

GREAT CRESTED NEWT SURVEY



LAND AT SHAFTON TWO GATES, SOUTH YORKSHIRE



**Report No 1
Draft
July 2013**



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Client	Revision	Status	Date	Author	Proof Read	Checked
ENGENA Ltd	R01	Draft	24/07/13	JS	EB	MEM
Job No. 3211						

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SUMMARY

E³ Ecology Ltd was commissioned by Engena Ltd to undertake a great crested newt survey of ponds surrounding an area of reclaimed land at Shafton Two Gates, east of Cudworth, Barnsley, to accompany a planning application. It is proposed to construct a single turbine and associated infrastructure.

The turbine will stand within an area of semi improved grassland considered to be of moderate value to local amphibian populations. Site access will be gained through the construction of an access track extending from an existing track to the north east.

The proposed development field is surrounded by similar semi improved grassland with areas of immature broadleaf plantation, regenerating scrub and a number of ponds found readily in the vicinity. The surrounding land comprises arable fields to the west, similar grassland to the north and south with industrial development and brownfield land to the east. The access track onto the site runs through semi improved grassland and utilises an existing track.

There are a number of ponds in the wider area with 6 recorded within 250m and a further 2 within 500m. Consultation highlighted the presence of great crested newts within the ponds to the west, approximately 100m distant from the turbine location. The ponds vary in their suitability to support great crested newts but are generally above average based on their HSI scores.

Survey recorded small numbers of great crested newts within 2 ponds to the west of the site, within 250m of the site boundary, however no great crested newts were recorded within the other ponds within the survey area.

Given the results of the survey, the nature and suitability of the ponds, distance from the site, size of the site, habitats recorded on site and linkages between the ponds and the site it is considered that the proposals will have the following impacts on the species:

- A moderate risk of causing harm or disturbance to individual great crested newts in their terrestrial phase.
- A loss of small amounts of optimal habitat to the development that is likely to provide a foraging resource to the local population.
- A limited impact on dispersal routes between the breeding ponds and the local area as a result of the development.
- No breeding ponds will be lost to the proposals.

In order to address the above impacts, the following mitigation and compensation strategy will be employed:

- All works on site will proceed to a detailed method statement in order to minimise the risk of causing harm to great crested newts.

The local planning authority and Natural England are likely to require the means of delivery of the mitigation to be identified. It is recommended that mitigation and enhancement proposals are incorporated into the master-planning documents.

If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E3 Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.

A INTRODUCTION

E³ Ecology Ltd was commissioned by Engena Ltd to undertake a great crested newt survey of an area of reclaimed land at Shafton Two Gates, east of Cudworth, Barnsley, to accompany a planning application. It is proposed to erect a single wind turbine on site with associated infrastructure.

A.1 Background to Development

The proposed development site is situated approximately 0.6km to the east of Cudworth, Barnsley, within an area of semi improved grassland at approximate grid reference: SE 399 084. Its location is illustrated below in figures 1 and 2.

The development will be accessed via a newly constructed access track leading from an existing track to the north east of the turbine location.

Figure 2, below, illustrates the adjacent land use with the circle delineating a 1km radius from the proposed turbine location.



Figure 1 Site plan and location

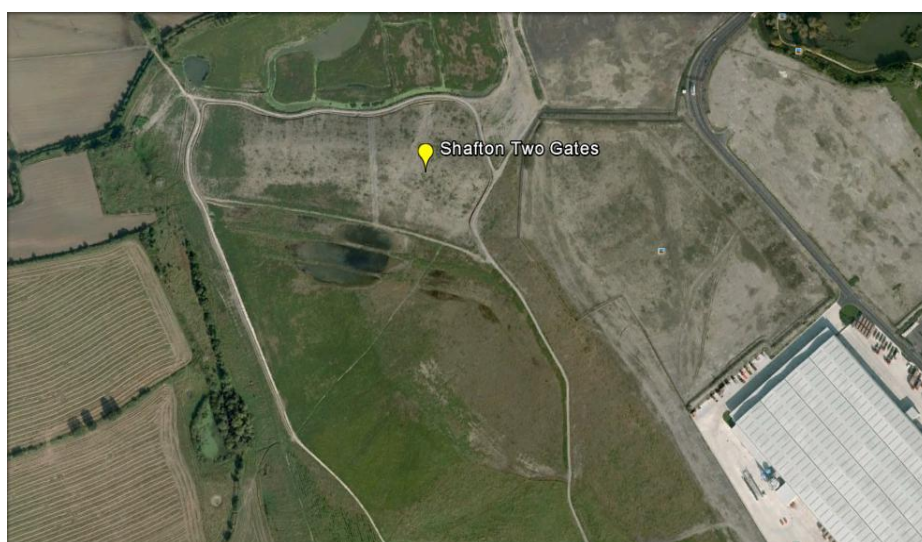


Figure 2: Aerial Photo – Wider Area (Reproduced under licence from Google Earth Pro)

A.2 Personnel

Survey work and reporting was undertaken by:

- James Streets BSc MSc MCIEEM
- Jonathon Pounder

The project was supervised by:

- Mary Martin BSc MCIEEM

Details of experience and qualifications are available at www.e3ecology.co.uk.

A.3 Objectives of Study

To determine the presence or otherwise of great crested newts, the value of the habitats on site to the species, the extent that they may be affected by the proposed development and, where necessary, to develop mitigation proposals that will allow development to proceed without significant adverse ecological effect.

