SI4 - Water quality	0.33
SI4 - Shade	1
SI6 - Fowl	1
SI7 - Fish	0.33
SI8 - Ponds	0.7
SI9 - Terr'l habitat	0.33

3.4.4. Pond 1 lies to the southeast of the site, 460m from the eastern edge. This pond is not shown on the OS map but is shown on the Google aerial

SI10 - Macrophytes	0.7
HSI	0.65
Suitability	Average

photographs. This is not the pond where the great crested newt records are, it lies 260m to the south of the GCN records. The pond was visited on 3rd October 2018 to carry out an HSI assessment. The HSI score for the pond is 0.65, which means the pond provides average suitability for great crested newts. However, the pond is becoming very overgrown with bulrush extending well out into the pond and the banks and edges of the pond are well trampled by cattle, which have full access into the pond. The water is contaminated and churned up with the cattle waste entering the pond.

3.4.5. The immediate terrestrial habitat around this pond is grazing land, which is low value habitat for great crested newts. To the west of this is an area of rough grassland and scrub, which is good terrestrial habitat for great crested newts. Beyond this habitat, between this and the survey area is a large area of well managed playing fields, low value terrestrial habitat and a barrier to movement. There are no other ponds in this direction. The photograph below shows Pond 1.



3.4.6. There is a drainage ditch, which extends from the field to the north of Pond 1 and then turns west and ends up in Pond 1. This ditch shows signs that works have recently been carried out to the ditch and the ditch is totally dry. The photograph opposite shows this ditch as it leads to the pond.



3.4.7. Immediately to the north of Pond 1, 20m away, is a large building development with houses currently being built within 50m of this pond and there is no evidence of any great crested newt mitigation around this building site. The photograph below was taken looking north, showing the boundary fence of the development, 20m from Pond 1 to the south.



3.4.8. Ponds 2 and 3 are Bolton Brick Ponds fishing lakes, which lie 290m to the south of the southern edge of the survey area. These are two large fishing lakes stocked with large fish, including carp, pike, bream, rudd, roach, large eels, ruffe, chub and tench. The predatory fish in this pond make it very unlikely that great crested newts will breed in these ponds. The ponds were visited on 3rd October 2018 and an HSI assessment carried out. Both ponds score poor suitability for great crested newts.

Pond ref	Pond 2	Pond 3
SI1 - Location	1	1
SI2 - Pond area	---	---
SI3 - Pond drying	0.9	0.9
SI4 - Water quality	0.67	0.67
SI4 - Shade	1	1
SI6 - Fowl	0.01	0.01
SI7 - Fish	0.01	0.01
SI8 - Ponds	0.7	0.7
SI9 - Terr'l habitat	0.33	0.33
SI10 - Macrophytes	0.3	0.03
HSI	0.25	0.20
Suitability	Poor	Poor

3.4.9. The terrestrial habitat between the site and Ponds 2 and 3 is The Dearne ALC School and Dearnside Leisure Centre and large areas of well managed playing fields, low value terrestrial habitat for amphibians and a barrier to movement. The photograph below shows Pond 2.



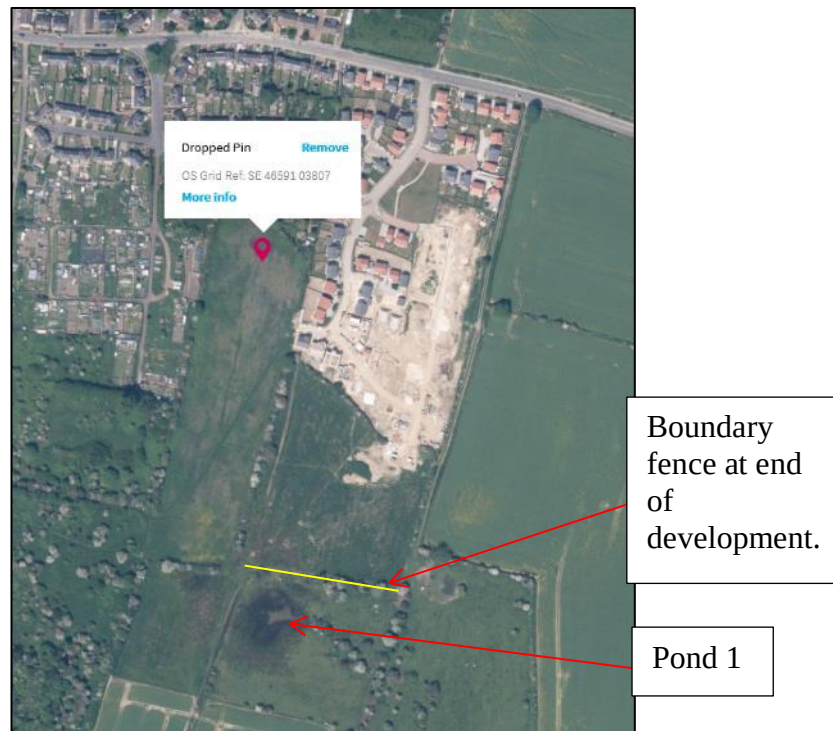
3.4.10. The photographs below show both sections of Pond 3 as the pond has a narrow channel in the center.



3.4.11. The terrestrial habitat on the site in some areas is suitable habitat for great crested newts. However, due to the distance Pond 1 is from the site and the low value habitat adjacent to the site it is assessed as very unlikely that great crested newts would travel as far as the survey area.

3.4.12. The location of the great crested newt records is 260m to the north of Pond 1. Access to identify whether there is a pond in this location was not available as it is private land and there is no pond shown on the Ordnance Survey Map or on Google

images. The aerial photograph below shows the OS grid reference location of the GCN records. This aerial photograph also shows the new development near to Pond 1 and very near to the GCN records. This development is now further on than shown in the image, extending to within 20m of Pond 1.



3.4.13. On 23rd April 2019 water samples were taken from this pond to carry out an eDNA survey of the pond for the presence of great crested newts. The results of the survey are negative. Appendix XI contains the report sheet for these results.

3.4.13. There are two buildings on the site.

3.4.14. Building 2 (**T2**) is a small brick substation which is in good condition and well-sealed and provides **negligible** potential for roosting bats.

3.4.15. Building 3 (**T3**) is a single storey brick building partly clad with wood with a flat felt roof. The roof is in poor condition with a hole due to rotten wood below the felt. The wood cladding has been removed or has fallen off over a large part of the building,

3.4.16. During the site visit on 23rd April 2019 the building was surveyed and more cladding has fallen away leaving the gaps more exposed and the gaps behind the cladding could be more thoroughly inspected using a torch and endoscope. No bats or bat field signs were found. Therefore, the building has been reassessed as providing **negligible** potential for roosting bats.

3.4.17. The trees on the site are all sapling, semi-mature or small mature species. However, some of these trees are in areas of dense scrub and could not be thoroughly surveyed from ground level. No obvious features suitable for roosting bats were identified during this survey but there could be features present in areas which could not be seen. According to the tree survey carried out on the site by others there are a number of trees that are structurally assessed as poor and these could contain features suitable for roosting bats.

3.4.18 The survey area provides low potential for foraging and commuting bats. There is little connecting vegetation between this site and the surrounding area. However, the housing around the site does provide some connectivity. The scrub habitat at the northern end of the site provides some foraging habitat for bats.

3.4.19. The vegetation within the survey area provides abundant opportunities for nesting birds during the nesting season, which extends from March to September each year. Building 3 provides some opportunities for nesting birds due to gaps in the wood cladding and a gap above the doors providing access inside the building. However, no active nests were identified during this survey.

