Preliminary Environmental Information Report Volume 2

Appendix 8.7 Baseline Report – Herpetofauna Survey

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Contents

1 Introduction

1.1 Project description

1.1.1 LionLink is a proposed electricity interconnector between Great Britain and the Netherlands that would supply up to 2 gigawatts (GW) of electricity and would connect to Dutch offshore wind via an offshore converter platform in Dutch waters (hereafter the Project).

1.1.2 The Proposed Scheme (defined as the part of the Project within the British jurisdiction) would involve the construction of the proposed Converter Station and the installation of offshore and onshore proposed Underground High Voltage Direct Current Cables (HVDC) to the proposed Converter Station and the proposed Underground High Voltage Alternating Current Cables (HVAC) between the proposed Converter Station and the Kiln Lane Substation.

1.2 Overview of survey approach

1.2.1 An Ecology Survey Strategy (ESS) was produced in March 2023, which explained the approach for ecological surveys to inform the baseline for the Proposed Onshore Scheme. The ESS set out the rationale and methods for how and when relevant ecological features would be identified to inform the design process. The aim of the ESS was to ensure that sufficient baseline data would be available to embed the mitigation hierarchy within the design, i.e. to avoid adverse impacts to valuable ecological features wherever possible, and to minimise any unavoidable adverse impacts.

1.2.2 Initial baseline ecological surveys commenced in 2023 on the basis of the Proposed Onshore Scheme EIA Scoping Boundary (shown in Figure 1.2 of the **EIA Scoping Report** (Ref 1)), which included the proposed Landfall Site at Walberswick and the Landfall Site at Southwold. Subsequently, the Draft Order Limits (DOL) has been fixed in late 2024, reflecting design development and representing a substantial reduction on the Proposed Onshore Scheme EIA Scoping Boundary, including the discounting of the Landfall Site at Southwold and the associated proposed Underground Cable Corridor (refer to **Chapter 3 Alternatives and Design Evolution)**. The initial stage of the ESS was to undertake Preliminary Ecological Appraisal (PEA) of all accessible areas within the Proposed Onshore Scheme EIA Scoping Boundary, comprising a desk study for existing biological records and a field survey. PEA of most of the boundary was completed in 2023, with additional PEA surveys in 2024 to fill data gaps for previously inaccessible land. PEA field survey comprised:

a. Mapping of the habitat types present following a published and recognised habitat classification that is appropriate for the site's location;

b. Scoring the condition of habitat types present in accordance with Defra Metric criteria to inform BNG assessment;
c. An assessment of the possible presence of protected or priority species, and (where relevant) an assessment of the likely importance of habitat features present for such species;
d. Mapping of any stands of non-native invasive plant species; and
e. Recording of any incidental sightings of priority or protected species, or field signs of such species.

1.2.3 In relation to reptiles and amphibians, PEA surveys included the mapping of any suitable habitats for these species and recording of any incidental encounters.

1.2.4 Desk study records and habitat suitability results from the PEA were reviewed at the end of the 2023 survey season to identify habitat features that could potentially support populations of protected/notable reptiles and amphibians.

1.2.5 Siting and routeing appraisals and other design development work was progressed in parallel with the PEA surveys in 2023, guided by emerging survey results. This design work refined the likely boundaries of the proposed Landfall Site, the proposed Underground Cable Corridor and associated temporary works.

Reptiles

1.2.6 The scope of reptile surveys for 2024 was determined on the basis of the results of the PEA compared with the emerging refined Draft Order Limits for the Proposed Onshore Scheme in late 2023, which still included the discounted Landfall Site at Southwold and the proposed Landfall Site at Walberswick. Habitat parcels with potential to support significant reptile populations were scoped in for further detailed survey in 2024 where there remained a risk of potential impacts to these features once embedded avoidance measures and likely boundary refinement were taken into account. This means that the spatial scope of these surveys responded to the evolving design to minimise unnecessary further survey of ecological features where it was clear that significant adverse impacts would be avoided, in accordance with the principles of the ESS.

1.2.7 Dedicated reptile surveys were not undertaken in locations where the only potential reptile habitat identified as being at risk of temporary impacts from the Proposed Onshore Scheme were narrow field margins of grassland and/or scrub, without notable reptile hibernation features, connected to more extensive suitable habitat that would not be impacted. Where such habitats could only feasibly support a small proportion of a wider reptile population, the presence of reptiles can be assumed without the need for further survey to inform mitigation requirements to prevent individuals from harm.

Amphibians

1.2.8 As detailed within the ESS, the Proposed Onshore Scheme is proposed to join the District Level Licensing (DLL) scheme for great crested newt (*Triturus*

cristatus). This is a type of strategic mitigation for great crested newt designed by Natural England to improve conservation outcomes and has no requirement to gather survey information to assess the impacts of the Proposed Onshore Scheme. Surveys for great crested newt were only undertaken where there was a risk of potentially licensable habitat damage from intrusive Ground Investigation (GI) surveys in 2024 at the discounted Landfall Site at Southwold. This is because these GI works would occur prior to the agreement of a DLL for the Proposed Onshore Scheme, and survey information on great crested newt presence/absence was therefore required to inform whether mitigation was necessary to facilitate the GI works.

1.2.9 Natterjack toad (*Epidalea calamita*) is very rare, and colonies are only considered to occur in a few locations at Minsmere and Sizewell within warm shallow pools on sand dunes and sandy heaths. These habitats do not occur within any areas at risk of impacts from the Proposed Onshore Scheme and no surveys for this species are therefore considered required.

1.2.10 As detailed in the ESS, impacts to waterbodies suitable for amphibian breeding will be avoided wherever possible. Any impacts to widespread amphibian species through loss of terrestrial habitat are likely to be temporary and not significant. No dedicated surveys for widespread amphibian species are therefore considered to be required to inform impact assessment.

1.3 Purpose and scope of this document

1.3.1 The purpose of this report is to present the results of reptile and amphibian surveys undertaken for the Proposed Onshore Scheme. The objectives of this report are to:

a. Undertake a review of reptile and amphibian species records associated with the Proposed Onshore Scheme;
b. Determine the presence or likely absence of any reptile populations in any suitable habitats at risk of impacts;
c. Determine a population size estimate of any reptile populations found to be present at risk of impacts;
d. Determine the presence or likely absence of great crested populations in suitable habitats at risk of impacts from GI works; and
e. Provide sufficient information to inform an assessment of the potential impacts to reptiles and amphibians as a result of the Proposed Onshore Scheme and to design appropriate mitigation measures (where required).

1.4 Legislation

1.4.1 A framework of international, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. Legislation relevant to and discussed within this report are:

a. The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'), as amended (Ref 2);

b. Wildlife and Countryside Act 1981, as amended (Ref 3);
c. Natural Environment and Rural Communities (NERC) Act 2006 (Ref 4); and
d. Countryside and Rights of Way (CroW) Act 2000 (Ref 5).

Reptiles

1.4.2 All native British reptile species are protected under Section 9 of the Wildlife and Countryside Act 1981 (Ref 4). This legislation makes it illegal to:

a. intentionally or deliberately kill, injure or take any reptile; and
b. possess or advertise/sell/exchange a reptile (dead or alive) or any part of a reptile.