B RELEVANT LEGISLATION AND PLANNING CONTEXT

B.1 National Planning Policy Framework

The Government's National Planning Policy Framework (NPPF) states the following:

- Plan policies and planning decisions should be based upon up-to-date information about the natural environment (Paragraph 158 and 165).
- Plan policies should promote the preservation, restoration and recreation of priority habitats, ecological networks and the recovery of priority species (Paragraph 117).
- Local planning authorities should set out a strategic approach in their Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. (Paragraph 114).
- When determining planning applications in accordance with the Local Plan and the presumption in favour of sustainable development local planning authorities should aim to conserve and enhance biodiversity by applying a number of principles, including if significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused. (Paragraph 118).

B.2 Protected Species Legislation

Within England, great crested newts are specially protected under the Conservation of Habitats and Species Regulations (2010) and under Schedule 5 of the Wildlife and Countryside Act of 1981 (as amended).

As a result there is a requirement to consult with Natural England before undertaking any works that may disturb great crested newts, or damage their breeding ponds, hibernacula or refugia, and under the Conservation of Habitats and Species Regulations it is illegal to.

- Deliberately kill, injure or capture great crested newts.
- Deliberately disturb great crested newts, particularly 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) to hibernate; or
 - (b) to affect significantly the local distribution or abundance of the species.
- Deliberately take or destroy great crested newt eggs.
- Deliberately obstruct access to a great crested newt breeding pond, hibernacula or refugia.
- Damage or destroy a great crested newt breeding pond, hibernacula or refugia.

Under the Wildlife and Countryside Act (1981) the above offence of disturbing great crested newts includes low level disturbance and as such under this act it is also an offence to:

- Intentionally or recklessly disturb a great crested newt while it is occupying a breeding pond, hibernacula or refugia.

- Intentionally or recklessly obstruct access to a breeding pond, hibernacula or refugia.

Under the above legal protection, only the offences under the Conservation of Habitats and Species Regulations (2010) are strict liability offences; the remaining offences, under the Wildlife and Countryside Act (1981), are offences only where they are carried out "intentionally or recklessly".

Defences which were previously available under the Conservation (Natural Habitats, &c.) Regulations 1994, legislation which is superseded by the Conservation of Habitats and Species Regulations (2010), specifically the 'incidental result of a lawful operation' defence no longer apply, however the 'incidental result' defence persists within the Wildlife and Countryside Act disturbing great crested newts or obstructing access to a breeding pond, hibernacula or refugia and activities that cause low level disturbance may be able to rely on this defence.

Under the Countryside and Rights of Way Act 2000 (CROW Act) the offence in section 9(4) of the 1981 Act of disturbing great crested newts is extended to cover reckless damage or disturbance.

The Hedgerow Regulations 1997 provide for the conservation of important hedgerows and their constituent trees. The presence of a protected species such as great crested newts is a relevant consideration when assessing whether a hedgerow is important and may influence a local planning authority's decision on whether to approve removal of such hedges.

As of October 1 2006, public authorities have a duty to conserve biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006.

Common Toad

The common toad, *Bufo bufo*, has been designated a UK Biodiversity Action Plan (UK BAP) species as of 2009. This designation highlights the rarity or population decline of this species at a national level and provides a conservation methodology to mitigate this.

C SURVEY AREA AND METHODOLOGY

C.1 Survey Area

Figure 3 illustrates the habitats present within 500m of the site.



Figure 3 – Site with a 500m radius shown illustrating the habitats within the local area.
(Reproduced under licence from Google Earth Pro.)

C.2 Methodology

C.2.1 Desktop Study

Initially, the site was assessed from aerial photographs and 1:25000 OS plans. Following this, consultation was undertaken with the Local Records Centre.

C.2.2 Field Survey

C.2.2.1 *Survey Equipment*

The following items of equipment were utilised during survey work and analysis:

- Clulite CB2 (1 million candle power)
- Between 10 and 100 bottle traps per pond.

C.2.2.2 Phase 1 Habitats

The field survey of the proposed site was conducted using the methodology of the Joint Nature Conservation Committee's Phase 1 Habitat Survey, as outlined in their habitat-mapping manual¹. Each parcel of land was assessed by a trained surveyor and classified as one of approximately ninety habitat types. These were then mapped and the habitat information supplemented by dominant and indicator species codes and target notes where appropriate.

The initial habitat survey was undertaken on the 5th March 2013.

C.2.2.3 Habitat Suitability Index (HSI)

A habitat suitability Index assessment of all of the ponds on site and within the surrounding area was undertaken using the methodology produced by Oldham *et al* (2000). The detailed methodology of this assessment technique is provided in Appendix 1.

C.2.2.4 Aquatic Survey

The survey area includes all ponds within 500m of the site and included ponds 1-8. The extent of the survey area was determined by the Natural England Mitigation Guidelines which states that all ponds within 500m of a development require assessment.

Access to pond 8 within this area could not be obtained/ was not considered necessary due to:

- Different landownership and access was not available; however the pond is to the north east of the site boundary adjacent to the existing access track and therefore impacts on amphibians, should they use this pond, are considered to be limited.

The survey was conducted using the standard methodology as published in the Herpetofauna Workers Manual (1998) and following national guidelines including those issued by Natural England in their Great Crested Newt Mitigation Guidelines (English Nature, August 2001) and Froglife's Advice Sheet 11: Surveying for (Great Crested) Newt Conservation (Froglife, 2001). All work was undertaken by surveyors with Natural England licences.