3.4.20. The survey area provides potential habitat for reptiles. The northern area provides shelter in the areas of scrub and the southern areas and surrounding playing fields provide basking sites. There is also an area of stone pile to the west of the bungalow. However, no reptiles were identified during any of the surveys of the site and there is only one record of reptiles in the surrounding area, a field record of a grass snake from 2013 which lies 1.2km to the south of the survey area. There are areas of more suitable habitat to the east of the survey area.

3.4.21. No suitable dormouse habitat was identified during this survey. The survey area is also outside the natural range of this species.

3.4.22. No red squirrels or red squirrel field signs were identified during this survey and there is no suitable habitat within the survey area. The survey area is also outside the natural range of this species.

3.4.23. No non-native invasive species of plant listed under Schedule 9 of The Wildlife and Countryside Act 1981 were identified within the survey area.

4. IMPACT ASSESSMENT, MITIGATION AND RESIDUAL EFFECTS.

4.1. Designated Sites.

4.1.1. *Impact Assessment.*

4.1.1.1. There are no records of designated sites within or surrounding the survey area. The nearest record is Bolton upon Dearne Wetlands Local Wildlife Site, which lies 675m to the south of the site. The proposed development will have **no negative impact** on this site.

4.1.1.2. Two SSSI sites, Bilham Sand Pits SSSI 3.85km to the northeast and Denaby Ings SSSI 4.8km to the southeast. Both SSSI's are a considerable distance from the survey area and the small, localised works will have **no negative impact** on this site.

4.1.1.3. The RSPB's Adwick Washlands Nature Reserve lies 720m to the southeast of the development site. Due to the distance between the development site and this nature reserve there will be no impact on the nature reserve. Also, the development site is surrounded on three sides by housing and a college and leisure centre and will not have an impact on bird flight to and from the nature reserve. There has yet been no response from the RSPB on the value of the nature reserve in relation to this development. However, the nature reserve is a long distance from the development site and the small, localised works will have **no negative impact** on this nature reserve.

4.1.2. *Mitigation.*

No mitigation relating to designated sites is required on the site.

4.1.3. *Residual Effects.*

There will be **no residual impact** on designated sites during the development.

4.2. Habitats.

4.2.1. Impact Assessment.

4.2.1.1. The main habitats on the site are scrub, tall ruderal and trees on the northern half of the site and heavily grazed and poor semi-improved grassland with a few scattered trees on the southern half of the site.

4.2.1.2. Overall, the northern half of the site is of moderate ecological value and the southern half of the site is on low ecological value. The whole site will be impacted by the proposed work. There is an area of public open space shown on the development plan at the northeast corner of the site and this is the area that the planning ecologist was most interested in preserving.

4.2.1.3. Biodiversity calculations were carried out using the Biodiversity Metric 3.0. The habitats baseline on the site was calculated at 14.20 Habitat Units as shown in the table below.

Habitat Type	Extent (ha)	Distinctiveness	Condition Assessment	Biodiversity units
Modified grassland	1.7	Low	Poor	3.40
Developed land; sealed surface	0.1	V.Low	N/A - Other	0.00
Mixed scrub	1.1	Medium	Moderate	8.80
Ruderal/Ephemeral	0.4	Low	Fairly Poor	1.20
Other woodland; broadleaved	0.1	Medium	Moderate	0.80
Total	3.40			14.20

4.2.1.6. The hedgerow baseline on the site was calculated at 0.15 Hedgerow Units as shown in the table below.

Hedge Type	Length (km)	Distinctiveness	Condition Assessment	Biodiversity units
Hedge Ornamental Non Native	0.03	V.Low	Poor	0.03
Native Hedgerow	0.05	Low	Poor	0.12
Total	0.08			0.15

4.2.2. Mitigation.

4.2.2.1. There is an area shown on the development plan at the northeast corner of the site that to be left as public open space. This area currently supports tall ruderal and scrub habitat. However, this area was previously identified as an area of semi-improved neutral grassland (**T6**). This habitat will be retained, and the semi-improved neutral grassland will be improved to enhance this habitat. Areas of scrub and scattered trees will also be retained and improved where necessary. This area will be managed, and enhancements incorporated into it in the form of wildflower planting, locally sourced native fruit and berry bearing trees and shrubs and native species hedgerows around the edge of this area. This area will also have a maintenance plan put in place to enhance and retain the grassland habitat. This will deliver 4.10 Habitat Units and is demonstrated in the table below.

Habitat Type	Extent (ha)	Distinctiveness Change	Condition Change	Biodiversity units
Grassland - Modified grassland	0.20	Low - V.High	Lower Distinctiveness Habitat - Good	2.13
Heathland and shrub - Mixed scrub	0.20	Medium - Medium	Moderate - Fairly Good	1.97
Total	0.40			4.10

4.2.2.2. At the southern end of the site there is to be a balancing feature. This area will be dry except in a very few instances and therefore, this will be planted out with good quality grassland and wild flowers to further enhance the biodiversity.

4.2.2.3. The site lies wholly within the Dearne Valley Green Heart Nature Improvement Area and the improved area of open space in the northeast corner of the site will provide enhancements to contribute to this area. This has been taken into account in the strategic significance within the Biodiversity Calculations.

4.2.3. Residual Effects.

4.2.3.1. Post-Development Biodiversity calculations were carried out using the Biodiversity Metric 3.0. The area habitats to be created on the site post development were calculated at 4.26 Habitat Units as shown in the table below.

Habitat Type	Extent (ha)	Distinctiveness	Condition Assessment	Biodiversity units
Lowland meadows	0.3	V.High	Good	1.60
Developed land; sealed surface	1.5	V.Low	N/A - Other	0.00
Vegetated garden	1.2	Low	Poor	2.66
Total	3.00			4.26

4.2.3.2. Post development Biodiversity calculations were carried out using the Biodiversity Metric 3.0. The linear habitats on the site post development were calculated at 2.79 Hedgerow Units as shown in the table below.

Hedge Type	Length (km)	Distinctiveness	Condition Assessment	Biodiversity units
Native Species Rich Hedgerow with trees	0.275	High	Good	2.79
Total	0.275			2.79

4.2.3.3. There will be an overall loss of 5.84 Habitat Units and an overall gain of 2.64 Hedgerow Units, therefore the residual impact of the development on habitats will be

a **Moderate Negative Residual Impact at Site Level**. This will be compensated for by providing off site Biodiversity.

4.3. Species – Bats.

4.3.1. Impact Assessment.

4.3.1.1. The buildings within the surveyed area provide a negligible potential for roosting bats. Therefore, there will be **no impact** on bats roosting during the proposed development.

4.3.1.2. The survey area provides low potential for foraging and commuting bats. There is little connecting vegetation between this site and the surrounding area. However, the housing around the site does provide some connectivity. The scrub habitat at the northern end of the site provides some foraging habitat for bats. The proposed works will not fragment any foraging habitat. However, some suitable foraging habitat will be removed having a moderate impact on foraging bats, if they use the site to forage. An area will remain at the northeast corner of the site as a public open space with a hedgerow suitable for foraging bats.

4.3.2. Mitigation.

4.3.2.1. A sensitive lighting plan will be implemented during the development ensuring a generally low level of lighting throughout the site. No lighting will be directed towards the site boundaries or Clark Beck retaining dark corridors in these areas to ensure there is no fragmentation of suitable foraging habitats.

4.3.2.2. There will be an area at the northeast corner of the site that to be public open space which will include areas of scrub, trees and semi-improved neutral grassland. This area will include wildflower planting, locally sourced native fruit and berry bearing trees and shrubs, native species hedgerows around the edge of this area.

