



CLEVE HILL SOLAR PARK

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UPDATED EXTENDED PHASE 1 HABITAT SURVEY

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UPDATED EXTENDED PHASE 1 HABITAT SURVEY REPORT

CLEVE HILL SOLAR PARK

**FOR CLEVE HILL SOLAR PARK LTD
NOVEMBER 2018**



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1 INTRODUCTION

1.1 Overview

This report presents the findings of an updated extended Phase 1 Habitat Survey undertaken on land at Cleve Hill, Kent, approximately 2 km northeast of Faversham, Kent ('the Site'). The Site has an Ordnance Survey National Grid Reference centred on: TR 03642 63932.

This Updated Extended Phase 1 Habitat survey report been prepared by Arcus Consultancy Services Limited (Arcus) on behalf of Cleve Hill Solar Park Ltd ('the Applicant'). This document provides results only; any assessment of potential disturbance and harm to habitats and species during the construction, operational and decommissioning phases of the Development is assessed within the Cleve Hill Environmental Statement (ES), Chapter 8 – Ecology. Description of the Development is provided within Chapter 5 of the ES and not repeated herein.

The report is supported by the following two appendices:

- Appendix A – Plant Species List; and
- Appendix B – Figure 1 and 1.1 to 1.10: Phase 1 Habitat Plan and target notes.

A range of surveys and their subsequent report outcomes have been completed for the Site and should be read in conjunction with this report:

- Cleve Farm – Amphibian Survey¹;
- Cleve Farm – Badger Survey²;
- Cleve Farm – Bat Survey Report³;
- Cleve Farm – Breeding Bird Survey Report⁴;
- Cleve Farm – Preliminary Invertebrate Survey Report⁵;
- Cleve Farm – Passage Bird Survey Report⁶;
- Cleve Farm – Extended Phase 1 Survey Report⁷;
- Cleve Farm – Reptile Survey Report⁸; and
- Cleve Farm – Water Vole Survey Report⁹.

1.2 Site Description

The Site is in a coastal location comprising large arable farmland fields, freshwater grazing marsh, flood defences and the existing Cleve Hill Substation in the administrative areas of Swale Borough Council and Kent County Council. The Site is coastal, located 2 km northeast of Faversham and 5 km west of Whitstable on the north Kent coast. Faversham Creek lies just beyond the western Site boundary and The Swale Channel lies just beyond the northern boundary.

The Site comprises of large open arable fields, with an extensive network of ditches, which intersect the fields and are separated from them by strips of boundary grassland. The arable land at the time of survey was cut crop, and recently ploughed or tilled fields.

¹ AECOM (July, 2016), *Cleve Farm – Amphibian Survey*.

² AECOM (July, 2016), *Cleve Farm – Badger Survey*.

³ AECOM (July, 2016), *Cleve Farm – Bat Survey Report*.

⁴ AECOM (July, 2016), *Cleve Farm – Breeding Bird Survey Report*.

⁵ AECOM (July, 2016), *Cleve Farm – Preliminary Invertebrate Survey Report*.

⁶ AECOM (July, 2016), *Cleve Farm – Passage Bird Survey Report*.

⁷ AECOM (July, 2016), *Cleve Farm – Extended Phase 1 Survey Report*.

⁸ AECOM (July, 2016), *Cleve Farm – Reptile Survey Report*.

⁹ AECOM (July, 2016), *Cleve Farm – Water Vole Survey Report*.

Other habitats, recorded in small areas on the Site, included tall ruderal/herb mosaic, scrub, coniferous parkland, scattered trees, defunct hedgerow, amenity grassland and marshy grassland.

A variety of other habitats occur just offsite, but adjacent to the Site boundary such as: extensive reed bed along the northern boundary; houses, hedgerows, and lines of trees along the southern boundary. The Site is bordered by The Swale, which is a Ramsar designated site, a Marine Conservation Zone (MCZ), a Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI), to the north, east and west. The Swale is a wetland of international importance comprising intertidal mudflats, shell-beaches, saltmarshes and extensive grazing marshes.

1.3 Background

A Phase 1 Habitat Survey, which recommended subsequent protected species surveys, was previously undertaken on the Site by AECOM in 2015. The findings of this Phase 1 Habitat Survey and subsequent protected species surveys are subject to separate report outputs¹⁻¹⁰, which also provide information on the relevant survey methodologies employed.

