

APPENDIX 8.5:
Hemsby
Wind Farm Proposal
Herpetofaunal Appendix

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Aim

The aim of this survey was to provide information concerning the status of amphibian and reptile species at the proposed wind farm site, Hemsby, centred on Grid Ref: TG 489 164 This information would then be used to inform assessment of potential impacts of the development on the amphibian and reptiles species, and to recommend mitigation measures if required.

Survey Area

The survey area for Great Crested Newts is shown on **Figure 1**. The study area for the pond assessments includes all known ponds located on land within 500m of the perimeter of the turbine locations as of the 25th April 2007. **Figure 1** shows the survey area and refugia used for reptiles.

Status of Great Crested Newt in the Study Area

Great crested newts are widespread throughout East Anglia with good populations known in North East Norfolk e.g. Mannington Hall. They have not previously been recorded on the proposed development site, based on consultation with the Norfolk Biological Records Centre. They are however on the species list of Hall Farm Fen, along with Common Toad (*Bufo bufo*), Common Frog (*Rana temporaria*) and Smooth newt (*Triturus vulgaris*) Records from the National Biodiversity Network Gateway website show that the only record for the area is from 1975. This record only shows that great crested newts have been recorded in the 10 Km grid square.

Status of Reptiles in the Study Area

No reptiles have previously been recorded on the proposed development site, based on consultation with the Norfolk Biological Records Centre. Grass snake (*Natrix natrix*) and Common lizard (*Zootoca vivipara*) are recorded on the species list of Hall Farm Fen. The Records from the National Biodiversity Network Gateway do show that Adders (*Vipera berus*) are in the dunes at Winterton approximately 2.6Km, grass snake has been recorded within the 10Km Grid square with more precise records for Runham (6.9Km) and Acle (10Km) and Common lizard 3.4Km from the nearest turbine. The National Biodiversity Network Gateway's records are 20 years old or more.

Great Crested Newt Survey Method

The survey was conducted from 25th April 2007 to 5th May 2007. The surveys were carried out by John Harris (licence No 20071003) and Robert Yaxley (licence No 20070356)

The survey programme was conducted in a staged approach. Initial assessments of water-bodies, within the defined study area (**Figure 1**), were carried out. To identify suitable ponds which required further, more detailed survey. Detailed surveys were then carried out to determine the presence/absence of great crested newts. If Great Crested Newts were present, additional surveys were carried out to determine their population sizes.

Initial Waterbody Assessments

Waterbody assessments (WBA) were carried out, by Great Crested Newt licence holders, in June 2006, as part of the Extended Phase 1 Habitat Survey. The survey encompassed all ponds within 500m of the proposed turbine locations. Access for the ecological surveys was previously agreed with all landowners. Provision was included to contact each landowner to inform them of the date of individual visits.

The ponds were located from Ordnance Survey data and aerial photographs. This exercise showed that there appeared to be one pond and a suitable ditch within the survey area. A walkover was carried out to identify any additional ponds close to the proposed development, not shown on the Ordnance Survey map. No further water bodies were found within 500m. These ponds have been highlighted on **Figure 1**.

The purpose of the waterbody assessment was to clarify the need for further presence/absence surveys. In addition, ponds where no survey was considered necessary were identified. For example, those located close to the 500m buffer limits, with suboptimal characteristics, no linking terrestrial habitat or a combination of these factors.

Presence/Absence Surveys

Following the WBA, ponds requiring further survey work, to establish whether great crested newts were present or absent, were identified.

A survey schedule was determined and the landowners/tenants were contacted by telephone and informed of the dates on which the survey would take place.

The survey technique used for the presence/ absence for all suitable ponds complied with "Great Crested Newt Mitigation Guidelines" (English Nature, 2001).

In summary, the Guidelines recommend that in order to determine presence/absence of Great Crested Newts, that four survey visits are carried out between mid-March and mid-June, with two of the visits between mid-April to mid-May. Each survey visit should consist of three of four of the following recommended techniques; torching; bottle trapping; egg searching; or netting.

The habitat and characteristics of each pond were assessed to identify the preferred survey technique. The survey technique selected for each suitable pond can be

seen in **Table 1**. The selection of methods was dictated by physical features of the pond, accessibility and vegetative cover of pond, or restrictions due to other wildlife found in pond such as water shrews (*Neomys fodiens*).

The methodology of each of the four techniques carried out is given below and is extracted from the Guidelines (English Nature, 2001).