4.4.3. Residual Effects.

4.4.3.1. There will be **No Residual Negative Impact** on roosting bats.

4.4.3.2. The residual impact on foraging bats will also be a **Low Negative Residual Impact** at a local level. The negative impact will predominantly be on the low

numbers of less light tolerant species present with the impact on common light tolerant species, such as Pipistrelle, being a potentially positive impact because such species will forage over the residential gardens on completion of the development.

4.4. Species – Birds.

4.4.1. Impact Assessment.

4.4.1.1. The vegetation within the surveyed area provides a suitable nesting habitat for various species of bird during the nesting season, which extends from March to September each year. No nests were identified during this survey although an abundance of bird activity was identified throughout the surveyed area implying that nests will be present.

4.4.1.2. Vegetation clearance works carried out during the nesting season will potentially have a **High Negative Impact** on nesting birds at a site level.

4.4.2. Mitigation.

All vegetation clearance works will be carried out outside the nesting season, which extends from March to September each year, or will be immediately preceded by a thorough nesting bird survey carried out by a suitably experienced surveyor.

4.4.3. Residual Effects.

There will be **No Negative Residual Impact** on nesting birds at a site level because there will be a large area of scrub and trees retained and enhanced and additional nest boxes will be included in the development. Common nesting habitats are found in abundance throughout the surrounding area.

5. COMPENSATION AND ENHANCEMENT MEASURES.

5.1. Biodiversity enhancements will be incorporated into the new development in the form of integrated bat boxes installed in at least 10% of the houses constructed on the site. Bird boxes, including integrated sparrow terraces will also be installed in at least 10% of the houses on the site and general bird boxes put up on trees around the site.

5.2. Integrated bat boxes will be installed in at least 10% of the houses constructed on the site. The integrated bat boxes will be the Habibat Bat Box with a custom facing or of a similar design. These boxes will be built into the walls of the buildings and are a permanent feature that require no maintenance. Photographs showing this design are shown below.



5.3. Swift boxes will be integrated into a number of the new buildings on the site to provide a permanent feature and will be of the design shown below, or similar. These can be custom faced to match the brickwork of the building.



5.4. General boxes will also be put up on trees around the site to provide nesting opportunities for a variety of bird species. These will include approximately ten boxes and include the Vivara Pro Seville 32mm WoodStone Nest Box and the Vivara Pro Seville 28mm WoodStone Nest Box, or similar. These are shown below.



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Appendix I. BAT INFORMATION.

Ecology

There are currently 18 species of bat residing in Britain, 17 of which are known to breed here. They are extremely difficult to identify in the hand and even more so in flight.

All appear to be diminishing in numbers, probably due to habitat change and shortage of food, caused by pesticides, as insects are their sole diet.

As their diet consists solely of insects, bats hibernate during the winter when their food source is at its most scarce. They will spend the winter in hollow trees, caves, mines and the roofs of buildings.

Certain species, particularly the pipistrelle (the commonest and most widespread British bat) can quickly adapt to man-made structures and will readily use these to roost and to rear their young.

Surveys

During walkover surveys, bat roosts can be identified by looking for:

- Suitable holes, cracks and crevices within any building, tree or other structure.
- Bat droppings along walls, window cills, or on the ground.
- Prey remains, such as insect wings.

Further investigations can be made using endoscopes, by carrying out aerial inspections of trees or by conducting bat activity surveys during dusk and dawn over summer months.

Legislation

Bats are protected under Appendix II and III of the Bern Convention (1982), Schedule 5 and 6 of the Wildlife and Countryside Act (1981), Annex IV of the Habitats Directive (some species under Annex II), Annex II of the Conservation of Habitats and Species Regulations (2010) and EUROBATs agreement. Numerous species are also listed under section 41 of the Natural Environment and Rural Communities Act (2006) making them species of principal importance.

All bats and their roosts are therefore protected in the UK. This makes it an offence to kill, injure or take any bat, to interfere with any place used for shelter or protection, or to intentionally disturb any animal occupying such a place.

The UK has designated maternity and hibernacula areas as Special Areas of Conservation (SAC's) under the Habitats Directive. Implementation of the UK Biodiversity Action Plan also includes action for a number bat species and the habitats which support them.

Where development proposals are likely to affect a bat roost site, a licence is required from Natural England.

Appendix II. GREAT CRESTED NEWT INFORMATION.

Ecology

Great Crested Newts breed in ponds and other water bodies. They can begin to migrate to their breeding ponds as early as the first frost-free days in late January with the majority reaching their breeding ponds by mid-March. Timing will be influenced by several factors, primarily evening temperatures above 5°C and rainfall.

The peak egg-laying period is from mid-March to mid-May. The newts will lay their eggs individually, mainly on the leaves of submerged plants. The larva hatch after three weeks and then take another 2-3 months to complete larval development. Adult newts generally leave their breeding ponds from late May onwards.

Once the larvae have completed metamorphosis (the transition from aquatic larvae, efts, to land-adapted juveniles), they emerge from the pond. This emergence begins in late August and generally continues until late October. It takes 2-4 years to reach sexual maturity, during which time the newts will be land based.

Adults and immature newts spend the winter in places that afford protection from frost and flooding. This will generally be underground amongst tree roots, in mammal burrows, or under suitable refuges above ground like deadwood or rubble piles. Hibernation may last from October to February.

Whilst on land, outside the hibernation period, great crested newts will forage at night, taking a wide range of invertebrate prey.

Great Crested Newts therefore spend the majority of their time on land and only visit the ponds for breeding purposes.

Great Crested Newts will travel large distances between ponds and terrestrial refuges. It is recommended that anywhere within 500m of a pond should be treated as potential Great Crested Newt habitat.

Surveys

Walkover surveys will identify the suitability of any ponds within the area for Great Crested Newts by using a HSI assessment. The terrestrial habitat and their links will also be assessed.

Aquatic surveys of newts can be carried out through the trapping of ponds in suitable weather conditions during the breeding season, although these surveys do not provide accurate population estimates.

Terrestrial surveys and exclusions can be conducted between March and September when newts are moving out of breeding ponds.

An experienced surveyor must carry out the surveys and must be in possession of an appropriate Natural England Great Crested Newt survey license.

It is essential that Great Crested Newt surveys are planned well in advance of any development and ideally before Planning Consent is sought. Surveys can only be carried out at the appropriate time of year and repeat surveys are essential.

Legislation

Great Crested Newts are protected under Appendix II of the BERN Convention (1982), Schedule 5 of the Wildlife and Countryside Act (1981), Annex II and IV of the Habitats Directive, Annex II of the Conservation and Wildlife Regulations (2010) and are listed under section 41 of the Natural Environment and Communities Act (2006) making them a species of principal importance.

This makes it an offence to kill, injure or take any Great Crested Newt, to interfere with any place used for shelter or protection, or to intentionally disturb any animal occupying such a place.

If Great Crested Newts are to be affected by any development, a thorough assessment of the population is essential followed by the design of a comprehensive mitigation package. Only when this has been done can a license application be submitted to Natural England for approval. It takes 30 working days for a license application to be determined and the period that mitigation measures take can be measured in months. It is therefore essential to plan well in advance of development commencing.

Appendix III. NESTING BIRD INFORMATION.

Ecology

The nesting season will vary according to the weather each year but generally commences in March, peaks during May and June and continues until September. It is also worth remembering that some birds nest in trees and scrub, but others are ground nesting or prefer man-made structures or buildings.

Surveys

Nesting bird surveys search for potential nest sites in vegetation, buildings etc. Potential nesting sites are observed over a suitable period of time for bird movements or calling male birds that would indicate the presence of a nest. The presence of a nest can be identified from the field signs without the necessity to see the nest itself, thereby avoiding any disturbance of the nests. The best way to avoid this issue is to plan for vegetation clearance to be carried out outside the bird-nesting season.