1.4.3 The following reptile species are also Species of Principal Importance (SPI) for the purpose of conserving biodiversity in England, listed in accordance with the provisions of Section 41 of the NERC Act 2006 (Ref 4) which places a duty on public organisations to 'have regard' to the conservation of the following reptile species:

a. Adder (*Vipera berus*);
b. Common lizard (*Zootoca vivipara*);
c. Grass snake (*Natrix natrix*);
d. Sand lizard (*Lacerta agilis*);
e. Slow-worm (*Anguis fragilis*); and
f. Smooth snake (*Coronella austriaca*).

1.4.4 Smooth snake and sand lizard are afforded additional legal protection; however, these rare species have restricted ranges, and their distribution and habitat preferences are not represented within the study area. As such they are not considered further within this report.

1.5 Status at national level

Reptiles

1.5.1 Slow-worm and common lizard are widespread throughout England (Ref 6). Adder and grass snake are slightly less widespread and are more common in the south of England than in the north. Adders have decreased in range and number considerably over the past 50 years and are noted as priority species under the United Kingdom (UK) post-2010 Biodiversity Framework (Ref 7). Reptile populations across the UK are threatened by a number of factors including habitat degradation, fragmentation and loss, due to this species group's relatively low dispersal ability (Ref 8). Additionally, spread of disease and persecution are also considered likely to negatively impact reptile populations.

Amphibians

1.5.2 Great crested newt are widely distributed throughout the lowland areas of Great Britain. Their populations have declined over the last century across Europe,

including Britain, mainly because of habitat loss and deterioration. Other British amphibian species, including common toad (*Bufo bufo*), common frog (*Rana temporaria*), and smooth newt (*Lissotriton vulgaris*) are widespread across England. Palmate newt (*Lissotriton helveticus*) are also widespread across England although have a preference for acid-rich soils, therefore are most commonly found on heathland in the south and west.

1.5.3 Historically, great crested newt were listed as a *UK Biodiversity Action Plan (BAP)* species and are now listed as a species of 'principal importance for the conservation of biodiversity in England' in accordance with Section 41 of the *NERC Act 2006* (Ref 4). Following the production of *Biodiversity 2020* (Ref 9), the national strategy for England, actions were identified by experts to help in the recovery of populations of the Section 41 listed species. Actions identified for the recovery of great crested newt include the following:

a. Create, restore and manage ponds to provide breeding sites for great crested newt, and manage surrounding terrestrial habitats sympathetically;
b. Develop and implement methods and policies to remedy reversible adverse impacts at the population level, notably introduction of fish and invasive plants;
c. Develop and implement a surveillance plan to meet data needs at all spatial scales, for all appropriate stakeholders; and
d. Review land use regulation and propose changes to improve outcomes for great crested newt.

1.5.4 In addition, there are four species of amphibian listed on Section 41 of the *NERC Act 2006* (Ref 4). The act places a duty on public organisations to 'have regard' toward the conservation status of those species. Of the species listed, only two could feasibly be present within the Proposed Onshore Scheme EIA Scoping Boundary; great crested newt and common toad. These species were previously identified as requiring action in the UK BAP and continue to be regarded as conservation priorities.

1.6 Status at county level

Reptiles

1.6.1 Although reptiles were not previously listed on Suffolk's archived Biodiversity Plan (2003), the Suffolk Biodiversity Information Service (SBIS) (Ref 10) identifies adder, common lizard, grass snake, and slow worm as Priority Species for conservation in Suffolk. Therefore, these species are part of a broader effort to protect and enhance biodiversity in the county.

1.6.2 The Proposed Onshore Scheme EIA Scoping Boundary and broader east Suffolk landscape falls outside of the known distributions of both sand lizard (Ref 11) and smooth snake (Ref 12), with these species therefore not considered further within this report.

Amphibians

Great crested newt

1.6.3 Suffolk is noted as a stronghold for great crested newt particularly due to its high density of ponds. However, analysis of 2004-07 pond survey data indicated that populations in parishes with low pond densities may be on the verge of local extinction (Ref 13). Over 14% of the ponds surveyed contained great crested newt, although large and thriving populations were rare. The survey showed that a vast proportion of Suffolk's ponds were unsuitable for newts.

1.6.4 As one of Suffolk's flagship species, great crested newt are subject to targeted action to enable the species to recover and thrive in the county. As a result of pond survey work, Suffolk Wildlife Trust provides targeted pond restoration advice to landowners with follow-up visits to monitor success. Early monitoring of 50 ponds demonstrated that just one year following pond restoration, breeding great crested newt had returned to 23% of ponds where there had previously been none.

1.6.5 Suffolk's archived BAP (Ref 14) of 2003 outlined a series of proposed actions to protect and support great crested newt populations in line with national legislation. These measures aimed to address the primary threats to great crested newt in Suffolk, which are habitat loss, degradation and fragmentation of both ponds and terrestrial habitat, and predation by fish.

1.6.6 Key actions from the BAP (2003) included promoting favourable management of known sites by offering management advice to landowners and parish groups. Specific focus was placed on incorporating these practices into agri-environment schemes in areas where great crested newt may be present. Monitoring and surveying efforts were also integral to the BAP's strategy. Monitoring of all breeding sites on a five-year rolling programme, and undertaking surveys of the least recorded areas was promoted. This monitoring helps to track the population trends of great crested newt and informs conservation actions needed to support them. The BAP also highlighted the aim to restore the great crested newt population and/or key habitat on 20 sites.

1.6.7 Suffolk County Council's Local Nature Recovery Strategy (LNRS), set to be completed by mid-2025, is expected to further bolster conservation efforts for great crested newt. A key focus of the LNRS is the creation of Nature Recovery Networks, which aim to connect isolated habitats, promoting species migration and genetic exchange.

Common toad

1.6.8 The common toad is widespread throughout Suffolk, although as with many other areas in England the populations of this species are in decline. This is likely to be due to a combination of factors including habitat loss and fragmentation, changing farming practices and disease. As a result, the common toad which was

not previously listed on Suffolk's archived BAP, is now listed by SBIS as one of Suffolk's Priority Species for conservation. Therefore, the conservation of this species is part of a broader effort to protect and enhance biodiversity in Suffolk.

Natterjack toad

1.6.9 Natterjack toad became locally extinct in Suffolk during the 1950s-60s, although two populations have been re-established through translocation. Suffolk's archived BAP (Ref 15) of 2003 outlined a series of proposed actions to protect and support the remaining two colonies of translocated populations of Natterjack toads at Walberswick and Westleton. These measures aimed to address the primary threats to the species, including habitat loss and fragmentation.

1.6.10 Key actions from the BAP (2003) included promoting suitable management work on Sandlings Heaths to maintain translocated populations, the creation of additional pools to increase the breeding range of the toads within range of the existing colonies, and the re-establishment of heathland habitat between the two colonies to form a habitat link, reducing fragmentation. The BAP also highlighted the need to identify other sites which are suitable for additional translocations. Monitoring and surveying efforts were also integral to the BAP's strategy, including bi-annual monitoring at Westleton and Walberswick to assess the breeding success of populations.

1.7 Species-specific ecology

Reptiles

Grass snake

1.7.1 Due to a diet consisting largely of frogs, toads and newts, the grass snake generally utilises freshwater habitats near to areas of open grassland (Ref 6). Grass snake hibernacula often comprise of disused rabbit holes within well-drained slopes. Individuals can be observed basking near to hibernacula during the springtime, in the evening and early morning. Grass snakes lay shelled eggs, usually within compost heaps or similar areas providing warmth to aid incubation. Grass snakes can travel long distances, and have been tracked moving up to 4 km in a day (Ref 16).