Torching – This method involves searching for great crested newts at night by shining a torch in the pond. In clear ponds this can be a simple and very effective way of detecting newts, but in heavily weeded or turbid ponds this method is limited. Bright light may cause great crested newts to seek the cover of vegetation, possibly affecting survey results and disrupting their breeding activity. Nonetheless, it is often indicated as a useful method. Powerful torches should be used, with 50,000 candlepower as a recommended minimum. Some surveyors use 1,000,000 candlepower torches, which may increase the chance of detecting newts and may reveal a higher proportion of the newts present, though increased disturbance also occurs. The margins of the pond are often the best areas to search for newts. It is recommended that the entire margin of the pond be walked once, slowly checking for great crested newts (though some areas of the margin may need to be omitted if access is difficult). Torch survey results are subject to high variation due to weather conditions, and so should only be carried out under the following conditions: night-time air temperature $>5^{\circ}\text{C}$, no/little wind, no rain

Bottle Trapping – This method involves setting bottle traps (normally made from 2-litre plastic bottles) around the pond margin, and leaving the traps set overnight. A density of one trap per two metres of shoreline is recommended for general survey purposes. Some studies indicate that bottle trapping is the most reliable method for detecting the presence of great crested newts, and it is especially useful for surveying turbid or weedy ponds. The main disadvantages are susceptibility to damage by vandals and possible harm to newts; certainly there is a need for careful training to minimise such risks. Bottle trapping can be used to catch adults during the breeding season and larvae during summer. It should only be used when the night-time air temperature is $>5^{\circ}\text{C}$, but note that very high temperatures can increase the likelihood of harm to trapped newts, especially larvae. This method must be carried out strictly in accordance with guidelines on animal welfare

Egg Searching – This method involves searching both live and dead submerged vegetation for great crested newt eggs (or rather, strictly speaking, embryos). This is often a very effective method for detecting great crested newt presence, but eggs can prove difficult to find in heavily vegetated ponds with small newt populations, or those with no accessible vegetation. The search should be conducted with care not to damage the eggs or the aquatic and marginal vegetation. Normally, it is necessary to ‘unwrap’ eggs to confirm identification, and there is some evidence that exposed eggs may be more prone to predation and UV radiation impacts. It is therefore recommended that large areas of vegetation are not systematically unwrapped (to conduct egg counts); once great crested newt eggs have been reliably identified, the search can be terminated. This is not a problem as the method does not give any meaningful quantitative information on population size. In large ponds, it may be useful to conduct egg searching in different sections of the pond margin to establish favoured breeding areas. Artificial ‘egg strips’ may be successful at detecting newt presence, and are especially valuable in sparsely vegetated ponds (though even in well-vegetated ponds, newts sometimes prefer them). Egg-strips may be constructed from plastic bin-liners cut into 1-2cm wide strips, attached to a stake or rock and

submerged near the pond margin. The risk of interference should be considered (do not use them if there is a high risk), and egg-strips should be removed after hatching. When egg searching it can be instructive to make a note of the developmental stage of newt eggs and the presence of previously used leaves (folds without eggs are often evident in late season)

Netting – Using a long-handled dip-net, great crested newts can be captured by sampling the area around the pond edge. Netting can be conducted by day or night, but better results may be obtained at night when adult newts are more likely to be in open water. A perimeter walk, as with torch surveys, is recommended, and there should be at least 15 minutes of netting per 50m of shoreline. Studies indicate that netting is much less effective at detecting adult great crested newt presence than bottle trapping, torch survey or egg search, but it is nonetheless useful in augmenting these techniques. In addition, netting is often useful for finding larvae during late summer (though care is needed to avoid damage to gills). Results from netting are normally only useful for indicating presence/absence; using netting to give an indication of population size is not usually recommended.

[Extracted from “Great Crested Newt Mitigation Guidelines” (English Nature, 2001)].