Legislation

Nesting birds are protected under The Wildlife and Countryside Act 1981.

Part 1. -(1) Of the Act states that: - If any person intentionally: - kills, injures or takes any wild bird; takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or takes or destroys an egg of any wild bird, he shall be guilty of an offence.

Part 1.-(5) of the Act states that:- If any person intentionally:- disturbs any wild bird included in Schedule 1 while it is building a nest or is in, on, or near a nest containing eggs or young; or disturbs young of such a bird, he shall be guilty of an offence and liable to a special penalty.

The Countryside and Rights of Way Act 2000 amends the above by inserting after “intentionally” the words “or recklessly”.

Appendix IV. REPTILE INFORMATION.

Ecology

There are five main species of reptile that reside in the UK; Common or Viviparous Lizard (*Lacerta vivipara*); Sand Lizard (*Lacerta agilis*); Slow Worm (*Anguis fragilis*); Grass Snake (*Natrix natrix*) and Adder (*Vipera berus*). The Adder is the only native species that is venomous although this is rarely harmful to humans.

Reptiles occupy a wide range of habitats including woodland, marshes, heathland, moors, sand dunes, hedgerows and bogs. Sand Lizards are confined to moorland and coastal sand dunes where they lay their eggs in the warm sand. The range of the Sand Lizard in the UK is therefore very limited. Slow Worms can be found in a wide variety of habitats throughout Britain and is the most likely reptile to be found in urban and suburban environments.

Maintaining the right body temperature is vital to reptiles' survival. In the morning, they find a warm basking site to heat up their bodies, then later they may move back into the shade because they do not sweat and have to be careful not to overheat. During hot summers, Adders will try to move to damper, cooler sites.

Over winter reptiles will hibernate in burrows or under logs where they are protected from the cold and predators, emerging from February onwards as the weather warms up.

Reptiles generally begin to mate April to May with young born in late July to September. The Common Lizard gives birth to live young, hence the term viviparous, meaning live bearing.

Surveys

Reptile surveys involve the searching of refuge such as logs and stones for any animal sheltering below. Artificial refuge may be laid out on site for the purpose of reptile surveys.

Legislation

Reptiles are protected under Appendix II (sand lizards) and Appendix III (common lizard, slow worms, smooth snake, grass snake and adders) of the BERN Convention (1982), partially protected under Schedule 5 of the Wildlife and Countryside Act (1981), Annex IV of the Habitats Directive and are all listed under section 41 of the Natural Environment and Communities Act (2006) making them a species of principal importance.

This makes it an offence to disturb any reptile while it is occupying a structure or place it uses for shelter or protection or to obstruct access to such a place.

APPENDIX V. HABITAT SUITABILITY INDEX INFORMATION.



Amphibian and Reptile Groups of the United Kingdom ARG UK Advice Note 5

www.arguk.org

Great Crested Newt Habitat Suitability Index

May 2010

Background

The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham *et al.* (2000). HSI scoring systems were originally developed by the US Fish and Wildlife Service as a means of evaluating habitat quality and quantity. An HSI is a numerical index, between 0 and 1. Values close to 0 indicate unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors known to affect this species. These ten suitability indices are retained in this current Advice Note.

In the HSI system proposed by Oldham *et al.* (2000) one of the suitability indices (SI₉, terrestrial) involves more lengthy measurement and calculation than the others. In using the HSI system with volunteer surveyors in Kent, Lee Brady has substituted a simpler evaluation of terrestrial habitat quality (a four-point scale), for ease of use.

Several other, local, surveys have utilised the HSI, but incorporating their own variations on the original system. In 2007 a workshop was held at the Herpetofauna Workers' Meeting to evaluate the use of the HSI for the great crested newt, with the aims of:

- Identifying components of the system that may need clarification or refinement
- Agreeing on a standard that can readily be used by volunteers and professionals alike.

The outputs of the workshop and subsequent consultation have been used to formulate the current Advice Note. As far as possible a conservative approach has been adopted in modifying the use of the original HSI suitability indices. However, a major departure is the adoption of Lee Brady's four-point evaluation of terrestrial habitat. This differs from the original HSI in that it has been developed with respect to newt presence/absence at a pond, rather than estimating population size.

Use and limitations of the HSI

The HSI for great crested newts is a measure of habitat suitability. **It is not a substitute for newt surveys.** In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any particular pond with a high score will support newts, or that any pond with a low score will not do so.

There is a positive correlation between HSI scores and the numbers of great crested newts observed. In general, high HSI scores are likely to be associated with greater numbers of great crested newts. The relationship is not sufficiently strong, however, to allow estimations of the numbers of newts in any particular pond.

HSI scoring can be useful in:

- Evaluating the general suitability of a pond, or ponds, for great crested newts
- Comparing general suitability of ponds across different areas
- Evaluating the suitability of receptor ponds in a proposed mitigation scheme
- Identifying habitat management priorities.

How to collect data and calculate the HSI

The HSI is a geometric mean of ten suitability indices:

$$HSI = (SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$$

- Ten factors are scored for a pond, in the field and from map work (field scores).
- The ten field scores are converted to SI scores, on a scale from 0.01 to 1 (0.01 is used as the lower end of the scale instead of 0, because multiplying by 0 reduces all other SI scores to 0).
- The ten SI scores are multiplied together.
- The tenth root of this number is calculated ($x^{1/10}$ i.e. x to the power of 0.1).

The calculated HSI for a pond should score between 1 and close to 0 (the calculations above do not allow the HSI to be exactly 0).

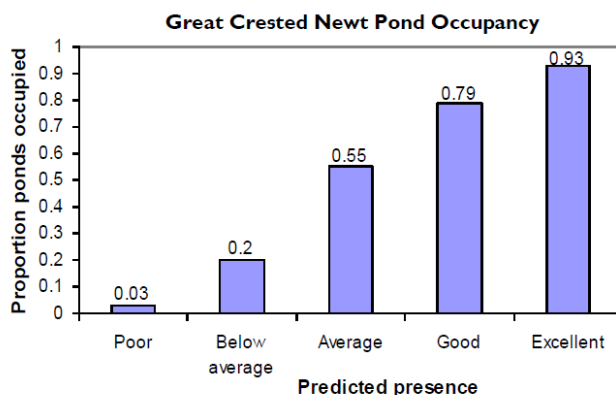
Some of the field scores are categorical, some are numerical. The numerical field scores are converted to SI scores by reading off the values from graphs produced by Oldham *et al.* (2000) reproduced in this Advice Note.

Full details of the scoring system, including descriptions of the criteria used in the categorical scores are given in *Details of suitability indices and definitions of categories* (below). Scores for two of the factors (SI_1 and SI_8) can be gained as desktop/map exercises and so do not have to be completed in the field. The remaining factors should be recorded as field scores, and later converted to suitability indices, in some cases reading SI scores from the graphs provided. A summary of data to collect is given in the appendix *Summary of scoring system*.

Categorisation of HSI scores

Lee Brady has developed a system for using HSI scores to define pond suitability for great crested newts on a categorical scale:

HSI	Pond suitability
< 0.5	= poor
0.5-0.59	= below average
0.6-0.69	= average
0.7-0.79	= good
> 0.8	= excellent



The graph shows occupancy of ponds by great crested newts in south-east England. 248 ponds were surveyed on three to six occasions, using egg-searching, torching and bottle-trapping. As pond suitability increases from 'poor' to 'excellent', so does the proportion of ponds occupied by great crested newts.