Common lizard

1.7.2 Common lizard favours habitat which has a complex structure, for example mature grassland with scattered scrub, stone walls and heathland (Ref 6). Mating takes place in spring and females give birth to live young in August. The common lizard prefers open, sunny locations for basking and is usually found in dry, exposed locations where dense cover exists close by. Common lizards feed predominantly on spiders and insects. Common lizards often occupy very restricted areas and tend to move around much less than snakes (Ref 16).

Slow-worm

1.7.3 Slow-worm is commonly found in low-intensity managed grassland, sheltering and foraging within grass that has developed a thatch-like structure (Ref 6). Individuals are frequently located within disused hay meadows, landfill sites, gardens, allotments, highway verges and brownfield sites and are widespread throughout the UK. Slow-worm feed on slow-moving, soft-bodied prey items, particularly small slugs.

Adder

1.7.4 Adder are found throughout Britain, occurring most commonly in open habitats such as heathland, moorland, open woodland and sea cliffs (Ref 6). Mating takes place in April to May and female adders incubate their eggs internally, giving birth to live young in August to September. Adders feed largely on small rodents and lizards. They are creatures of habit, returning to the same hibernacula annually.

Amphibians

Great crested newt

1.7.5 The great crested newt annual cycle commences on emergence from hibernation. They will move from their hibernation sites between February and April toward breeding ponds. Great crested newt live and breed in a wide range of natural, semi-natural and man-made aquatic habitats including marshes, reed beds, wet ditches and ponds. Most adult newts move away from ponds and into terrestrial habitat between May and July. Suitable terrestrial habitat typically includes woodland, scrub, hedgerows and less intensively managed grassland. They seek out crevices and holes in the ground to spend the autumn, and regularly emerge to disperse and forage in warmer, wetter conditions. They will hibernate over winter once temperatures regularly fall below 5ºC overnight.

1.7.6 Great crested newt are known to range typically up to 500 metres from breeding ponds in search of feeding and hibernation sites (Ref 17). Some great crested newt have been found to move over considerable distances (up to 1.3km from breeding sites), however the majority inhabit an area much closer to the pond. The quality of the terrestrial habitat near to breeding ponds is important, as are the lack of barriers to dispersal (such as watercourses or busy roads).

1.7.7 Great crested newt often exist in metapopulations. A metapopulation is a group of associated populations. A metapopulation is made up from newts which breed in, and live around, a cluster of ponds. There will be some interchange of newts between ponds, although most adults consistently return to the same pond to breed. Metapopulations are much less vulnerable to habitat changes than populations based on single breeding ponds (Ref 17).

Other amphibian ecology

1.7.8 Similar to great crested newt, the annual cycle for other common British amphibian species also commences on emergence from hibernation. British amphibians are most active during the breeding season, which is typically between March and May, where they will be observed in or within proximity to standing water, such as a pond or wet ditch. During the summer months and into early autumn, amphibians will seek refuge within suitable terrestrial habitat (including woodland, scrub, grassland, and hedgerows) during the day, and emerge to feed during the night. As temperatures begin to drop in the winter months, amphibians will find deep shelter beneath rocks, logs and within crevices to avoid frost and continue to hibernate until the following spring (Ref 18).

2 Methodology

2.1 Reptiles

Desk study

2.1.1 A detailed biological records search was requested from the Suffolk Biodiversity Information Services (SBIS) in January 2023 to inform the design and assessment of the Proposed Onshore Scheme. This included a included a search for records of reptile from within a 2km radius of the Proposed Onshore Scheme EIA Scoping Boundary. An updated data search was conducted in April 2025 for a 2km search area of the Proposed Onshore Scheme EIA Scoping Boundary, excepting the now discounted Landfall Site at Southwold.

2.1.2 Records of reptiles over ten years old were omitted as they may not accurately represent the current status of populations in the area.

2.1.3 All potentially suitable habitats within the Proposed Onshore Scheme EIA Scoping Boundary were identified using data collected during PEA surveys, consisting;

a. Direct observations of reptiles;
b. Scoping of habitat areas with the potential to support reptiles; and
c. Assessment of habitat classification data to identify suitable habitat types.

Field survey

2.1.4 Areas with known reptile presence or the potential to support reptile populations were identified during the desk study, these were compared to the draft alignment for the Proposed Onshore Scheme available in late 2023. Where potential impacts to these areas remained likely, field based surveys were undertaken throughout 2024. The habitat composition and structure of each survey area, and their connectivity to suitable potential reptile habitats outside of the study area were recorded.

2.1.5 All surveys were undertaken by experienced ecologists meeting the Chartered Institute of Ecology and Environmental Management (CIEEM) competencies for reptile surveys (Ref 19). Surveys were undertaken in two defined areas within the ESS study area to inform scheme design. Survey area A was located to the west of Middleton, Survey area B was located near Southwold. Survey area A is shown on sheet 2 of **Annex A: Reptile Survey Area Plan** and survey area B is shown on sheet 1.

2.1.6 Artificial refugia comprising a mixture of squares (minimum size 0.5 metres squared) of bitumen roofing felt and corrugated onduline were distributed across key habitats within each of the two survey areas. A density of at least ten refugia per hectare was deployed. The position of each artificial refuge was recorded

using a data-enabled smart phone or tablet with ArcGIS software installed, giving location points accurate to approximately 5 metres. The number and density of artificial refugia within each survey area is summarised in **Table 2.1**.

2.1.7 Artificial refugia heat up during the day at a faster rate than the surrounding environment, thus making them attractive to cold-blooded reptiles for basking and shelter. Artificial refugia were left to 'bed in' for a minimum period of 14 days prior to surveys commencing to allow reptiles to become accustomed to their presence and to begin to make use of them.

Table 2.1: Number and density of artificial refugia.

Reptile survey area ID	Set up date	Number refugia deployed	Area of suitable habitat (ha)	Refugia density per ha
Area A	30/04/2024	30	3.0	10
Area B	29/04/2024 – 30/04/2024	80	5.9	14

2.1.8 Following the bedding in period, surveys were undertaken to check for reptiles. During each visit, both the artificial refugia and any existing debris/natural refugia were carefully approached to avoid disturbance of basking reptiles, then lifted and subsequently replaced. Visual searches of the general habitat and potential basking spots for reptiles were also conducted alongside refugia checks. Details including refuge location, species, number of individuals, life stage (adult, juvenile) and sex (when possible) were recorded electronically using the ArcGIS application, along with the weather conditions and date and time of survey. Each visit was completed by two suitably experienced ecologists during optimal weather conditions in line with guidance (Ref 20), as summarised below:

a. Time: conducted between 07:00 and 19:00.
b. Air temperature: between 10°C and 20°C.
c. Wind: still to moderate (no greater than Beaufort 4; 13-17 mph).
d. Rain: no or light rain only at time of survey. Surveys between periods of heavy rain, when all other conditions are suitable, are also acceptable.

2.1.9 Seven survey visits, in suitable weather conditions, were conducted at each survey area between April – June 2024 to determine presence or likely absence of common reptile species. If reptiles were recorded during these initial seven visits, a further 13 visits were undertaken between June – September 2024 to estimate population size at each individual site. Both survey areas were subject to the full population estimate surveys.

2.1.10 It is good practice to space survey visits out across the optimal months to extend the sampling period, ensure a range of environmental conditions are encountered during the survey and increase the likelihood of reptiles discovering the artificial refugia, therefore survey visits were spaced at least three days apart.