Survey comprised three survey techniques which are described below. The extent of survey work was determined by the Natural England guidance on minimum survey effort provided within their Method Statement Document which is provided below:

Impact type and location	Potential terrestrial habitat - loss or damage (ha)	Presence/ likely absence survey (4 survey visits)	Population size class assessment (6 survey visits)	HSI
Permanent habitat loss or damage				
Pond(s) lost or damaged, with or without other habitat loss or damage	≥0	Yes	Yes	Yes
No ponds lost or damaged, development within 50m of nearest pond	≤0.01	Yes	No	Yes
	>0.01	Yes	Yes	Yes
No ponds lost or damaged,	≤0.2	Yes	No	No

1 Handbook for Phase 1 habitat survey, A Technique For Environmental Audit, English Field Unit, Nature Conservancy Council, 1990

development 50-100m from nearest pond	>0.2	Yes	Yes	Yes
No ponds lost or damaged, development 100-250m from nearest pond	≤0.5	Yes	No	No
	>0.5	Yes	Yes	Yes
No ponds lost or damaged, development >250m from nearest pond	≤5	Yes	No	No
	>5	Yes	No	Yes
Temporary habitat loss or damage				
Pond(s) lost or damaged, with or without other habitat loss or damage	≥0	Yes	Yes	Yes
No ponds lost or damaged, development within 50m of nearest pond	≤0.05	Yes	No	Yes
	>0.05	Yes	Yes	Yes
No ponds lost or damaged, development 50-100m from nearest pond	≤0.5	Yes	No	No
	>0.5	Yes	Yes	Yes
No ponds lost or damaged, development >100m from nearest pond	≤5	Yes	No	No
	>5	Yes	No	Yes

For this site, as the site is 0.25ha in size, with a new 500m long track created to access the site (approximately 5m in width), generally more than 250m from the breeding ponds and the impacts are considered to be permanent, 4 survey visits were undertaken on the following dates:

Visit number	Date	Methods used
1	24 th and 25 th April 2013	Egg searching, torching and bottle trapping
2	4 th and 5 th May 2013	Egg searching, torching and bottle trapping
3	18 th and 19 th May 2013	Egg searching, torching and bottle trapping
4	24 th and 25 th May 2013	Egg searching, torching and bottle trapping

This level of survey effort meets the Natural England requirements for survey effort.

During each visit the weather, including air temperature, wind, precipitation and cloud cover was recorded. If the air temperatures dropped below 5°C then consideration was given to the time of year and water temperature to determine whether it was considered that newts would remain active. If not, the survey was aborted and undertaken on a separate visit. The vegetation cover across the pond and the turbidity of the water were also recorded on a scale of 0-, 0 indicating no vegetation obscuring survey/clear water and 5 indicating that the water was completely obscured by vegetation or very turbid.

Egg searching

Egg searching was undertaken around the periphery of the pond (s). Submerged vegetation and other such material, including rubbish and dead leaves were examined to determine whether eggs were present. Great crested newts, lay eggs singly and fold pliable material, usually the leaves of aquatic plants, around them often in large numbers. The surveyor searched for folded leaves, and then gently opened them to check for eggs. Great crested newts prefer to deposit their eggs on relatively larger-leaved plants than do the smaller newts, which make their egg locations particularly conspicuous. Plants favoured by great crested newts include water forget-me-not (*Myosotis scorpioides*), water mint (*Mentha aquatica*), willowherb (*Epilobium* spp.) and flote grasses (*Glyceria* spp.) and therefore stands of these plants were searched in particular detail, however all areas of the pond were searched.

Night Torching

Torchlight searching was undertaken from approximately 1 hour after dusk depending on light levels. A high powered torch of one million candle power was used to actively search for adult great crested newts that moved from the deeper parts of the pond to the shallows during the evening to allow them to mate and lay eggs. The surveyors walked once slowly around each pond, looking for newts of all species in the torch beam, paying particular attention to marginal vegetation and potential display areas on the pond bottom. Where newts were recorded, their sex, species, age class

Bottle trapping

Both adult and larval newts can be trapped in ponds by the use of bottle traps. These can be made from empty plastic two-litre drink bottles with the ends removed, inverted and replaced to create a funnel. They are then held in place around the banks of the pond by canes with a spacing of 2m between traps. Newts find their way into the bottles but usually cannot leave. Bottle traps are an effective way of detecting a population. Bottle trapping requires two visits to a pond for each trapping session; an evening visit to set the traps, followed by an early morning visit to check them. The use of bottle traps demands considerable care and should be carried out only by thoroughly trained surveyors. If traps are fully submerged and prevent newts rising to the surface of the water to breathe, then they may eventually suffocate. Warmer water holds less oxygen, so this risk increases in hot weather and also in small, well-weeded ponds.

The traps were deployed less than an hour before dusk, left overnight and then checked between 06.00 and 11.00 hours. Traps were placed around the pond margins, facing towards the centre. Each trap was firmly fixed at the water surface, so that captured animals can take air from within the bottle. Because of the potential danger to wildlife posed by lost bottle traps it is vital to ensure that all traps set were counted in and out to ensure none were left.

Since newt activity decreases at low water temperatures bottle trapping below 5°C cannot be relied upon to detect newts.

D RESULTS

D.1 Desktop Study

D.1.1 Pre-existing Information

OS map & aerial photographs

Figures 1 (A1) and 3 (C1) show that the general land use in the surrounding area is arable with urban development, restored grassland and commercial development also present.



D.1.2 Consultation

The records from the local records centre suggest that within the local area, great crested newts are occasional in their distribution in that they are known or likely to occur at c. 1-5 ponds per square km.



D.2 Field Survey

D.2.1 Terrestrial Habitats

The phase 1 map, Figure 4 below, illustrates the habitats present on site.

The figure below illustrates the development area, the approximate location of the turbine and the current access track.