Details of suitability indices and definitions of categories

Factor 1. Geographic location (SI_1)

Sites should be scored according to the zone in which they occur. This scoring can be carried out either in the field, or as part of a desktop exercise.

Zone A, location is optimal, $SI = 1$

Zone B, location is marginal, $SI = 0.5$

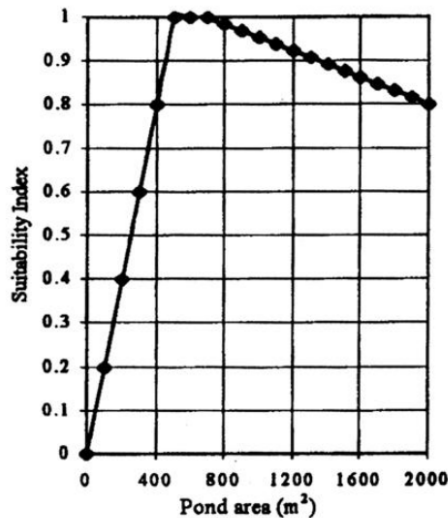
Zone C, location is unsuitable, $SI = 0.01$.

Some sites will fall on boundary lines between zones. In such cases, select medium-value scores i.e. Zone B.



Factor 2. Pond area

Pond area is the surface area of the pond when water is at its highest level (excluding flooding events). This is usually in the spring. If the pond is being measured at another time of year, the spring time area should still be evident from vegetation types and evidence of a draw down zone around the pond.



Pond area should be measured as accurately as possible. There are several ways of doing this, for example by measuring axes of regularly shaped ponds, either by pacing out in the field, or taking measurements from a map. Irregularly shaped ponds may have to be treated as a series of geometric shapes, calculating the area for each and adding together.

Since it can be difficult reading off SI scores from the graph, pond area should be rounded to the nearest 50 m².

It can be particularly difficult to read off SI scores for very small ponds. For ponds smaller than 50 m² use a score of 0.05.

For ponds larger than 2000 m² omit this factor from the HSI calculation (as there are no data for such large ponds).
i.e. $HSI = (SI_1 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/9}$.

Factor 3. Permanence

Pond permanence should be deduced from local knowledge and personal judgement. A landowner may know how often a pond dries. However, if not, the surveyor should make a judgement based on water level at the time of the survey, and taking seasonality into consideration. For example, a pond that is already dry by late spring is likely to dry out every year, etc.

Category	SI	Criteria
Never dries	0.9	Never dries.
Rarely dries	1.0	Dries no more than two years in ten or only in drought.
Sometimes dries	0.5	Dries between three years in ten to most years.
Dries annually	0.1	Dries annually.

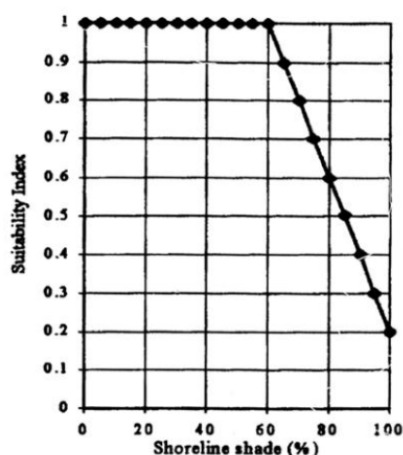
Factor 4. Water quality

The assessment of water quality is subjective and should be based on invertebrate diversity, the presence of submerged water plants and knowledge of the water sources feeding the pond. Water quality should not be confused with water clarity. Sometimes clear water can be devoid of invertebrates, and turbid ponds can support a wealth of invertebrates. There is no quick and simple invertebrate index of water quality. However, some species are indicators of water quality.

Category	SI	Criteria
Good	1.0	Water supports an abundant and diverse invertebrate community. Netting reveals handfuls of diverse invertebrates, including groups such as mayfly larvae and water shrimps.
Moderate	0.67	Moderate invertebrate diversity
Poor	0.33	Low invertebrate diversity (e.g. species such as midge and mosquito larvae). Few submerged plants.
Bad	0.01	Clearly polluted, only pollution-tolerant invertebrates (such as rat-tailed maggots), no submerged plants.

Other cues may also provide information about water quality. For example, ponds subject to agricultural inputs are likely to have poor water quality.

Factor 5. Shade



Estimate percentage pond perimeter shaded, to at least 1m from the shore. Shading is usually from trees, but can include buildings. Shading should not include emergent pond vegetation. The estimate should be made during the period from May to the end of September.

Factor 6. Waterfowl

This factor is concerned with the impact of waterfowl upon the pond and newts. At high densities, as created when waterfowl are encouraged to use a pond by provision of food, the birds can remove all aquatic vegetation, pollute water and persistently stir sediments. Some waterfowl may also actively hunt adult newts and their larvae. Score as one of three categories.

Category	SI	Criteria
Absent	1	No evidence of waterfowl impact (moorhens may be present).
Minor	0.67	Waterfowl present, but little indication of impact on pond vegetation. Pond still supports submerged plants and banks are not denuded of vegetation.
Major	0.01	Severe impact of waterfowl. Little or no evidence of submerged plants, water turbid, pond banks showing patches where vegetation removed, evidence of provisioning waterfowl.

'Waterfowl' includes most water birds, such as ducks, geese and swans. Moorhens should be excluded because almost every pond has at least one or two.

Factor 7. Fish

Information on fish should be gleaned from local knowledge and the surveyor's own observations. Pond owners will usually be aware of stocking with fish for commercial or aesthetic reasons. However, stickleback (which can be significant predators of great crested newt larvae, when present in large numbers) are unlikely to be deliberately introduced to a pond, but may arrive through other means. Netting is useful in detecting smaller fish, such as sticklebacks, or the fry of larger species.

Category	SI	Criteria
Absent	1	No records of fish stocking and no fish revealed by netting or observed by torchlight.
Possible	0.67	No evidence of fish, but local conditions suggest that they may be present.
Minor	0.33	Small numbers of crucian carp, goldfish or stickleback known to be present.
Major	0.01	Dense populations of fish known to be present.

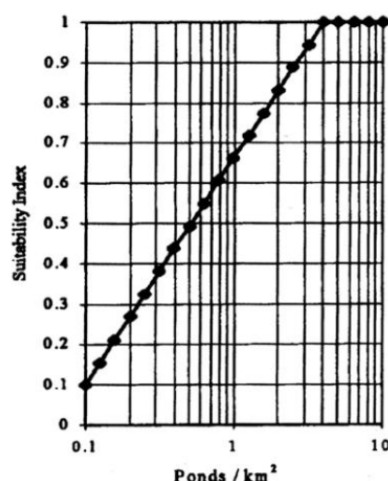
Factor 8. Pond count

This is the number of ponds occurring within 1 km of survey pond. Do not count the survey pond itself. Ponds on the far side of major barriers, such as main roads, should not be counted. Use 1:25,000 scale O.S. data, such as Explorer maps, GIS or web-based mapping sources, such as:

Getamap www.ordnancesurvey.co.uk/oswebsite/getamap/
 Magic www.magic.gov.uk/site_map.html
 Digimap edina.ac.uk/digimap/

Pond counts can be carried out by a survey coordinator and so do not necessarily have to be performed by surveyors.

Divide the number of ponds by π (3.14) to calculate the density of ponds per km² and read off the SI value from graph.