Where relevant to this report, the findings of these reports have been cross referenced.

An updated great crested newt (GCN) assessment and eDNA survey was also completed in April 2018 by Arcus ecologists. A full record of the methods employed and the results is provided within the subsequent report output¹⁰. Where relevant, reference to the findings of this assessment have also been made within this report.

2 METHODS

2.1 Desk Study

A desk study provides existing ecological information which is used to help establish the baseline condition and context of the Site and surrounds.

2.1.1 Environmental Records

Information about statutory designated sites (e.g. Sites of Special Scientific Interest, SSSI) was sought within 5 km and information about non-statutory designated sites (e.g. Local Wildlife Sites, LWS) and legally protected and notable species was sought within an area extending up to 2 km radius from the Site boundary.

Information about statutory designated sites that are designated primarily for their ornithological features, such as Special Protection Areas (SPA) have also been sought from within 5 km of the Site, but are addressed separately to this report.

Existing information about designated sites and records of legally protected and notable habitats and species was sought from various sources, with the following resources and data providers consulted:

- Kent & Medway Biological Records Centre (KMBRC);
- National Biodiversity Network (NBN);
- Kent Bat Group;
- Kent Reptile and Amphibian Group (KRAG);
- Kent Mammal Group;
- Kent Field Club;
- The Bumblebee Conservation Trust;
- Kent Wildlife Trust; and

¹⁰ *Habitat Suitability Index (HSI) Assessment and Environmental DNA Report: Cleve Hill Solar PV Array*. Arcus. May 2018

- Multi-Agency Geographic Information for the Countryside (MAGIC)¹¹.

Searches for species records were limited to legally protected animals considered to be potentially sensitive to the Site, as well as local conservation priorities, and this therefore included:

- Conservation of Habitats and Species Regulations 2017 – Schedule 2 'European Protected Species';
- Wildlife and Countryside Act 1981 (as amended) – Schedule 5 animals¹²;
- Protection of Badgers Act 1992 – Badgers;
- Birds listed in Annex 1 of the EC Birds Directive, Schedule 1 of the Wildlife and Countryside Act, and Red and Amber listed species of conservation concern; and
- Local Biodiversity Action Plan (LBAP) priorities.

2.1.2 Review of Previous Reports

A review of previous survey reports¹⁻⁹ compiled for the Site was undertaken in order to determine previous conditions of the Site and to give context to the Updated Extended Phase 1 Habitat survey in terms of likely protected species and habitats present.

2.2 Extended Phase 1 Habitat Survey

A Phase 1 habitat survey is used to classify and map natural and semi-natural habitats and their constituent plant species. The survey is 'Extended' to include an assessment of the potential of habitats and features within the Site and (where noted) outwith the Site boundary to support protected and notable animal species.

The survey was conducted during a visit on the 15th and 16th February 2018, which was outside the optimal survey period, but in accordance with standard methods¹³. The survey assessed and classified the habitats within the Site and recorded the vascular plants of each habitat type following recognised nomenclature¹⁴; note that only common British names have been used in the text, with full scientific names provided in Appendix A. All habitats were mapped in the field on to large-scale maps (see Appendix B: Figure 1 for an overview, and Figures 1.1 to 1.10).

The abundance of each plant species was estimated throughout using the 'DAFOR' scale: Dominant, Abundant, Frequent, Occasional and Rare.

The survey also sought to assess the ecological value of hedgerows, with reference to the Hedgerow Regulations 1997, and to determine the presence of non-native, invasive species, such as Japanese Knotweed or Himalayan Balsam.

2.3 Ornithological Surveys

Breeding bird surveys were undertaken over three seasons between 2014 and 2016, further information regarding the survey work undertaken for ornithology is detailed in the ES, Chapter 9: Ornithology and is not covered further within this report.

2.4 Survey Limitations

Access to water bodies located within 500 m of the Site boundary, to assess their potential to support breeding GCN, was not possible at the time of survey. Subject to access agreement, recommendations were made to undertake GCN habitat assessments for

¹¹ www.magic.gov.uk

¹² Excludes those species only protected from sale and possession under Schedule 5(a) and 5(b)

¹³ Joint Nature Conservation Committee (2003) *Handbook for Phase 1 habitat survey – a technique for environmental audit*. Peterborough: JNCC.