Semi Improved Grassland

The site and surrounding area comprise a wide expanse of coarse semi improved grassland. The sward was in general short, likely due to the time of year. Species present include Cock's foot (*Dactylis glomerata*), Yorkshire Fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*), meadow grass *Poa* sp. fescues *Festuca* sp., bent *Agrostis* sp, white clover (*Trifolium repens*), sow thistle sp. (*Sonchus* sp.), ribwort plantain (*Plantago lanceolata*), creeping thistle (*Cirsium arvense*), broadleaf dock (*Rumex obtusifolius*), curled dock (*Rumex crispus*) creeping buttercup (*Ranunculus repens*), broad leaved willowherb (*Epilobium hirsutum*), vetch sp. (*Vicia* sp.), ragwort (*Senecio jacobaea*), dandelion agg. (*Taraxacum* agg.), birds foot trefoil (*Lotus corniculatus*), soft rush (*Juncus effusus*) and common knapweed (*Centaurea nigra*).

Hedgerow

There are two areas of hedgerow present to the west of the site. The sections are mature and largely intact, dominated by hawthorn (*Crataegus monogyna*) and occasional elder (*Sambucus nigra*) and blackthorn (*Prunus spinosa*).

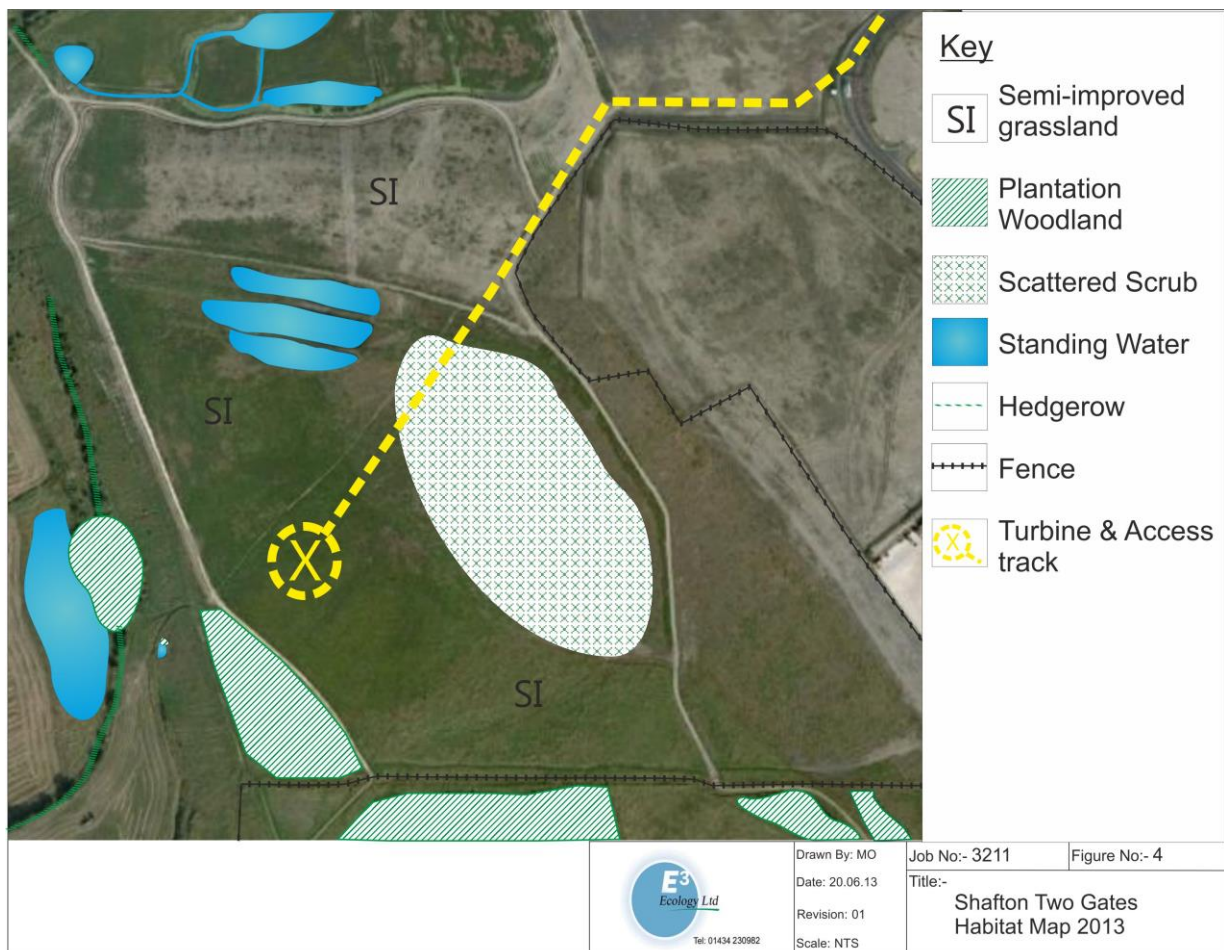
Plantation

There are a number of immature broadleaf plantations within the wider site. The trees are approximately 3m in height and well sealed, having a negligible risk for roosting bats. The following tree species were recorded: cherry (*Prunus* sp.), pedunculate oak (*Quercus robur*), silver birch (*Betula pendula*), alder (*Alnus glutinosa*), holly (*Ilex aquifolium*) and blackthorn (*Prunus spinosa*).



Scattered Scrub

Areas of immature scattered scrub are present within the grassland. Species present include willow (*Salix* sp), silver birch (*Betula pendula*), broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*).