Factor 9. Terrestrial habitat

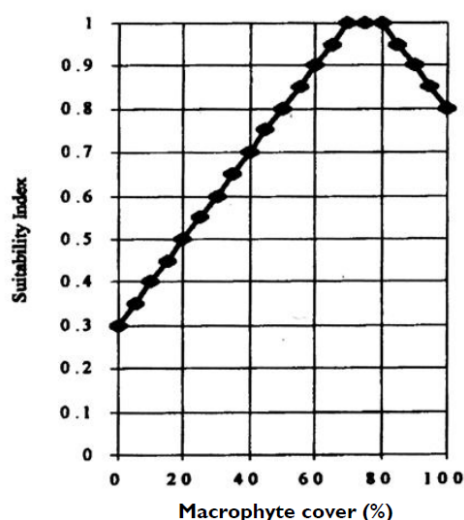
Scoring terrestrial habitat depends on the surveyor's understanding of newt habitat quality. Good terrestrial habitat offers cover and foraging opportunities and includes meadow, rough grassland with tall sward height, scrub, woodland or mature gardens. Terrestrial habitat should be considered within approximately 250 m from the pond, but only on the near side of any major barriers to dispersal (e.g. main roads or large expanses of bare habitat).

Category	SI	Criteria
Good	1	Habitat that offers good opportunities for foraging and shelter (e.g. most semi-natural environments, such as rough grassland, scrub or woodland, also brownfield sites and low intensity farmland) covers more than 75% of available area.
Moderate	0.67	Habitat offers opportunities for foraging and shelter but may not be extensive (25-75%) of available area.
Poor	0.33	Habitat with poor structure (e.g. amenity grassland, improved pasture and arable) that offers limited opportunities (less than 25% of available area) for foraging and shelter.
None	0.01	No suitable habitat around pond (e.g. centre of arable field or large expanse of bare habitat).

Great crested newts do not have specific terrestrial habitat requirements. However, good quality terrestrial habitat has structure. The presence of hedges, ditches, stone walls, old farm buildings, piles of loose stone or rock, rabbit burrows and small mammal holes all contribute towards 'good' terrestrial habitat. Note that it is rare to encounter a pond falling within the terrestrial habitat category of 'none'.

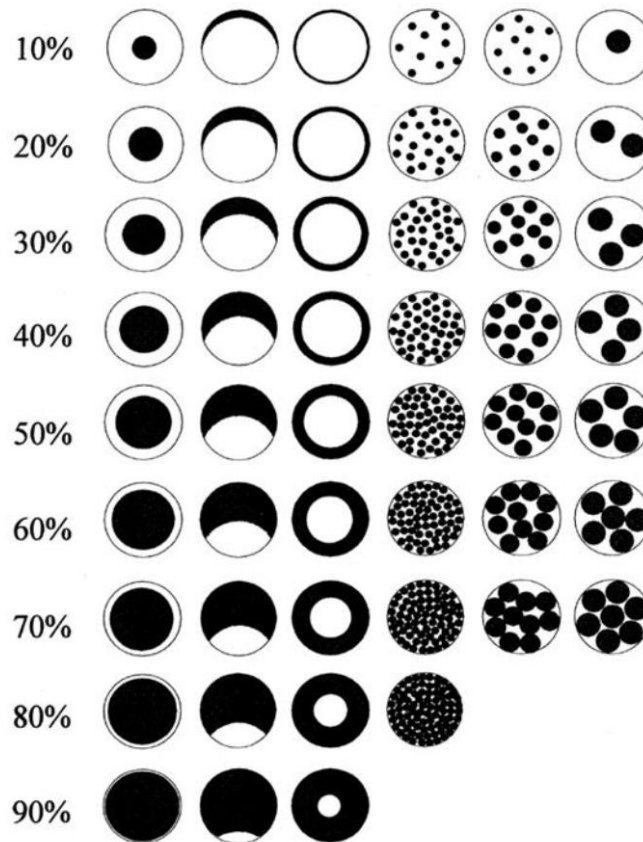
Factor 10. Macrophytes

Estimate the percentage of the pond surface area occupied by macrophyte cover. This includes emergents, floating plants (excluding duckweed) and submerged plants reaching the surface. Make an estimate between March and the end of September. Read off the SI value from graph.



Guide for assessment of macrophyte cover in a pond

The areas of dark shading simulate a variety of vegetation dispersion patterns.



Reference

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

This Advice Note is an output from a workshop held at the Herpetofauna Workers' Meeting in January 2007. ARG UK is grateful to Lee Brady, Rob Oldham, David Sewell and John Baker for leading the workshop and/or contributing to this note, and workshop participants for providing useful suggestions. ARG UK is also grateful to the British Herpetological Society for permission to use graphics from the original paper on HSI, published in the *Herpetological Journal*.

This Advice Note can be downloaded from the ARG UK website www.arguk.org and should be cited as: ARG UK (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

Publication date: May 2010.

ARG UK is the network of volunteer conservation groups concerned with the native amphibians and reptiles of the UK.



amphibian and reptile
conservation



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ef Esmée
Fairbairn
FOUNDATION



Summary of scoring system

SI₁ Location

Field score	SI
A (optimal)	1
B (marginal)	0.5
C (unsuitable)	0.01

SI₂ Pond area

Field score	SI
Measure pond surface area (m ²) and round to nearest 50 m ²	Read off graph.

SI₃ Pond drying

Field score	SI	Criteria
Never	0.9	Never dries
Rarely	1.0	Dries no more than two years in ten or only in drought.
Sometimes	0.5	Dries between three years in ten to most years
Annually	0.1	Dries annually

SI₄ Water quality

Field score	SI	Criteria
Good	1.0	Abundant and diverse invertebrate community.
Moderate	0.67	Moderate invertebrate diversity
Poor	0.33	Low invertebrate diversity, few submerged plants
Bad	0.01	Clearly polluted, only pollution-tolerant invertebrates, no submerged plants.

SI₅ Shade

Field score	SI
Estimate percentage perimeter shaded to a least 1 m from shore.	Read off graph.

SI₆ Fowl

Field score	SI	Criteria
Absent	1	No evidence of water fowl (although moorhen may be present)
Minor	0.67	Waterfowl present, but little sign of impacts
Major	0.01	Severe impact of waterfowl

SI₇ Fish

Category	SI	Criteria
Absent	1	No records of fish stocking and no fish revealed during survey.
Possible	0.67	No evidence of fish, but local conditions suggest that they may be present.
Minor	0.33	Small numbers of crucian carp, goldfish or stickleback known to be present.
Major	0.01	Dense populations of fish known to be present.

SI₈ Pond count

Field score	SI
Count the number of ponds within 1 km of the survey pond (not separated by major barriers) and divide by 3.14. This can be done from maps rather than in the field.	Read off graph.