A standard survey form (a copy of which is provided at the end of this Appendix), was completed for each pond for each survey visit. The following information was recorded:

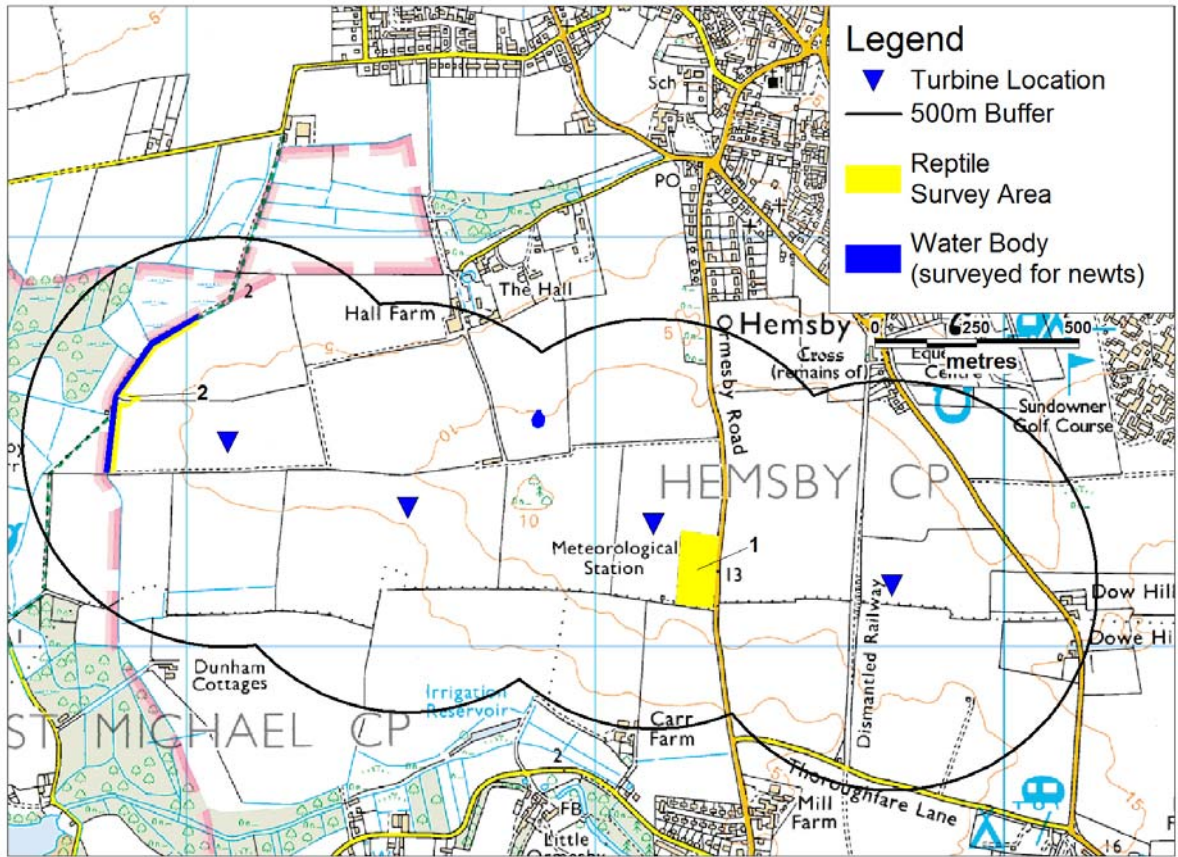
- Date, visit and pond number.
- Air temperature for Day and Night.
- Water level and pond shading changes since last visit.
- Aquatic vegetation changes
- Disturbance.
- Sex and life-stage of any great crested newt, or any other amphibians, recorded, sorted by survey technique
- Details of any fish or other species recorded and any other notes.

Table 1: Survey Techniques used for each pond during the presence/ absence survey and date of visit

Pond	Technique used				Date of Visit			
	Netting	Bottle Trapping	Egg Searching	Torching	Visit 1	Visit 2	Visit 3	Visit 4
Pond		✓	✓	✓	25/04/2007	29/05/2007	31/05/2007	05/06/2007
Ditch	✓		✓	✓	25/04/2007	29/05/2007	31/05/2007	05/06/2007



Figure 1: Map of Great Crested Newt and Reptile Survey Sites





Reptile Survey Method

The survey was conducted from 15/09/06 to 02/10/06.

The surveys were carried out by Robert Yaxley.

The survey programme was designed to take place from September to mid-October, as reptiles spend longer basking in the morning and evening as air temperature is lower. Initial areas suitable for reptiles were highlighted from an Extended Phase One habitat survey of the defined study area. Detailed surveys were then carried out to determine the presence/absence of reptiles.

The method follows the guidance given in Froglife Advice Sheet 10 – Surveying for Reptiles.