D.2.2 Aquatic Habitats

Pond Ref.	Distance from site boundary	Pond type	Pond size	Surrounding habitats
1	340	Man made pond	925	The habitats surrounding the ponds are dominated by grassland and plantation woodland in the main. To the west of pond 5 and 6 are arable fields and to the north and east of pond 8, the habitat is dominated by commercial development.
2	40	Man made scrape	2500	
3	20	Man made scrape	2700	
4	30	Man made scrape	1650	
5	150	Man made ponds designed for GCN	140	
6	150	Man made ponds designed for GCN	2500	
7	30	Large man made pond	9400	
8	240	Large man made pond	1250	

D.2.3 Habitat Suitability Index

Pond Reference	Location		Pond Area (m ²)		Pond Permanence (years in 10 that it dries out)		Water Quality		Shade (%)		Fowl	Fish		Pond Density		Terrestrial Habitats			Macrophytes (%)		Overall Score	
	Field value	H.S.I.	Field value	H.S.I.	Field value	H.S.I.	Field value	H.S.I.	Field value	H.S.I.		Field value	H.S.I.	Field value	H.S.I.	Field value - area	Field value - barriers	H.S.I.	Field value	H.S.I.		
Pond 1	A	1	925	0.97	1	1	Poor	0.33	0	1	0	1	Minor	0.33	7	1	10	1	1	60	0.9	0.78995
Pond 2	A	1	2500	0.72	2	0.9	Moderate	0.67	0	1	2	1	Possible	0.67	7	1	10	1	1	30	0.6	0.84018
Pond 3	A	1	2700	0.69	2	0.9	Moderate	0.67	0	1	2	1	Possible	0.67	7	1	10	1	1	30	0.6	0.83654
Pond 4	A	1	1650	0.85	2	0.9	Moderate	0.67	0	1	2	1	Possible	0.67	7	1	10	1	1	30	0.6	0.85426
Pond 5	A	1	140	0.28	2	0.9	Good	1	0	1	0	1	Absent	1	7	1	10	1	1	60	0.9	0.86211
Pond 6	A	1	2500	0.72	2	0.9	Good	1	50	1	0	1	Absent	1	7	1	10	1	1	40	0.7	0.92438
Pond 7	A	1	9400	0.8	0	0.9	Moderate	0.67	0	1	5	0.63	Minor	0.33	7	1	10	1	1	20	0.5	0.74076

As pond 8 could not be accessed, a full HSI assessment could not be completed, however it is considered that this pond has the potential to be of at least average suitability for the species based on its location, size and surrounding habitats.

D.2.4 Aquatic Survey Results

Survey of pond 1		Great Crested Newt				Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female						
24 th 25 th April 2013	Torch		0	0	0	0	0	1	0	0	13	2	60	162	0	2 mallard
	Bottle trap	33	0	0	0		5	1	0	0						
4 th and 5 th May 2013	Torch		0	0	0	0	0	0	0	0	7.8	3	60	0	L	0
	Bottle trap	25	0	0	0		0	0	0	0						
18 th and 19 th May 2013	Torch		0	0	0	0	0	0	0	0	12.1	3	60	0	L	St
	Bottle trap	25	0	0	0		0	0	0	0						
24 th and 25 th May 2013	Torch		0	0	0	0	0	0	0	0	10.5	3	60	L	L	0
	Bottle trap	25	0	0	0		0	0	0	0						

Survey of pond 2		Great Crested Newt				Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female						
24 th 25 th April 2013	Torch		0	0	0	0	0	0	0	0	13	3	30	14	0	0
	Bottle trap	37	0	0	0		1	1	0	0						
4 th and 5 th May 2013	Torch		0	0	0	0	1	0	0	0	7.8	3	40	0	L	0
	Bottle trap	25	0	0	0		0	0	0	0						
18 th and 19 th May 2013	Torch		0	0	0	0	1	1	0	0	12.1	3	40	0	L	0
	Bottle trap	25	0	0	0		5	1	0	0						
24 th and 25 th May 2013	Torch		0	0	0	0	3	0	0	0	10.5	3	40	L	0	0
	Bottle trap	25	0	0	0		0	0	0	0						

Survey of pond 3		Great Crested Newt				Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species	
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male								Female
24 th 25 th April 2013	Torch		0	0	0	0	0	1	0	0	0	13	3	30	10	0	Moorhen
	Bottle trap	50	0	0	0		1	1	0	0							
4 th and 5 th May 2013	Torch		0	0	0	0	2	0	0	0	0	7.8	3	40	0	L	0
	Bottle trap	30	0	0	0		1	2	0	0							
18 th and 19 th May 2013	Torch		0	0	0	0	0	1	0	0	0	12.1	3	40	L	L	0
	Bottle trap	30	0	0	0		1	3	0	0							
24 th and 25 th May 2013	Torch		0	0	0	0	1	0	0	0	0	10.5	3	40	L	L	0
	Bottle trap	30	0	0	0		0	1	0	0							

Survey of pond 4		Great Crested Newt					Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female							
24 th 25 th April 2013	Torch		0	0	0	0	0	0	0	0	0	13	3	30	5	0	0
	Bottle trap	27	0	0	0		0	0	0	0							
4 th and 5 th May 2013	Torch		0	0	0	0	0	2	0	0	0	7.8	3	40	L	L	0
	Bottle trap	30	0	0	0		2	0	0	0							
18 th and 19 th May 2013	Torch		0	0	0	0	1	0	0	0	0	12.1	3	40	L	L	0
	Bottle trap	12	0	0	0		0	2	0	0							
24 th and 25 th May 2013	Torch		0	0	0	0	1	0	0	0	0	10.5	3	40	L	L	0
	Bottle trap	30	0	0	0		3	1	0	0							