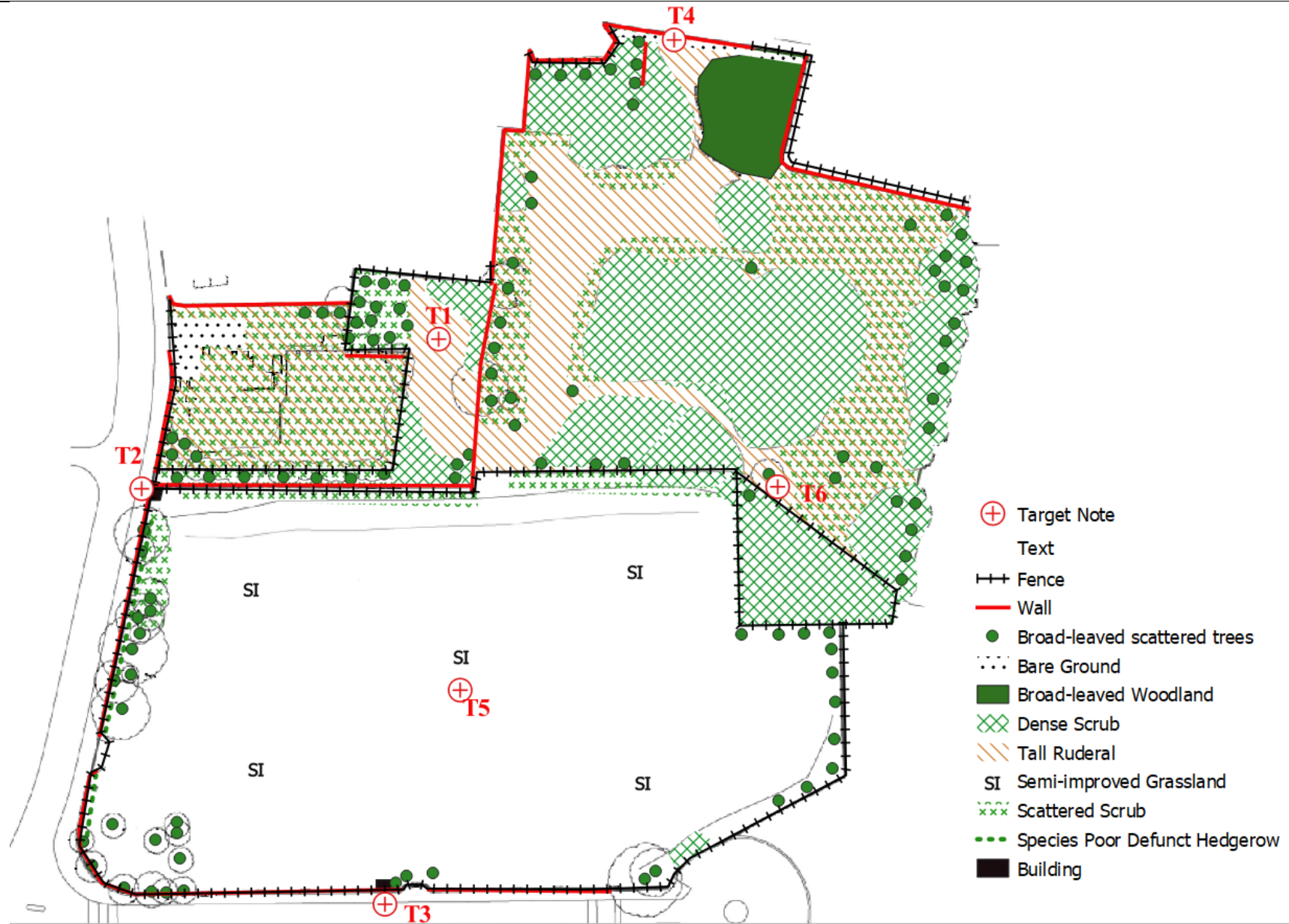
SI₉ Terrestrial habitat

Category	SI
Good	1
Moderate	0.67
Poor	0.33
None	0.01

SI₁₀ Macrophytes

Field score	SI
Estimate the percentage of the pond surface area occupied by macrophyte cover (between May and the end of September)	Read off graph.

Appendix VI. ANNOTATED MAP OF THE SURVEY AREA.



Reference: 180977/2021

Prepared by: Whitcher Wildlife Ltd

Site: Goldthorpe Road

Date: 6th October 2021



Appendix VII. TARGET NOTES.

T1 – The location of what was Building 1, the bungalow, which was demolished approximately 1 year ago.

T2 – Building 2, the substation with **negligible** bat roost potential.

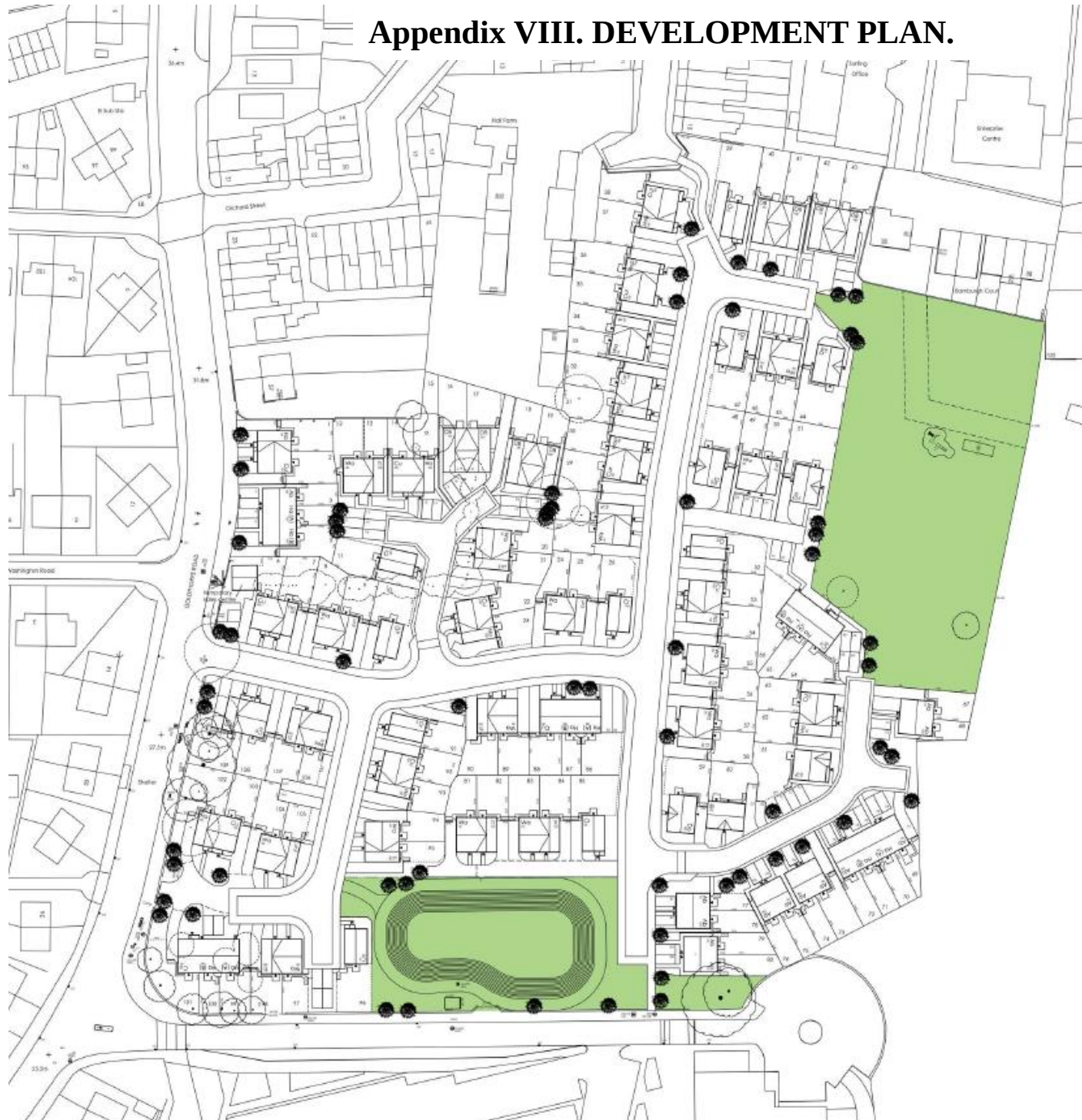
T3 – Building 3, the small building with **negligible** bat roost potential.

T4 – The area being used as a vegetable patch by the adjacent property.

T5 – The area heavily grazed by horses.

T6 – The area previously assessed in *Report (364 – GAT20)* as an area of semi-improved grassland that is now a small area of grassland transitioning to tall ruderal and scrub habitats.

Appendix VIII. DEVELOPMENT PLAN.