¹⁴ Botanical Society of Great Britain (BSBI) principally following Kent (1991) and Stace (1997). For simplicity, only the common names of plant species have been used in this report; full scientific names are provided in Appendix 2.

these ponds, with great crested newt surveys of waterbodies subsequently completed on the 23rd and 24th April 2018.

The Extended Phase 1 Habitat survey was conducted outside of the peak botanical flowering season for many plants. However, some plants were still found to be in flower or in early stages of growth, and from dead stems and leaves it was also possible to identify other plant species and hence assess habitats present on Site. Incidental observations of these habitats were made during the great crested newt surveys of the 23rd and 24th April 2018, which confirmed the development of these earlier identified species and habitats.

Notwithstanding the limitations above, this report is therefore considered to provide a robust interpretation of the ecology on the Site.

3 RESULTS

3.1 Desk Study

3.1.1 Environmental Records

3.1.1.1 Designated Sites

Kent Bat Group, Kent Mammal Group, Kent Wildlife Trust, Kent Naturalist Club and The Bumblebee Conservation Trust provide their species records direct to the Kent and Medway Biological Records Centre (KMBRC). KMBRC provided data search records on the 5th February 2018, whilst responses from Kent Reptile and Amphibian Group (KRAG) were received on the 7th February 2018. Non-statutory designated site information was received by Kent Wildlife Trust on 12th March 2018.

There are 12 statutory designated sites for nature conservation within 5 km of the Site, three of those sites are directly adjacent or very close to the boundaries of the Site to the west, north and east, with one of the designated sites holding a multiple designation.

Four non-statutory designated sites for nature conservation were recorded within 5 km of the site boundary, with the nearest being Uplees Lake and Marsh (SW44) Local Wildlife Site (LWS) at 1.2 km to the west northwest. A summary of information on the statutory and non-statutory designated sites can be found in Table 3.1.

Table 3.1 Designated Sites within 5 km of the Study Area.

Site Name	Status	Distance and Direction from Site	Description
Statutory Designated Sites			
The Swale	Ramsar/SSSI/SPA	Adjacent to the north, east and west	Complex of estuarine habitats (mudflats, saltmarsh and grazing marsh) supporting internationally notable assemblages of invertebrates, higher plants, and birds.
South Bank of the Swale	LNR	Adjacent to the north and west	
The Swale Estuary	MCZ	Approximately 10 m to the west, and 70 m to the north	Designated as a Marine Conservation Zone in January 2016, the site is considered to be highly biodiverse and is known to be an important spawning and nursery ground for various fish species. The Swale Estuary consists of important habitats such as sand and sediments.
Oare Marshes	LNR	300 m to the west	Traditional grazing marsh in Kent with reedbed and saltmarsh dissected by freshwater and brackish dykes. Internationally important reserve

Site Name	Status	Distance and Direction from Site	Description
			for migratory, overwintering and breeding wetland birds. The saltmarsh supports a unique set of plants tolerant of the salty conditions including golden samphire, sea lavender, sea purslane, sea clover and thrift. Freshwater dykes contain frogbit, reedmace and water plantain. Common seals are often seen in the Swale Estuary.
The Swale	NNR	1.4 km to the north	Coast and grazing marsh habitats supporting significant populations of waterbirds.
Seasalter Levels	LNR	1.5 km to the east	Part of the North Kent coast freshwater grazing marsh, it is also a valuable wetland site for wintering and migratory wildfowl and wading birds, including wigeon, teal, redshank and lapwing.
Foxes Cross Bottom	LNR	3.5 km to the east	A mosaic of neutral grassland with scrub, native broadleaved woodland and other valuable habitats such as ponds, wet ditches and hedgerows. In the summer many warblers and nightingales nest in the scrub.
Ellenden Wood	SSSI	3.6 km to the east	Coincident with part of the Blean Complex SAC, notified for its ancient woodland habitat supporting diverse flora, invertebrate and breeding bird community.
Blean complex	SAC	3.6 km to the east	Ancient woodland, specifically the Annex 1 habitat: Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli.
Elmley	NNR	4.3 km to the northwest	Wide expanse of grazing marsh, divided by ditches and frequent shallow surface flooding which that home to large numbers of wintering wildfowl and breeding waders.
Blean Woods	NNR	4.4 km to the southeast	Part of the largest ancient woodland in southern Britain, supporting diverse flora, invertebrate and bird populations.
Church Woods, Blean	SSSI	4.4 km to the southeast	Coincident with part of the Blean Complex SAC, notified for its ancient woodland habitat supporting diverse flora, invertebrate and breeding bird community.
Non-Statutory Designated Sites			
SW44 Uplees Lake and Marsh	LWS	1.2 km to the west northwest	Several ponds are surrounded by willow carr, scrub and grassland. The site supports a good bird fauna.
SW48 Abbey Fields, Faversham	LWS	1.2 km to the southwest	Designated as a site of SSSI quality, supporting scrubland bird species and has records of four breeding KRDB3 (Kent Red Data Book) species include nightingale, reed warbler, yellow hammer and house sparrow. The site also supports a high diversity of invertebrates, water voles and reptiles (common lizards, grass snakes and slow worms).
SW24 Graveney	LWS	1.6 km to the southeast	It is designated for its dykes within the grazing marsh. Additional habitats include reed beds, acid grassland, semi-improved grazed pasture and hay