Evaluation of results

Population size and density assessment

2.1.11 Population size and the importance of a reptile population was assessed according to categories described under the Froglife Advice Sheet 10 (Ref 20). This advice identifies site importance for reptiles according to the maximum number of adult animals recorded during a single survey visit, where artificial refugia are at a density of 10 per hectare. As shown in **Table 2.1**, refugia density at Survey area B was greater than ten per hectare.

2.1.12 The population size and density assessment was undertaken using a combination of records of reptiles observed underneath and on top of the artificial refugia, and within adjacent habitats.

2.1.13 Each population category present was awarded a score, and these were totalled to estimate survey area importance. Categories are summarised in **Table 2.2**.

Table 2.2: Reptile population score categories – adapted from Froglife Advice Sheet 10 (Ref 20).

Species	Low population (Score 1)	Good population (Score 2)	Exceptional population (Score 3)
Slow-worm	< 5	5-20	>20
Common lizard	< 5	5-20	>20
Adder	< 5	5-10	>10
Grass snake	< 5	5-10	>10

2.1.14 A population density score was calculated for each population present using the peak count (maximum number of adults recorded over a single visit) divided by the area of the habitat available. The population density categories are given in **Table 2.3**. The guidance (Ref 21) does not indicate the density of refugia to be used to calculate population densities of reptile species; however, as good coverage of artificial refugia was achieved across each survey area, the estimated population density is judged to be a fair representation.

Table 2.3: Reptile population density categories – adapted from Herpetofauna Groups of Great Britain and Ireland (Ref 21).

Species	Population density (/ha) Low	Medium	High
Slow-worm	< 50	50 – 100	> 100
Common lizard	< 20	20 – 80	> 80
Adder	< 2	2 – 4	> 4
Grass snake	< 2	2 – 4	> 4

2.1.15 Generally, survey areas are classified as of importance to reptile species if they comply with any one of the following:

a. Support three or more reptile species;
b. Support two snake species;
c. Support an exceptional population of one species;
d. Support an assemblage of species scoring at least four (according to a total score calculated from **Table 2.1** above); and
e. Are of significant regional importance due to local rarity.

2.1.16 The overall value of the habitats within the proposed Onshore Scheme for reptiles also takes into account several other factors, as detailed below:

a. The quality and rarity of the habitat and populations;
b. How connected the populations are to the wider area;
c. The local significance of the populations; and
d. The estimated size of the populations.

2.2 Amphibians

Desk study

2.2.1 A detailed biological records search was requested from the Suffolk Biodiversity Information Services (SBIS) in January 2023 to inform the design and assessment of the Proposed Onshore Scheme. This included a search for records of amphibians from within a 2km radius of the Proposed Onshore Scheme EIA Scoping Boundary. An updated data search was conducted in April 2025 for a 2km search area of the Proposed Onshore Scheme EIA Scoping Boundary, excepting the now discounted Landfall Site at Southwold.

2.2.2 Records of reptiles over ten years old were omitted as they may not accurately represent the current status of populations in the area.

2.2.3 The MAGIC web database (Ref 22) was also used to review any granted Natural England great crested newt mitigation licenses within a 2km radius of the Proposed Onshore Scheme EIA Scoping Boundary.

2.2.4 All potentially suitable habitats within the Proposed Onshore Scheme EIA Scoping Boundary were identified using data collected during PEA surveys, consisting;

a. Direct observations of amphibians;
b. Scoping of habitat areas, including breeding waterbodies, with the potential to support amphibians; and
c. Assessment of habitat classification data to identify suitable habitat types.

Field survey

2.2.5 Where waterbodies with the potential to support great crested newt were at risk of impacts in relation to GI surveys, field surveys were undertaken. This was limited to one location at the discounted Landfall Site at Southwold, comprising

an area of coastal floodplain grazing marsh, within and around Easton Marshes County Wildlife Site.

Habitat suitability index assessment

2.2.6 Suitable waterbodies highlighted during the desk study were subject to an initial walkover (ground truthing) exercise to verify the existence of the waterbody. Where appropriate, a Habitat Suitability Index (HSI) assessment for great crested newt was completed on all accessible waterbodies within the study area using the standardised HSI methodology (Ref 23). HSI surveys were undertaken on 19 April 2024.

2.2.7 Habitats and features within the landscape that are known to benefit amphibian populations at different stages through the year for breeding, foraging, shelter and hibernation include (Ref 24):

a. Unshaded waterbodies with emergent and submerged vegetation, which rarely dry out;
b. Unimproved and semi-improved grassland, swamps, hedgerows and scrub
c. Connecting semi-natural habitat between ponds such as rough grassland, stone walls, hedgerows, scrub and trees;
d. Log piles and stone walls to provide refuge; and.
e. Absence of predators, such as fish or wildfowl.

2.2.8 The HSI is a measure of suitability and incorporates ten indices, as shown in **Table 2.4**, all of which are environmental factors based on the above habitat preferences for great crested newt at different stages during their lifecycle.

Table 2.4: Habitat suitability index (HSI) criteria.

Suitability indices	Factor
SI1	Geographic location
SI2	Pond area
SI3	Permanence
SI4	Water quality
SI5	Shade
SI6	Waterfowl
SI7	Fish
SI8	Additional ponds within 1 km
SI9	Terrestrial habitat
SI10	Macrophyte cover

2.2.9 Each of the suitability indices is scored as a number between 0 and 1, a geometric mean of ten suitability indices is then calculated to produce the HSI score.

2.2.10 The HSI score is there also expressed as a number between 0 and 1, with 0 being unsuitable habitat and 1 representing optimal habitat, as summarised below. It is considered that ponds with a higher overall HSI score are more likely to support great crested newt than those with a lower score. The method is not sufficiently precise to conclude that ponds with a high score will support newts, or that any pond with a low score will not. It is therefore a tool to support, rather than a substitute for, great crested newt surveys.

a. 0 to 0.5 = poor suitability for great crested newt;
b. 0.51 to 0.59 = below average suitability for great crested newt;
c. 0.6 to 0.69 = average suitability for great crested newt;
d. 0.7 to 0.79 = good suitability for great crested newt; and
e. 0.8 to 1= excellent suitability for great crested newt.

2.2.11 The standard HSI assessment (Ref 25) above was developed for ponds and cannot be applied readily to a ditch system due to its linear and interconnected nature. A simplified suitability score for ditches was formulated by The Environment Partnership (Ref 26) to generate a suitability score based on key ditch characteristics (**Table 2.5**); this simplified HSI assessment for ditches has previously been accepted as an appropriate survey method by Natural England on the Hinkley Point C Connection Stage 4 project.

2.2.12 Ditches found to have an overall positive or neutral score using the five ditch characteristics would be subject to further survey (i.e., eDNA or presence/absence survey). A sixth characteristic, water flow, was also applied to the ditch HSI. Where water flow was assessed to be fast, the ditches were scoped out as they would not provide suitable breeding habitat for great crested newt. Although this does not fully replicate the standard “pond-oriented” HSI, it does provide a consistent and efficient characterisation of the ditches in respect of amphibian breeding requirements. Positive scores were assumed when there was a level of uncertainty towards the criteria.

Table 2.5: Ditch habitat suitability scoring system.