All work to be carried out in accordance with the requirements of the Building Regulations, Water Authority and the Development (Design and Management) Regulations currently in force.

Do not scale from this drawing. Architects to be notified of any discrepancies.

Verify relevant dimensions on site before commencing work or preparing shop drawings. This drawing is copyright.

Rev	Date	Description	By
A	06/09/18	Layout amended following pre-app meeting with planners	JMB
B	04/10/18	Layout amended to accommodate existing ecological features	JMB
C	14/01/19	Layout amended to accommodate highway planners comments	JMB
D	20/01/19	Plan amended to address public consultation comments	JMB
E	04/03/19	Plan amended to address highway planners comments	JMB
F	20/03/19	Plan amended to address highway planners comments	JMB
G	12/10/21	Layout amended to address highway planners comments	JMB
H	06/12/21	Layout amended to address highway planners comments	JMB
I	06/12/21	Layout amended to address highway planners comments	JMB
J	11/01/22	Layout amended to address highway planners comments	JMB



W Redmile & Son Ltd, Parkfield House, 118 Adeney Road, Sheffield, S2 4AG.
Tel: 0114 2299000 Fax: 0114 2299001 www.redmile.co.uk

Scale: 1:500 | drawn by: JMB | date: June 18

Project: Land off Goldthorpe Road, Goldthorpe, Barnsley

Drawing: Site Layout

Drawing Number: GT/SK-01 | Revision: K

Appendix IX. BILHAM SAND PITS SSSI CITATION.

Date Notified: 17 September 1987

File ref: SE 40/4

County: South Yorkshire Site Name: Bilham Sand Pits

District: Doncaster

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981.

Local Planning Authority: Doncaster

National Grid Reference: SE 487066 Area: 0.19 (ha) 0.08 (ac)

Ordnance Survey Sheet 1:50,000: 111 1:10,000: SE 40 NE

Date Notified (Under 1981 Act): 1987 Date of last revision: –

Other Information:

This is a new site.

Description:

This site lies $\frac{1}{2}$ mile north of the village of Hickleton to the west of Doncaster, overlying Permian sediments.

The basal Permian sands are more patchily developed in the Yorkshire Province than in the Durham Province and Bilham provides an excellent section through the sands and overlying limestones of the Cadeby formation (Zechstein Cycle 1). The lower part of the Cadeby Formation yields an abundant but, in terms of species, restricted shelly fauna, including *Bakewellia* and *Schizodus*. This is one of a very few sites in this part of the Zechstein Basin showing the basal Magnesian Limestone overlying non-marine Permian sediments.

Appendix X. DENABY INGS SSSI CITATION.

Date Notified: 17 September 1987

File ref: SE 40/4

County: South Yorkshire Site Name: Bilham Sand Pits

District: Doncaster

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981.

Local Planning Authority: Doncaster

National Grid Reference: SE 487066 Area: 0.19 (ha) 0.08 (ac)

Ordnance Survey Sheet 1:50,000: 111 1:10,000: SE 40 NE

Date Notified (Under 1981 Act): 1987 Date of last revision: –

Other Information:

This is a new site.

Description:

This site lies ½ mile north of the village of Hickleton to the west of Doncaster, overlying Permian sediments.

The basal Permian sands are more patchily developed in the Yorkshire Province than in the Durham Province and Bilham provides an excellent section through the sands and overlying limestones of the Cadeby formation (Zechstein Cycle 1). The lower part of the Cadeby Formation yields an abundant but, in terms of species, restricted shelly fauna, including *Bakewellia* and *Schizodus*. This is one of a very few sites in this part of the Zechstein Basin showing the basal Magnesian Limestone overlying non-marine Permian sediments.

Date Notified: 17 September 1987

File ref: SE 40/4

County: South Yorkshire Site Name: Bilham Sand Pits

District: Doncaster

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981.

Local Planning Authority: Doncaster

National Grid Reference: SE 487066 Area: 0.19 (ha) 0.08 (ac)

Ordnance Survey Sheet 1:50,000: 111 1:10,000: SE 40 NE

Date Notified (Under 1981 Act): 1987 Date of last revision: –

Other Information:

This is a new site.

Description:

This site lies ½ mile north of the village of Hickleton to the west of Doncaster, overlying Permian sediments.

The basal Permian sands are more patchily developed in the Yorkshire Province than in the Durham Province and Bilham provides an excellent section through the sands and overlying limestones of the Cadeby formation (Zechstein Cycle 1). The lower part of the Cadeby Formation yields an abundant but, in terms of species, restricted shelly fauna, including *Bakewellia* and *Schizodus*. This is one of a very few sites in this part of the Zechstein Basin showing the basal Magnesian Limestone overlying non-marine Permian sediments.

Appendix XI. eDNA RESULTS.



Folio No: E4778
Report No: 1
Order No: 180977
Client: WHITCHER WILDLIFE LTD
Contact: Jenny Roebock
Contact Details: jenny@whitcher-wildlife.co.uk,
jenny@whitcher-wildlife.co.uk
Date: 13/05/2019

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

Date sample received at Laboratory: 29/04/2019
Date Reported: 13/05/2019
Matters Affecting Results: None

RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
1002	Goldthorpe Road	SE 46600 03521	Pass	Pass	Pass	Negative	0

SUMMARY

When Great Crested Newts (GCN); *Triturus cristatus* inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

The water samples detailed below were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Latest Amendments). Details on the sample submission form were used as the unique sample identity.

RESULTS INTERPRETATION

Lab Sample No.- When a kit is made it is given a unique sample number. When the pond samples have been taken and the kit has been received back in to the laboratory, this sample number is tracked throughout the laboratory.

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
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Company Registration No. 08950940

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Site Name- Information on the pond.

O/S Reference - Location/co-ordinates of pond.

SIC- Sample Integrity Check. Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.

DC- Degradation Check. Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.

IC- Inhibition Check- PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

Result- NEGATIVE means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence. POSITIVE means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed. Positive or Negative.

Positive Replicates- To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. 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.

METHODOLOGY

The laboratory testing adheres to strict guidelines laid down in WC1067 Analytical and Methodological Development for Improved Surveillance of The Great Crested Newt, Version 1.1

The analysis is conducted in two phases. The sample first goes through an extraction process where all six tubes are pooled together to acquire as much eDNA as possible. The pooled sample is then tested via real time PCR (also called q-PCR). This process amplifies select part of DNA allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines PCR amplification and detection into a single step. This eliminates the need to detect products using gel electrophoresis. With qPCR, fluorescent dyes specific to the target sequence are used to label PCR products during thermal cycling. The accumulation of fluorescent signals during the exponential phase of the reaction is measured for fast and objective data analysis. The point at which amplification begins (the Ct value) is an indicator of the quality of the sample. True positive controls, negatives and blanks as well as spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared so they act as additional quality control measures.

The primers used in this process are specific to a part of mitochondrial DNA only found in GCN ensuring no DNA from other species present in the water is amplified. The unique sequence appropriate for GCN analysis is quoted in DEFRA WC 1067 and means there should be no detection of closely related species. We have tested our system exhaustively to ensure this is the case in our laboratory. We can offer eDNA analysis for most other species including other newts.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. Kits are manufactured by SureScreen Scientifics to strict quality procedures in a separate building and with separate staff, adopting best practice from WC1067 and WC1067 Appendix 5. Kits contain a 'spiked' DNA marker used as a quality control tracer (SureScreen patent pending) to ensure any DNA contained in the sampled water has not deteriorated in transit. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

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Company Registration No. 08950940

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SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory checks on accuracy of results as part of our quality procedures.

Reported by: Chris Troth

Approved by: Troy Whyte

End Of Report

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