Setting up a reptile survey using refugia

The four common species of reptile use refugia made from either metal or roofing felt, although casual observations have found that Slow Worms may prefer roofing felt and that Adders may prefer metal sheets. A mixture of both metal sheets and roofing felt within a site survey is preferable. However, choice of material depends on availability, access to the site, level of human disturbance and site topography (if the sheets have to be carried a long way or if human disturbance is likely then roofing felt may be preferable as it is lighter and easier to camouflage, but if the site is very overgrown then metal may be better as this flattens the vegetation and is often easier to find). The sheets should be approximately 0.5m². The density of sheets put out does depend on the suitability of habitat present, but a minimum of 5 refugia per hectare should be used. Refugia should be placed in likely basking spots (for example, unshaded patches next to cover), in areas of long grass and next to potential hibernation sites (for example, piles of rubble or logs or disused rabbit burrows). Refugia should be kept away from public footpaths as reptiles are vulnerable when they are sheltering under them. The refugia should be numbered and their locations marked on a map to ensure they are all checked and removed at the end of the surveys.

Checking refugia

All the sheets were checked seven times these checks were in September. Each visit was carried out on a separate day. The sheets were checked ideally either between 08.30 and 11.00 or between 16.00 and 18.30. The times were varied so visits were completed in both the morning and afternoon. The sheets were not checked in heavy rain, strong wind or when the temperature was below 9°C. A record of the weather during each survey visit was made. The reptiles found on or under refugia were identified, but not caught or handled. Other potential basking spots on the site, away from the refugia, were also checked. When the surveys were completed on the final visit the refugia were all removed from the site.

The locations of the artificial refugia are shown on **Figure 1**. The area of suitable habitat was approximately 7.4 hectares, the sheets were placed strategically. Due to this approach enough sheets were used to ensure the comprehensive cover of the suitable habitat for reptiles. The exact placement of each refugia was determined by the presence of suitable habitat and whether the refugia would have been likely to be interfered with. At Hemsby a mixture of roofing felt and tins were used. There were



eight visits to the site, the first to lay out the sheets the next seven were to survey for reptiles, with the sheet being collected on the last visit.

The sheets rather than being numbered individually were grouped in to 2 arrays of 15 sheets.

Results – Great Crested Newt

Initial Pond Assessment Summary

Within the study area one pond and 400m of ditch were considered suitable for Great Crested Newt survey.

The pond was isolated in an arable field. The edge of the pond was surrounded by tall trees, hawthorn, and nettles predominantly. The pond is 370m from the nearest turbine.

The ditch was deemed suboptimal, but worth surveying, as there was a very gentle flow. To the west of the ditch the habitat was good for great crested newts for foraging and there were area of woodland which would provide good habitat for newts to hibernate.

Photographs both of the water bodies surveyed are provided at the end of this Appendix.



Great crested newt presence and population size

No Great crested newts were found during the surveys

A summary of the maximum numbers of great crested newts recorded on each visit is given in **Table 2**. The full results, including the sex, life stage, and method by which they were surveyed are included as at the end of this Appendix.

Table 2 also provides a population size class, as based on Natural England guidelines (English Nature, 2001), where:

- Small population size = maximum counts up to 10
- Medium population size = maximum counts between 11 and 100
- Large population size = maximum counts over 100

Table 2: Numbers of Great Crested Newts recorded per visit per pond, Population Size Class and presence of eggs

Pond	Number of Great Crested Newts				Eggs	Population Size Class
	Visit 1	Visit 2	Visit 3	Visit 4		
Pond	0	0	0	0	No	None
Ditch	0	0	0	0	No	None

Great Crested Newt Breeding Status

No Eggs were found during the survey.

Other species recorded

Table 3 summarises the presence of other amphibians, fish and other wildlife recorded during the surveys.

Table 3: Ponds in which other relevant wildlife were present

Pond	Species present			
	Frog/ Toad	Fish	Water Fowl	Rodents
Pond				Rats
Ditch	Frog	Yes	Heron	



Results – Reptiles

Within the study area approximately 7.4 hectares were identified as suitable habitat for reptiles. A grass snake juvenile was seen during the survey on the 28th of Sept (visit 6 see **Table 4**).

Table 4 summarises what animal were found in each array each visit.

Table 4: Summary of finding for each visit

Visit	Array	Slow Worm		Common Lizard		Grass Snake		Adder		Other
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	
1	1									
	2									
2	1									
	2									
3	1									
	2									
4	1									
	2									Water shrew
5	1									
	2									
6	1									
	2						1			
7	1									
	2									



Survey Limitations and Constraints

Weather Conditions – Great Crested Newts

The weather over the survey period was well with in the parameters set out in the guidelines.