Site Name	Status	Distance and Direction from Site	Description
Dykes and Pasture			meadows. A small orchard is also situated to the south-west and several small plantation woodlands.
SW01 Bysing Wood and Oare Gravel Pits	LWS	2.6 km to the southwest	Bysing Wood is designated for its ancient woodland. A small area of high forest stands to the south-west with mature oak and sweet chestnut. Other habitats include scrub, open water and wetland habitats. Oare Gravel Pits is a former industrial workings and disused gravel pits which now supports a diversity of bird fauna, bats and invertebrates. An old canal runs through the northern part of the site and sycamore woodland and mature ash surrounds the former gunpowder manufacturing site.

3.1.1.2 Species Records

Where multiple records were found for each protected or priority species, the nearest and most recent records have been provided. Avian data search records are excluded from the following table, as these are included within a separate ornithological study and report outputs¹⁵.

Data search records were obtained from KMBRC, and KRAG. The desk study returned 16 species records for national and European protected species within 2 km of the Site boundary, with nine of these species records for bats found within 5 km. Where multiple records were found for each species, the nearest and most recent records are provided. The total number of individuals of protected species was 3,010. Records of protected species are summarised in Table 3.2.

The desk study returned 2,330 records of Natural Environment and Rural Communities (NERC) Act 2006 Species of Principal Importance in England (SPIE), Kent Biodiversity Action Plan (KBAP) and other priority species within 2 km of the Site boundary. The desk study also returned 29 records within 5 km for priority bat species. Records of priority species are summarised in Table 3.3. Where species records are shown in Table 3.2, they are not repeated in Table 3.3.

¹⁵ Cleve Hill Solar Park (2018). ES Chapter 9: Ornithology.

Table 3.2: Summary of European and nationally protected species records within 2 km of the Site (5 km for bat species).