Ditch characteristic	Negative measure	Score	Positive measure	Score
Permanence	Dry or dries annually	-2	Wet (even water distribution, water level >5cm deep)	+1
Vegetation	No suitable egg laying plants present	-1	Suitable egg laying plant present	+1
Fish	Present	-1	Absent	+1
Shade	Shaded (>60% shaded, 1m from shore)	-1	Not shaded (>40% open 1m from shore)	+1

Ditch characteristic	Negative measure	Score	Positive measure	Score
Water quality	Poor (e.g. evidence of pollution or enrichment)	-1	Moderate/Good (no evidence of pollution or enrichment	+1

eDNA survey

2.2.13 Environmental deoxyribonucleic acid (DNA) analysis, known as eDNA, is a technique developed to detect the DNA of a target species, such as great crested newt, in the environment. When great crested newt inhabit a pond, cells containing their DNA are sloughed off into the water. The eDNA survey involved the collection of 20 water samples at regular points from around the perimeter of a waterbody, following the field protocol outlined within the Defra Technical Advice Note. The samples are analysed in laboratories using DNA amplification techniques, to identify whether the target species is present.

2.2.14 Each of the waterbodies passed the HSI assessment and were subject to eDNA survey. Each of the waterbodies are located to the north of Southwold, within the floodplain wetland mosaic associated with Easton Marshes County Wildlife Site. This is show within the Great Crested Newt Waterbody Survey Location Plan which is Annex D of this report.

2.2.15 Laboratory analysis was completed to determine the presence of great crested newt. The methods used for water sample collection and eDNA analysis were as described by Biggs et. al. (Ref 27), with samples taken on the 26 April 2024. This is in line with best practice guidance which states that samples can be taken between 15 April and the 30 June.

2.3 Assumptions and limitations

Reptiles

2.3.1 Reptiles are mobile animals with some, such as grass snake, occupying large home ranges. Therefore, they may occur as transient individuals in survey areas connected to wider areas that support these species. Where reptiles have not been identified as occupying a survey area during the initial seven survey visits, this does not guarantee their absence. There is always the risk of reptiles not using artificial refugia, particularly in areas where there is an abundance of natural basking and shelter features. Large areas of natural habitat combined with potentially low population densities could lead to individuals going undetected. However, the level of survey effort undertaken is anticipated to have detected the reptile species present within the study area.

2.3.2 All 30 refugia installed at survey area A were surveyed for the entire window. However, the 13 refugia placed along the embankment at survey area B were only able to be surveyed for the first 12 visits; after 21 June 2024, the refugia were

inaccessible due to dense scrub. Moreover, a small number of refugia installed at survey area B were occasionally lost to bramble and not replaced. Given the high refugia density in survey area B, this is not considered to be a constraint.

2.3.3 Occasionally, the weather conditions did not meet optimal conditions for a reptile survey, although given that this is a coastal site, higher wind speeds are to be expected, and it was considered to be impractical to cancel surveys for this reason. Surveys were rescheduled if the weather conditions, such as heavy rain, were considered to be a significant limitation.

Amphibians

2.3.4 Pond 2 was difficult to assess for the HSI assessment as the first 5m of water from the bank are dominated by dense common reed *Phragmites australis*. The open central area was not visible to determine macrophyte growth. The pond was assessed on a precautionary basis, therefore macrophyte coverage may have been overestimated. This is not considered to be a significant limitation as the pond was later subject to eDNA survey.

2.3.5 Two of the ditches returned inconclusive eDNA results, although this is not considered to be a significant limitation given that all of the other waterbodies returned negative eDNA results, and these ditches are part of a highly interconnected ditch matrix. Furthermore, one of these ditches (Ditch 8) achieved a low ditch habitat suitability score of 1, indicating it is likely that it would have also returned a negative eDNA result.

3 Results

3.1 Reptiles

Desk study

3.1.1 Data returned from SBIS indicated the widespread presence of slow-worm, grass snake, adder and common lizard within 2km of the Proposed Onshore Scheme EIA Scoping Boundary, with over 200 records for reptiles dated within the last ten years. The locations of these records are summarised below:

a. Slow-worm at Blythburgh, Dunwich, Leiston, Thorpness, Saxmundham Walberswick and Westleton.
b. Adder at Dunwich, RSPB Minsmere, Sizewell, Westleton and Walberswick,
c. Common lizard at Blythburgh, Dunwich, Friston, Leiston, Saxmundham, Southwold, Snape, Westleton and RSPB Minsmere.
d. Grass snake at Blythburgh, Dunwich, Knodishall, Middleton, RSPB Minsmere, Saxmundham, Sizewell, Theberton, Walberswick and Westleton.

Field survey

3.1.2 Two potential reptile sites with potential to be impacted were identified during the desk-based scoping exercise. These areas are shown in **Annex A: Reptile Survey Area Plan**.

Survey area A

3.1.3 Survey area A is located in the southern half of the Proposed Onshore Scheme, to the west of Middleton. The suitable reptile habitat was approximately 3 hectares and consisted of newly planted mixed broadleaved and yew woodland, with the young trees planted in rows and comprising species such as field maple (*Acer campestre*), hazel (*Corylus avellana*), spindle (*Euonymus europaeus*), ash (*Fraxinus excelsior*), birch (*Betula spp.*), pedunculate oak (*Quercus robur*) and wild cherry (*Prunus avium)*. The rough grassland in between the rows of trees provided good potential reptile foraging habitat. Plentiful natural refugia provided good cover and foraging opportunities for reptiles.

Inset 3.1: Survey area A representative habitat., including potential hibernacula.

Survey area B

3.1.4 Survey area B is located at the north of the Proposed Onshore Scheme within the discounted Landfall Site at Southwold. The survey area is within the coastal floodplain grazing marsh mosaic associated with Easton Marshes County Wildlife Site.

3.1.5 Survey area B is split into two defined areas:

a. The eastern section of survey area B is located within Easton Marshes County Wildlife Site. The suitable reptile habitat extends to approximately 5.4 hectares and consists of a mosaic of reedbed, rough modified grassland, acid grassland, tall ruderal vegetation and scrub alongside several well-connected ditches and ponds. A mixture of tall sward and short grass created a complex vegetation structure, providing good basking and foraging habitat for widespread reptile species; and

b. In the western section of survey area B, the suitable reptile habitat extends to approximately 0.5 hectares and consists of a raised earth bank between two ditches within the coastal floodplain grazing marsh mosaic, outside of Easton Marshes County Wildlife Site. The bank was dominated by tall ruderals and tall grass species, with scattered bramble (*Rubus fruticosus agg.*) scrub, providing good cover and foraging opportunities for reptiles.

Inset 3.2 Survey area B eastern section representative habitat.

Inset 3.3: Survey area B western section representative habitat.

Reptile presence/absence and population estimate survey

3.1.6 Surveys identified the presence of two species of reptile (grass snake and common lizard) within the Proposed Onshore Scheme EIA Scoping Boundary.

3.1.7 The results from each survey area are discussed in detail below, including population size class and estimated population densities, with summaries of population size class and estimated population density provided in **Annex A: Reptile Survey Area Plan**. Survey results are shown in **Annex B: Reptile Survey Results Plan**, whilst full survey results can be found in **Annex C: Reptile Survey Results**, which includes both records of reptiles using artificial refugia and incidental records of reptiles during the surveys.

Survey area A

3.1.8 Grass snake was recorded at survey area A during the surveys. The peak adult count of four grass snakes was recorded on 16 September 2024, all four were

unidentified adults. A single common lizard was recorded during a single survey visit (16 September 2024), this was an unidentified adult. No other records for common lizard were identified at this survey area.

3.1.9 Survey area A supports a 'low' population size class of grass snake. The estimated population density of grass snake is 1.3 adults per hectare and therefore survey area A supports an estimated low population density of this species.