Survey of pond 5		Great Crested Newt					Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female							
24 th 25 th April 2013	Torch		0	0	0	0	0	1	0	0	0	13	2	90	1	0	0
	Bottle trap	0	0	0	0		0	0	0	0	0						
4 th and 5 th May 2013	Torch		0	0	0	0	2	1	0	0	0	7.8	1	90	L	L	0
	Bottle trap	12	0	0	0		4	2	0	0	0						
18 th and 19 th May 2013	Torch		0	1	0	0	0	0	0	0	0	12.1	0	90	L	L	0
	Bottle trap	12	0	0	0		0	0	0	0	0						
24 th and 25 th May 2013	Torch		0	0	0	0	0	0	0	0	0	10.5	1	90	L	0	0
	Bottle trap	12	0	0	0		1	0	0	0	0						

Survey of pond 6		Great Crested Newt					Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female							
24 th 25 th April 2013	Torch		0	0	0	0	0	0	0	0	0	13	2	100	1	0	0
	Bottle trap	0	0	0	0		0	0	0	0	0						
4 th and 5 th May 2013	Torch		2	0	0	0	0	4	0	0	0	7.8	2	100	L	0	0
	Bottle trap	10	0	0	0		0	0	0	0	0						
18 th and 19 th May 2013	Torch		7	3	0	0	1	1	0	0	0	12.1	1	100	L	L	St
	Bottle trap	10	0	0	0		0	0	0	0	0						
24 th and 25 th May 2013	Torch		4	1	0	0	0	3	0	0	0	10.5	2	100	L	L	St
	Bottle trap	10	0	0	0		0	0	0	0	0						

Survey of pond 7		Great Crested Newt				Smooth		Palmate		Newt – unsure of spp.	Air Temperature (°C)	Turbidity (0-5)	Vegetation (%)	Toad (E = Eggs L= larvae)	Frog (E = Eggs L= larvae)	Other species
Date of survey	Survey method	No. of traps	Male	Female	Immature	Eggs/ larvae	Male	Female	Male	Female						
24 th 25 th April 2013	Torch		0	0	0	0	0	0	0	0	13	3	10	103	0	Large number of waterfowl
	Bottle trap	0	0	0	0		0	0	0	0						
4 th and 5 th May 2013	Torch		0	0	0	0	0	0	0	0	7.8	3	10	1+L	L	Waterfowl and St
	Bottle trap	0	0	0	0		0	0	0	0						
18 th and 19 th May 2013	Torch		0	0	0	0	2	0	0	0	12.1	3	10	45+L	L	Waterfowl and St
	Bottle trap	0	0	0	0		0	0	0	0						
24 th and 25 th May 2013	Torch		0	0	0	0	6	4	0	0	10.5	3	10	25+L	L	St
	Bottle trap	0	0	0	0		0	0	0	0						

E ASSESSMENT

The value and significance of the habitats and species found was assessed against the following criteria developed from the Guidelines for Ecological Impact Assessment produced by the Institute of Ecology and Environmental Management².

Level of Value	Examples
International	• An internationally designated site or candidate site. • A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. • Any regularly occurring, nationally significant population/number of any internationally important species.
National	• A nationally designated site. • A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • Any regularly occurring population of a nationally important species, which is threatened or rare in the region or county. • A regularly occurring regionally or county significant population/number of any nationally important species. • A feature identified as of critical importance in the UK BAP.
Regional	• Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. • A regularly occurring, locally significant number of a regionally important species.
County	• County designated sites. • A viable area of a habitat type identified in the County BAP. • Any regularly occurring, locally significant population of a species which is listed in a County "red data book" or BAP on account of its regional rarity or localisation. • A regularly occurring, locally significant number of a species important in a County context.
District	• Areas of habitat identified in a District level BAP. • Sites designated at a District level. • Sites/features that are scarce within the District or which appreciably enrich the District habitat resource. • A population of a species that is listed in a District BAP because of its rarity in the locality.
Parish	• Area of habitat considered to appreciably enrich the habitat resource within the context of the Parish. • Local Nature Reserves.
Local	• Habitats and species that contribute to local biodiversity, could only be replicated in the medium term, but are common in the local area. • Loss of such habitats would ideally be mitigated if local biodiversity is to be conserved and enhanced.
Low	• Habitats of poor to moderate diversity such as established conifer plantations, species poor hedgerows and unintensively managed grassland that may support a range of Local BAP species but which are unexceptional, common to the local area and whose loss can generally be readily mitigated.

² Institute for Ecology and Environmental Management (2006) Guidelines for Ecological Impact Assessment in the United Kingdom (Version 7 July 2006). <http://www.ieem.org.uk/ecia/index.html>.

E.1 Summary of presence/absence survey and habitat quality

Pond ref	GCN Peak adult count	HSI	Constraints
1	0	0.78995	None- presence absence survey only
2	0	0.84018	
3	0	0.83654	
4	0	0.85426	
5	1	0.86211	
6	10	0.92438	
7	0	0.74076	
8	No access available		

E.2 Site Status Assessment

E.2.1 Quantitative

Overall a good or moderate population has been recorded within the survey area in ponds 5 and 6. This is considered to be of moderate importance in a local context. These ponds are not on site and approximately 150m from the development boundary.

E.2.2 Qualitative

The quality of the site is considered to be low, being small in area and supporting low quality, non-breeding habitats which are locally common.

E.2.3 Functional

The site comprises habitats that are not considered to result in a functional impact to the local population and therefore it is considered to be of low functional value to the local population.

E.2.4 Contextual

The contextual value of the site is considered to be low, being a small area of land which supports similar habitats to those within the immediate area. The local population within ponds 5 and 6 are unlikely to utilise the land within the development zone on a regular basis, although small numbers of juvenile newts may move over the site.