Weather Conditions – Reptiles

The mean temperatures in England in September were above the average as were the hours of sunshine (MET Office).

Constraints – Great Crested Newt

The following constraints were noted on the survey data:

During the initial pond assessment

For the ponds surveyed there were no limitations or constraints.

During presence/ absence

These were that the banks of the pond were overgrown. Although overgrown it was still possible to set bottle traps at 2m intervals. Under the guidelines from Natural England the first two visits should take place between mid-April and mid-May, the first visit was in side this time frame but unfortunately the second was the 29th of May which is late-May. It has been considered though that this has not affected the reliability of the survey results.

Constraints - Reptiles

The following constraints were noted on the survey data:

There were no constraints to the reptile survey.

Species Marked for Impact Assessment

Grass Snake were found on the site.

The full list of species (valued ecological receptors) to be carried forward to detailed assessment is therefore:

Common frog, *Rana temporaria*

Grass snake, *Natrix natrix*



References

English Nature (2001) Great Crested Newt Mitigation Guidelines

English Nature (2003) Great Crested Newts on Your Farm

English Nature (2004) Reptiles: guidance for developers

Froglife (1999) Advise Sheet 10

IEEM (2006) Guidelines for Ecological Impact Assessment in the United Kingdom

Joint Nature Conservation Committee (2003) Herpetofauna Workers' Manual

MET Office (2009) 2008 Monthly Weather Summary. Available:
<http://www.metoffice.gov.uk/climate/uk/2006/index.html> [Accessed 05/06/07]

National Biodiversity Network (2009)
<http://www.searchnbn.net/gridSquares/10kmSquareSpeciesGroups.jsp> [Accessed
05/01/2009]

Natural England (2008) Disturbance and protected species: understanding and applying the law in England and Wales - A view from Natural England and the Countryside Council for Wales

Oldham R, Keeble J, Swan M, Jeffcote M (2000) Evaluating the suitability of Habitat for Great Crested Newt (*Triturus Cristatus*). Herpetological Journal 10: 143-155.

Wild Frontier Ecology Ltd (2008) Extended Phase One Habitat Survey



Survey Forms

Great Crested Newt Record Form

Project Name _____ **Date** _____

Pond Number _____ **Visit** _____ **Temp (°C)** _____ **Day** _____ **Night** _____ **Photograph Taken Yes / No** _____
(photo to be taken on visits 2, 4 and 6)

Changes to Pond Water Level (% cover) _____ **Pond Shading (% cover)** _____ **Vegetation in Pond (% cover)** _____ **Vegetation on Pond Surface (% Cover)** _____
(Water Level Based on original assessment)

Signs of Pollution

Anthropogenic disturbance

	Bottle Trap		Torching		Netting		Eggs			
	Adult Male	Adult Female	Adult Male	Adult Female	Adult Male	Adult Female	Juvenile	Tadpole	Yes / No	Yes / No
Great Crested Newt										
Smooth Newt										
Palmate Newt										
Common Frog										
Common Toad										
Natterjack Toad										
other										
other										

Fish Species

Other Notes



Plates of Ponds taken during pond assessment

Plate 1 – Pond 1



Plate 2 – Ditch





Raw Data of Ponds surveyed for Great Crested Newts – Visit, Survey Type, and Sex or Juvenile

Table 5: Key to Table Colours for Tables 6 to 9

Colour	Meaning
	Method not used
	Pond dried up

Table 6: Visit 1

Pond Number	Bottle			Netting			Torching			Egg
	Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	Yes / No
Pond	0	0	0				0	0	0	No
Ditch				0	0	0	0	0	0	No

Table 7: Visit 2

Pond Number	Bottle			Netting			Torching			Egg
	Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	Yes / No
Pond	0	0	0				0	0	0	No
Ditch				0	0	0	0	0	0	No

Table 8: Visit 3

Pond Number	Bottle			Netting			Torching			Egg
	Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	Yes / No
Pond	0	0	0				0	0	0	No
Ditch				0	0	0	0	0	0	No

Table 9: Visit 4

Pond Number	Bottle			Netting			Torching			Egg
	Male	Female	Juvenile	Male	Female	Juvenile	Male	Female	Juvenile	Yes / No
Pond	0	0	0				0	0	0	No
Ditch				0	0	0	0	0	0	No