Survey area B

3.1.10 Grass snake and common lizard were recorded at survey area B. The peak adult count of seven grass snakes was recorded on 4 June 2024, including two males, two females and three unidentified adults. The peak adult count of 27 common lizards was recorded on 29 May 2024, which included six males, 12 females and nine unidentified adults.

3.1.11 Survey area B supports a 'good' population size class of grass snake. The estimated population density of grass snake is 1.2 adults per hectare and therefore survey area B supports an estimated low population density of this species.

3.1.12 Survey area B supports an 'exceptional' population size class of common lizard. The estimated population density of common lizard is 4.6 adults per hectare and therefore survey area B supports an estimated low population density of this species.

3.1.13 Incidentally, during reptile surveys at survey area B, a water shrew (*Neomys fodiens*) was observed on 21 June 2024.

Reptile population summary

3.1.14 A summary of the number of reptiles recorded at each survey area is presented in **Table 3.1** below, together with population categories and calculated reptile densities. A full list of results, including refugia densities, full weather conditions recorded during surveys and survey results are presented in **Annex C: Reptile Survey Results**.

Table 3.1: Reptile survey results by species and survey area, for survey areas supporting a reptile population

Survey area and species	Maximum number adults recorded during single visit (peak count)	Maximum number adults and juveniles recorded during single visit	Area of reptile habitat (Ha)	Population score (refer to Table 2.1)	Estimated population density (refer to Table 2.2)
Survey area A					
Grass snake	4	5	3.0	Low	Low

Survey area and species	Maximum number adults recorded during single visit (peak count)	Maximum number adults and juveniles recorded during single visit	Area of reptile habitat (Ha)	Population score (refer to Table 2.1)	Estimated population density (refer to Table 2.2)
Common lizard	1	1	3.0	Low	Low
Survey area B					
Grass snake	7	9	5.9	Good	Low
Common lizard	27	31	5.9	Exceptional	Low

Assessment of importance

3.1.15 As per the criteria described in **Paragraph 2.1.15**, each survey area was assessed to evaluate its importance for reptiles. Survey area B was assessed as an important reptile site. **Table 3.2** below provides full results for the assessment of each survey area with reptiles present, against every criterion.

Table 3.2: Assessment of importance of survey area where reptiles were present.

Survey area	Three or more reptile species	Two snake species	Exceptional population of one species?	Assemblage of species scoring at least 4?	Significant regional importance	Important site?
Survey area A	No	No	No	No	No	No
Survey area B	No	No	Yes	Yes	No	Yes

3.2 Amphibians (including great crested newt)

Desk study

SBIS data search

3.2.1 The data search results from SBIS returned over 150 records of amphibians dated within the past 10 years, within 2km of the Proposed Onshore Scheme EIA Scoping Boundary. The locations of these records are summarised below:

a. Common frog at Dunwich, Friston, Knodishall, Leiston, Middleton, Saxmundham, Southwold, Theberton Woods and Walberswick.
b. Common toad at Dunwich, Knodishall, Leiston, Middleton and Saxmundham.
c. Natterjack Toad at Walberswick to Minsmere designated site.

d. Great Crested New at Benhall, Darsham, Friston, Hinton, Knodishall, Leiston, Middleton, Theberton, Westleton and Yoxford.
e. Smooth newt at Dunwich, Friston, Hinton, Knodishall, Leiston, Middleton, Saxmundham, Theberton Woods, Walberswick and Westleton.

Existing great crested newt mitigation licences

3.2.2 A search for current and historic great crested newts mitigation licences identified three great crested newt mitigation licences within 2km of the Proposed Onshore Scheme EIA Scoping Boundary:

a. Licence allowing damage and destruction of a resting place, 550m north at Clay Common.
b. Licence allowing destruction of a resting place, 700m west at Thorington.
c. Licence allowing destruction of a breeding site and a resting place, 800m west at Thorington.

Field study

3.2.3 The surveyed waterbodies were located within coastal floodplain grazing marsh north of Southwold, within and adjacent to Easton Marshes County Wildlife Site, which comprises reedbed, rough modified grassland, acid grassland, tall ruderal vegetation and scrub.

3.2.4 All waterbodies subject to field survey are shown in **Table 3.3** and **Table 3.4** and are described in Annex E: Waterbody descriptions summary table.

Habitat suitability index

3.2.5 In total, 11 waterbodies were deemed suitable for HSI assessments, including two ponds and nine ditches. Ther results of the HSI assessment are shown within the table below.

Table 3.3: Summary of HSI scores for ponds and ditches.

Waterbody ID	Survey date	HSI score
Ponds		
Pond 1	19/04/2024	0.71
Pond 2	19/04/2024	0.82
Ditches		
Ditch 1	19/04/2024	5
Ditch 2	19/04/2024	5
Ditch 3	19/04/2024	5
Ditch 4	19/04/2024	5
Ditch 5	19/04/2024	3
Ditch 6	19/04/2024	5

Waterbody ID	Survey date	HSI score
Ditch 7	19/04/2024	3
Ditch 8	19/04/2024	1
Ditch 9	19/04/2024	3

eDNA survey

3.2.6 Nine of the waterbodies returned negative eDNA results and an additional two returned inconclusive results as summarised in **Table 3.4**.

Table 3.4: Great crested newt eDNA survey results.

Waterbody ID	Inhibition Control †	Degradation Control §	Great Crested Newt Presence (0=negative) *	Negative polymerase chain reaction (PCR) Control^	Positive PCR Control #
Pond 1	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Pond 2	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 1	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 2	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 3	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 4	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 5	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 6	0 of 2	Evidence of degradation or residual inhibition	Indeterminate	0 of 4	4 of 4
Ditch 7	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4
Ditch 8	2 of 2	Evidence of degradation	Indeterminate	0 of 4	4 of 4
Ditch 9	2 of 2	Within Limits	0 of 12	0 of 4	4 of 4

*If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.

† Recorded as the number of positive replicate reactions at expected. If the expected replicate reactions is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

^ Negative control test expected to 0 as a valid control

Positive control test expected to be 4 out of 4 as a valid control

4 Conclusions

4.1 Reptiles

4.1.1 Grass snake populations were found in both survey areas, with a 'low' population size class and population density in Survey area A and a 'good' population size class and 'low' population density in Survey area B.

4.1.2 Common lizard populations were found in both survey areas, with a 'low' population size class at survey area A and an 'exceptional' population size class at survey area B. Common lizard population density within both survey areas was estimated to be low.

4.1.3 The presence of good and exceptional populations within survey area B renders it an important site for reptiles. Therefore, habitats within the vicinity of these areas should be considered of high conservation value for reptiles.

4.1.4 Both grass snake and common lizard are considered widespread and locally common in Suffolk.

4.2 Amphibians

4.2.1 Following eDNA surveys, nine waterbodies returned a negative result for the presence of great crested newt. Whilst an additional two waterbodies returned an inconclusive eDNA result, given their direct connectivity to the wider ditch network, these can reasonably be assumed also to not support great crested newt.

4.2.2 Therefore, great crested newt are found to be absent from the surveyed waterbodies and none of the waterbodies were subject to further population size assessment surveys using traditional methods.