E.2.5 Conclusion

Overall the site is considered to be of low value to the local population of great crested newts being small in area and supporting similar habitats to those present within the wider area. There are no breeding sites within the development area.

E.3 Limitations

There are not considered to have been any significant constraints to survey. Pond 8 could not be accessed, however this is more than 200m from the development boundary, and the area of land within the development zone would not be sufficiently significant to have an impact on any population of great crested newts within this pond, being less than 0.02ha in size.

F IMPACT ASSESSMENT

The development is considered to have, overall, a minor effect on the local population of great crested newts, based on the results of the survey work undertaken on site and within the surrounding area, the habitats on site, the size of the site and the nature of the development. The impacts of the various elements of the development are discussed below.

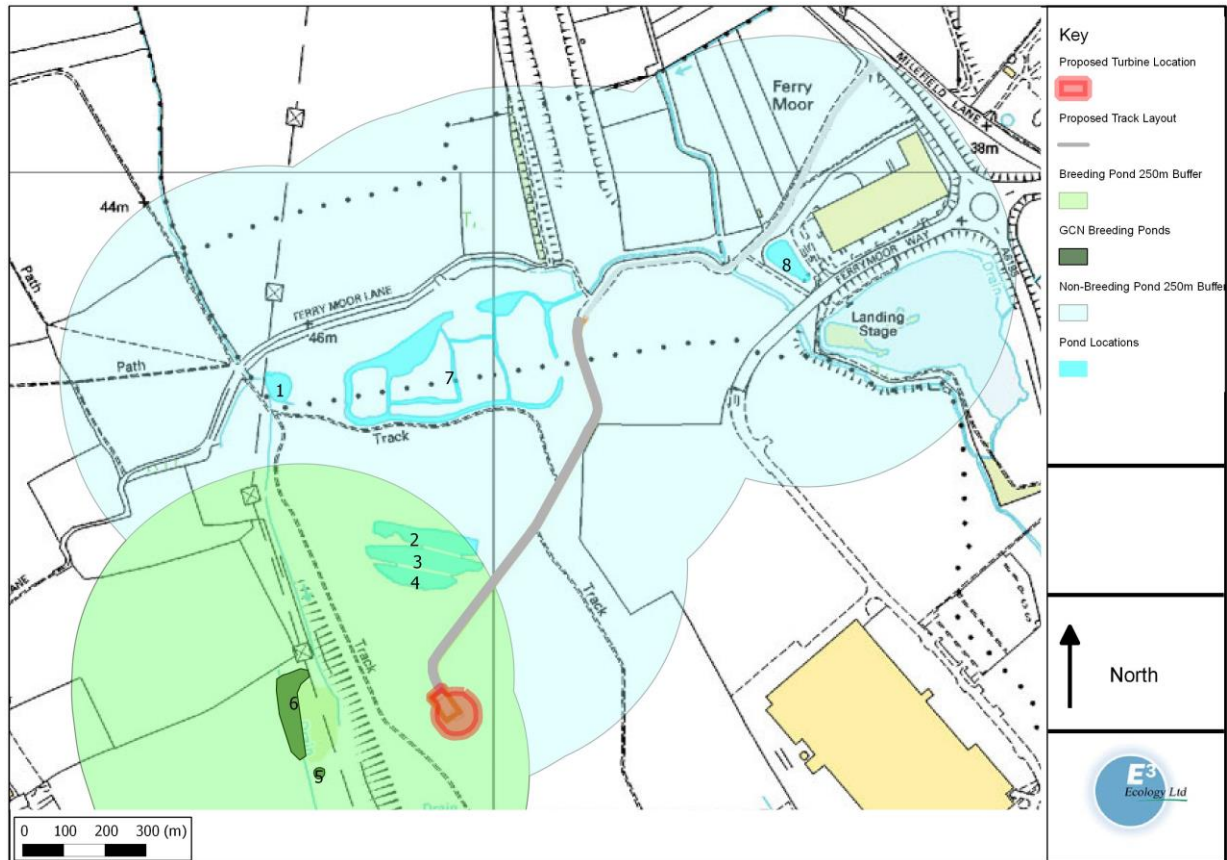


Figure 5 – Impacts of the development with a 250m buffer shown around pond 5 and 6

F.1 Pre- and mid-development impacts

The development will result in small areas of grassland being lost and any newts within these areas being disturbed and potentially harmed as a result of the proposals. Ground works associated with the construction of the track and turbine may also cause harm and disturbance to these animals. This is considered to have only a low impact on the local population given the very small size of the development footprint.

F.2 Long-term impacts

The long term impacts of the works are limited to the loss of small areas of grassland to the proposals, and this is considered to have only a low impact on the local population.

F.3 Post-development interference impacts

There will be an increase in vehicular movement onto the site, however these vehicles will be limited to the track and therefore are unlikely to cause harm to the species. In addition such access will only be infrequent.

F.4 Other impacts

No other impacts are envisaged.

F.5 Conclusions

Overall, based on the survey results and proposed layout of the development, the proposals are not considered to have a significant impact on the local population. This is based on the Natural England licence risk assessment tool. The tool assessed the likely impact on great crested newts based on the distance of the site from nearby ponds and the size of the site. For this site, there is no habitat to be lost from within 100m, less than 0.5ha within 250m and less than 1ha between 250m and 500m. The risk assessment tool therefore suggests that the development will not result in impacts of significance to the species at the local population level and therefore would not require a licence.

G MITIGATION AND RECOMMENDATIONS

G.1 Further Survey

No further survey work is considered appropriate.