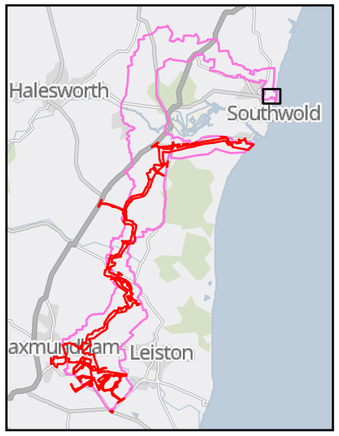
4.2.3 The ditches and ponds subject to HSI assessment and eDNA survey have potential to support other common and widespread amphibian species, such as common toad, common frog and smooth newt.

Annex A: Reptile Survey Area Plan

Reptile refugia

Proposed Onshore Scheme Draft Order Limits

Proposed Onshore Scheme Scoping Boundary



Coordinate System: British National Grid

Metres

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Rev	Date	By	Chkd	Appd	Authd
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Tel +44 20 7636 1531
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Reptile Survey Area Plan

Sheet 1 of 2

Scale at A3

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Role

Herpetofauna Report

Suitability

For Information

Project Number

287334-00

Rev

02

Drawing Number

LL-ARP-FIG-ENV-0161-P01

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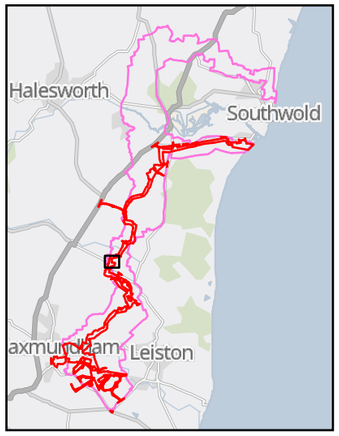
Reptile refugia

Proposed Onshore Scheme Draft Order Limits

Proposed Onshore Scheme Scoping Boundary



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Annex B: Reptile Survey Results Plan

- Refugia where Common Lizard and Grass Snake encountered
- Refugia where Common Lizard encountered
- Refugia where Grass Snake encountered
- Reptile refugia
- Proposed Onshore Scheme Draft Order Limits
- Proposed Onshore Scheme Scoping Boundary

Coordinate System: British National Grid

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Drawing Number

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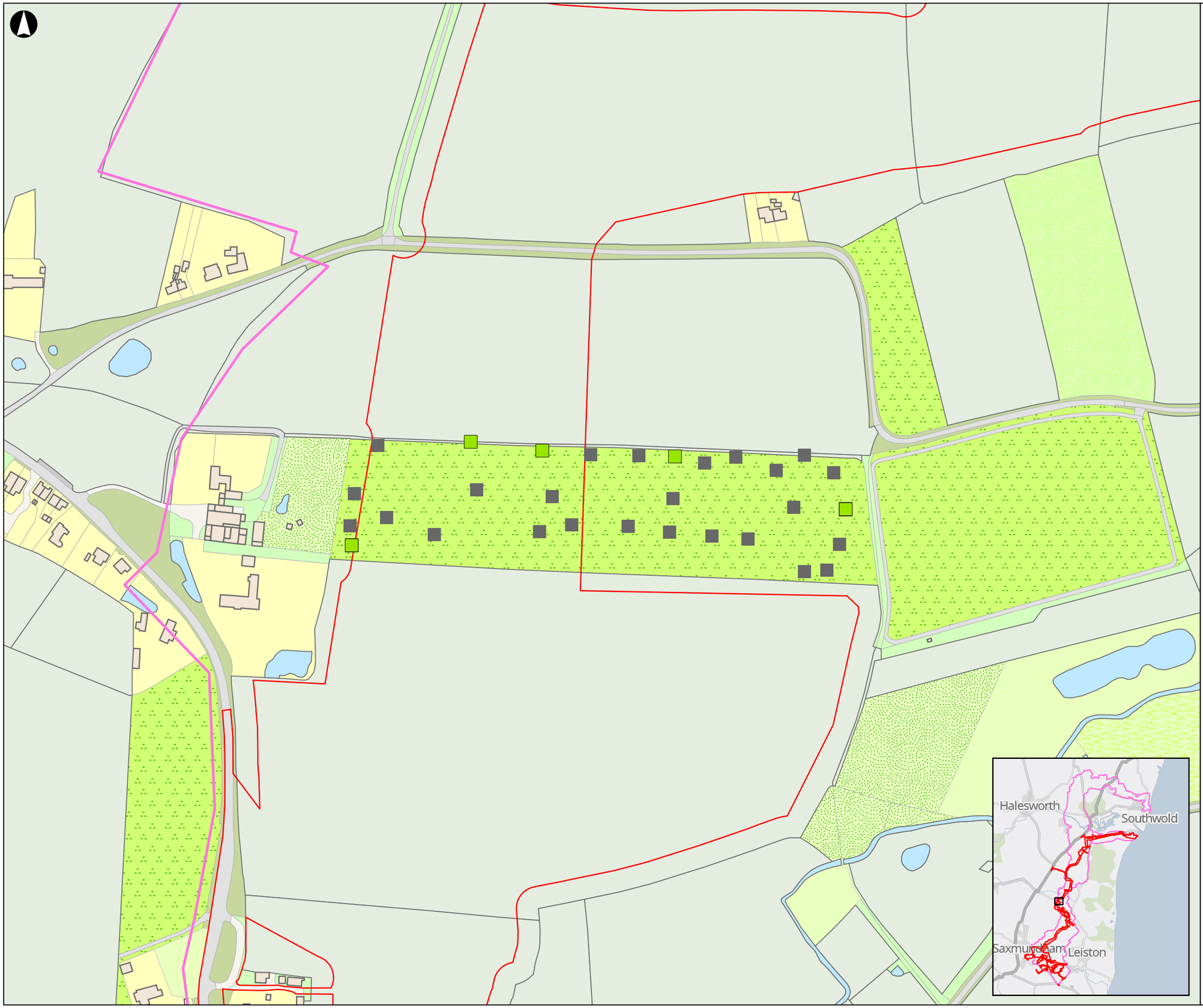

Refugia where Common Lizard and Grass Snake encountered

Refugia where Common Lizard encountered

Refugia where Grass Snake encountered

Reptile refugia

Proposed Onshore Scheme Draft Order Limits

Proposed Onshore Scheme Scoping Boundary

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Reptile Survey Results Plan

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Annex C: Reptile Survey Results

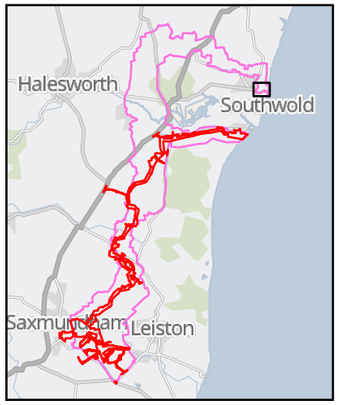
Site	Site set up date	Site size (Ha)	Total no. refugia placed	Refugia density per Ha	Visit No.	Survey date	Weather conditions				No of grass snake					No of common lizard				
							Start Temp (°C)	Rain	Wind (0-8)	Cloud (0-8)	Adult M	Adult F	Adult Unk	Juv	Total GS per visit	Adult M	Adult F	Adult Unk	Juv	Total CL per visit
Survey Area A	30/04/2024	3	30	10	Set up	30/04/2024	12	Dry	3	3			1		1					0
					1	09/05/2024	12	Dry	4	4					0					0
					2	13/05/2024	14	Dry	1	3					0					0
					3	16/05/2024	13	Light rain	2	8					0					0
					4	20/05/2024	14	Dry	1	3					0					0
					5	23/05/2024	14	Dry	5	8		1			1					0
					6	28/05/2024	11	Dry	2	2	1			1	2					0
					7	30/05/2024	13	Dry	5	7	1				1					0
					8	03/06/2024	16	Dry	3	6	1				1					0
					9	06/06/2024	12	Dry	2	3					0					0
					10	10/06/2024	13	Dry	6	5		1			1					0
					11	13/06/2024	12	Dry	3	2	1				1					0
					12	17/06/2024	13	Dry	3	1		1			1					0
					13	20/06/2024	13	Dry	1	1	1	1			2					0
					14	24/06/2024	14	Dry	1	0		1			1					0
					15	04/09/2024	15	Dry	2	2					0					0
					16	11/09/2024	10	Dry	2	3					0					0
					17	16/09/2024	15	Dry	1	2			4	1	5			1*		1
					18	18/09/2024	15	Dry	1	4	1				1					0
					19	23/09/2024	17	Dry	3	4					0					0

Site	Site set up date	Site size (Ha)	Total no. refugia placed	Refugia density per Ha	Visit No.	Survey date	Weather conditions				No of grass snake					No of common lizard				
							Start Temp (°C)	Rain	Wind (0-8)	Cloud (0-8)	Adult M	Adult F	Adult Unk	Juv	Total GS per visit	Adult M	Adult F	Adult Unk	Juv	Total CL per visit
					20	25/09/2024	11	Dry	0	8					0					0
						Total catch					**6**	**5**	**5**	**2**	**18**	**0**	**0**	**1**	**0**	**1**
Survey area B	29/04/2024 – 30/04/2024	5.9	83	14	Set up	29/04/2024	13	Dry	3	2			1		1					0
					Set up	30/04/2024	12	Dry	3	3			2		2					0
					1	09/05/2024	12	Dry	4	4					0	2	2	1		5
					2	13/05/2024	14	Dry	1	3					0	4	4	1		9
					3	17/05/2024	13	Dry	2	3					0	3	2	2	4	11
					4	21/05/2024	15	Dry	4	8			3	2	5	8	11	4	8	31
					5	24/05/2024	13	Dry	3	1				3	3	1	1	8	1	11
					6	29/05/2024	14	Dry	4	7	1	1	3	3	8	6	12	9	1	28
					7	04/06/2024	14	Dry	2	8	2	2	3	2	9	2	6	3		11
					8	07/06/2024	13	Dry	3	1	3		1	1	5	3	5	9	1	18
					9	11/06/2024	10	Dry	3	3	2		1	1	4	1	1	6		8
					10	14/06/2024	13	Light rain	4	8	2	2			4	3	3			6
					11	18/06/2024	13	Dry	2	2		2			2		6	1	1	8
					12	21/06/2024	11	Dry	2	0			1	1	2		1	2		3
					13	25/06/2024	14	Dry	2	0		2			2		4	1		5
					14	28/06/2024	14	Dry	5	0	1		1	1	3					0
					Site walkover	20/08/2024							2		2	1		1	1	3

Site	Site set up date	Site size (Ha)	Total no. refugia placed	Refugia density per Ha	Visit No.	Survey date	Weather conditions				No of grass snake					No of common lizard				
							Start Temp (°C)	Rain	Wind (0-8)	Cloud (0-8)	Adult M	Adult F	Adult Unk	Juv	Total GS per visit	Adult M	Adult F	Adult Unk	Juv	Total CL per visit
					15	05/09/2024	17	Light rain	4	5	1				1					0
					16	10/09/2024	14	Dry	3	7	1	2		2	5	4	2	1	1	8
					17	12/09/2024	11	Dry	2	2		1	1		2	2	1			3
					18	17/09/2024	16	Dry	3	4	1		1	1	3	8	1	2	1	12
					19	19/09/2024	15	Dry	2	8					0	1			7	8
					20	24/09/2024	15	Dry	3	8					0	2	2	2	9	15
						Total catch					**14**	**12**	**20**	**17**	**63**	**51**	**64**	**53**	**35**	**203**

Annex D: Great Crested Newt Waterbody Survey Location Plan

Surveyed Pond
Surveyed Ditches
Proposed Onshore Scheme Draft Order Limits
Proposed Onshore Scheme Scoping Boundary



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Project Name

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Drawing Title

Great Crested Newt Waterbody Survey Location Plan

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Role

Herpetofauna Survey

Suitability

For Information

Project Number

287334-00

Rev

02

Drawing Number

LL-ARP-FIG-ENV-0163-P01

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Annex E: Waterbody descriptions summary table

Waterbody ID	Description of waterbodies
Ponds	
Pond 1	Pond within coastal floodplain grazing marsh, which features areas of open water and fringes with varied fen vegetation. The pond is likely to contain fish and never dries up. Likely to have some saline influence. Water-quality is good.
Pond 2	Pond on the edge of the coastal floodplain marsh reedbed. Difficult to assess as the first 5m are dominated by dense common reed *Phragmites australis* but there is an open central area, which was not visible to determine macrophyte growth. Duckweed *Lemna sp.* is present. Marginal vegetation is indicative of saline influence.
Ditches	
Ditch 1	Part of the ditch matrix within the coastal floodplain grazing marsh mosaic. Deep ditch running from north to south, with dense common reed on both edges. Good habitat diversity within surrounding landscape, including rough grassland and scrub. It was considered to have high suitability for water voles.
Ditch 2	Part of the ditch matrix within the coastal floodplain grazing marsh mosaic. Dominated by common reed with very few other plant species. Fish were visible in the ditch.
Ditch 3	Part of the ditch matrix within the coastal floodplain grazing marsh mosaic. Common reed is dominant at the edges of the ditch, although open water is present. Transects with ditch 4 at the mid-point. Small patches of dense bramble scrub are present along the length.
Ditch 4	Part of the ditch matrix within the coastal floodplain grazing marsh mosaic. Common reed is dominant at edges, but open water is present within ditch. A crossing is present at the western end.
Ditch 5 – Ditch 9	Ditches 5-9 are all similar in management and composition and have therefore been grouped together. They are open ditches which form part of grazing marsh grazing marsh mosaic. These ditches have a higher diversity of marginal aquatic vegetation, with grass and rushes extending into the water. Minor amount of Invasive Non-Native Species (INNS) water fern *Azolla filiculoides* present in the north west of the ditch matrix. Common reed is more dominant towards the east of the ditch matrix.

Glossary and Abbreviations

Term	Definition
BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
CIEEM	Chartered Institute of Ecology and Environmental Management
CroW	Countryside and Rights of Way
DLL	District Level Licensing
DNA	Deoxyribonucleic acid
ESS	Ecology Survey Strategy
GI	Ground Investigation
GW	Gigawatts
HSI	Habitat Suitability Index
HVAC	High Voltage Alternating Current Cables
HVDC	High Voltage Direct Current Cables
LNRS	Local Nature Recovery Strategy
NERC	Natural Environment and Rural Communities
PEA	Preliminary Ecological Appraisal
The Proposed Scheme	The term Proposed Scheme will be used when referring to the GB scheme components as a whole and will not include the Dutch components.
The Proposed Onshore Scheme	The term used when referring to the onshore components of the Proposed Scheme.
SBIS	Suffolk Biodiversity Information Services
UK	United Kingdom

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National Grid LionLink Limited

Company number 14722364

1-3 Strand

London

WG2N-5EH

United Kingdom

nationalgrid.com/lionlink