G.2 Habitat Creation and Enhancement

G.2.1 Aquatic Habitat Creation

It is recommended that a swale be created along the length of the proposed access track with sections dammed to create areas that are wet for reasonably long periods of time during wet years, but which dry out to minimise the risk of sticklebacks colonising them. Such swales will benefit local amphibian populations as well as invertebrates. The swale will have a variable depth, ranging from 0.5 to 1m in places and as previously stated, will be dammed in sections, such that it does not act as a drainage feature unless full.

G.2.2 Terrestrial Habitat Creation

Hibernacula will be provided on site using the spoil from the excavations. Such features will be created to the south of the turbine location, towards the location of the existing population.

G.3 Post development monitoring

No monitoring works are proposed.

H APPENDICES

H.1 Appendix 1: Habitat Suitability Index (HSI) Methodology

The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham *et al.* (2000) as a means of evaluating habitat quality and quantity for the species. It was developed to provide a numerical index of between 0 and 1 to aid in assessing habitats in a more objective manner. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability categories, all of which are factors thought to affect great crested newts and are described in the text below in more depth.

The HSI for great crested newts is a measure of habitat suitability and it is not a substitute for newt surveys undertaken at the correct time of year as the system is not sufficiently precise to allow conclude that a pond does or does not support newts. Ponds with greater HSI scores are likely to support greater populations of the species, however again an assessment of a population cannot be made by an HSI score alone.

According to Natural England guidance, HSI scores can be useful when employed for the following tasks:

- 1) in **surveys**, to assess habitat quality in a repeatable, objective manner.
- 2) in **impact assessments**, to allow a measure of how damaging a development could be.
- 3) in **risk assessments**, helping to decide whether an offence might be committed, and therefore whether a license should be applied for.
- 4) in **habitat enhancement**, HSI could be used to identify the low-scoring factors in an existing pond that need addressing to improve its quality for newts.
- 5) in **post-development monitoring**, to allow an assessment of habitat condition.

The factors used in the calculation are explained below:

- **Geographic location (SI₁):** Based upon national newt distribution.
- **Pond Area (SI₂):** The optimum size of ponds for great crested newt occupancy is in between 500 and 750m², calculated from the National Amphibian Survey (Sweet & Oldham, 1993). Ponds of a larger size become less suitable as are smaller ponds, which are unlikely to support viable breeding populations.
- **Pond permanence (SI₃):** Pond permanence is essential to permit the completion of metamorphosis in any given year and if a pond successively dries out before metamorphosis is complete this could lead to extinction of a population. However, occasional drying out can be of benefit, by preventing colonisation by fish which may predate upon newt eggs. The optimal frequency of drying out is assumed to be one year per decade.
- **Water quality (SI₄):** The presence of indicator organisms is used to assess water suitability. Normally clear water with an abundant and diverse invertebrate community including relatively sensitive groups such as mayfly larvae, water shrimps and amphibians is considered the optimum state.
- **Pond shading (SI₅):** Shade can reduce the growth of beneficial macrophytes and excessive tree cover may increase the organic content through leaf fall and cause eutrophication. The National Amphibian Survey found that newt occurrence was significantly reduced above a threshold of 75% shade.
- **No. of waterfowl (SI₆):** Common waterfowl, such as moorhens and mallards, in naturally occurring numbers have little adverse effect upon newt populations but when encouraged by supplementary feeding, they can seriously damage the habitat, partly by direct mechanical interference, but also by excessive nutrient enrichment.

- **Occurrence of fish (SI₇):** Fish can have a negative impact on great crested newt presence, particularly stickleback, which can be both predatory and competitive. Other species such as goldfish and carp appear in some conditions to be benign.
- **Pond density (SI₈):** Great crested newts are known to occur in metapopulations and population persistence depends, in part, upon the distance separating breeding sites. The optimum density of ponds for great crested newts is 4 per km².
- **Proportion of “newt friendly habitat” (SI₉):** In the terrestrial stage of their life-cycle newts are known to occur more frequently on land with low intensity use, than on pasture and arable. Scrub, unimproved grassland, woodland (both deciduous and coniferous) and gardens are regarded as providing newt-friendly habitat, unlike improved pasture, arable and urban land. The greater the area of good habitat, the greater the confidence that the site is suitable. Habitat features such as hedges and ditches also enhance the suitability of the site. The presence of barriers to terrestrial dispersal of newts modifies the importance of newt-friendly habitat within range of the breeding site. Roads and rivers are perhaps the two most serious amongst the many man-made and natural barriers interfering with newt migration.
- **Macrophyte Content (SI₁₀):** Although not a direct food source for great crested newts, macrophytes fulfil a number of roles. They provide a food source (direct or indirect) for prey organisms, cover from predators and a substrate for egg attachment. The National Amphibian Survey data showed the highest occurrence of great crested newts in ponds with emergent vegetation cover between 25 and 50% and submerged vegetation between 50 and 75%.

Calculation of the Habitat Suitability Index

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

HSI = Habitat Suitability Index; SI = Suitability indices (expressed as values between 0 and 1) in respect of each of the key habitat features.

The result of the above HSI calculation is a single number between 0 and 1. In evaluations of the Habitat Suitability Index the lowest HSI obtained at a site known to support breeding great crested newt was 0.43, the highest 0.96.

This is based on Lee Brady’s categorisation of the scores.

If a pond has a very low HSI score (<0.5) then there would be a minimal chance of great crested newt presence. Therefore in some limited circumstances, the HSI might be used to help conclude that an offence is highly unlikely and therefore development could proceed in an area without a license. The use of the system in this way could only be used when other factors such as distance from the pond, proposed area of habitat loss and quality of habitats to be lost further minimise the risk of newts being impacted by the development. There would still be a risk of committing an offence, but it would typically be so low as to be negligible.