Common Name	Date (most recent)	Distance and Direction from Site	Data source	Total Number of Records (Since 2000)
Great Crested Newt	19/04/2016	2.3 km SW	Kent Reptile and Amphibian Group	144 individuals
Great Crested Newt	21/04/2005	314 m SE		
Common Lizard	10/05/2015	1.1 km WSW	Kent & Medway Biological Records Centre	39 individuals
Common Lizard	15/08/2008	54 m N		
Slow-worm	11/06/2017	2k m WSW	Kent & Medway Biological Records Centre	42 individuals
Slow-worm	02/09/2015	685 m SES	Kent Reptile and Amphibian Group	50 individuals
Grass Snake	28/08/2015	2.6 km WSW	Kent & Medway Biological Records Centre	28 individuals
Grass Snake	08/05/2008	624 m WSW		
Adder	04/2015	1.2 km SE	Kent & Medway Biological Records Centre	4 records
Eurasian Badger	17/02/2017	1.8 km W	Kent & Medway Biological Records Centre	6 records
Eurasian Badger	19/03/2007	2 km S		
Water Vole	11/04/2016	1.9 km WNW	Kent & Medway Biological Records Centre	2,114 individuals
Water Vole	29/05/2015	569 m SW		
Common Pipistrelle	25/08/1998	439 m ESE	Kent & Medway Biological Records Centre	116 non-roost records 8 roost records
Common Pipistrelle	26/09/2015	2.1 km WSW		
Soprano Pipistrelle	04/08/2015	753 m SE	Kent & Medway Biological Records Centre	128 non-roost records 52 roost records
Soprano Pipistrelle	01/08/2014	2.2 km WSW		
Nathusius' Pipistrelle Bat	15/09/2006	995 m SW	Kent & Medway Biological Records Centre	28 non-roost records 1 roost record
Nathusius' Pipistrelle Bat	30/09/2017	2.2 km WSW		
Daubenton's Bat	30/09/2017	2.2 WSW	Kent & Medway Biological Records Centre	70 non-roost records 1 roost record
Daubenton's Bat	25/08/1998	395 m ESE		
Serotine Bat	08/08/1998	395 m ESE	Kent & Medway Biological Records Centre	16 non-roost records
Serotine Bat	06/08/2015	1.5 km ENE		
Brown Long-eared Bat	04/08/2015	872 m SSE	Kent & Medway Biological Records Centre	6 non-roost records 14 roost records
Noctule Bat	12/06/1998	728 m SE		
Noctule Bat	06/08/2015	1.4 km ENE	Kent & Medway Biological Records Centre	27 non-roost records 2 roost records
Natterer's Bat	24/02/2015	1.9 km WSW		
Natterer's Bat	05/08/2016	2.2 km WSW	Kent & Medway Biological Records Centre	1 non-roost record 4 roost records
Whiskered Bat	26/09/2015	2 km WSW		
Whiskered Bat	21/09/2014	2.3 km WSW	Kent & Medway Biological Records Centre	2 non-roost records
Least Leftuce	06/08/2011	208 m ENE	Kent & Medway Biological Records Centre	1 Individual

Table 3.3: Summary of priority species records within 2 km of the Site

Species	Date (most recent)	Distance and Direction from Development	Data source	Total Number of Records (Since 2000)
West European Hedgehog	04/09/2016	3.29 km WSW	Kent & Medway Biological Records Centre	20
West European Hedgehog	17/02/2007	1.1 km SE		
Brown Hare	08/06/2007	Within the Site boundary	Kent & Medway Biological Records Centre	11
Common Toad	12/09/2012	2.5 km WSW	Kent & Medway Biological Records Centre	4
Common Toad	19/05/2005	Within the Site boundary	Kent Reptile and Amphibian Group	2

3.1.1.3 Priority and Local Biodiversity Action Plan Habitats

The desk study returned 21 records of Natural Environment and Rural Communities (NERC) Act 2006 Habitats of Principal Importance in England (HPIE), Kent Biodiversity Action Plan (KBAP) and other priority habitats within 2 km of the Site boundary, which included Ancient Woodland, and Traditional Orchard. None of these habitats are represented within the Site. The Standing Open Water KBAP however was identified within the Site.

3.1.2 Review of Previous Reports

3.1.2.1 Amphibians

In March 2015 the Habitat Suitability Index (HSI) was calculated for seven waterbodies within 500 metres (m) of the Site, as well as for the drainage ditches on the Site. Although there were two other waterbodies within 500 m of the Site, access was not granted for these. Four ponds within 500 m of the Site, as well as the network of drainage ditches on the Site, were considered suitable for great crested newt (GCN).

Following the HSI assessments, surveys were undertaken (April and June 2015) to determine population size class on the waterbodies and drainage ditches considered suitable for GCN. GCN were observed within three waterbodies outside of the Site boundary, with only small populations recorded¹⁶.

Marsh frog, an invasive non-native species under Schedule 9 of the Wildlife and Countryside Act, was recorded in the drainage ditches on Site. It is illegal for them to be released into the wild.

3.1.2.2 Badger

Two badger surveys were undertaken in May 2014, with no setts observed within the Site, or visible adjacent to the Site boundary. Furthermore, no signs of badger, such as runs were observed during the surveys or when the Site was re-checked during the Phase 1 Habitat Survey undertaken in 2015.

¹⁶ English Nature (2001) *Great crested newt mitigation guidelines*. Peterborough: English Nature.

3.1.2.3 Bats

The Site was identified to be of low quality habitat¹⁷ and three bat activity survey visits were undertaken between June and September 2015. The results of the surveys concluded that the Site offers foraging and commuting habitat used by at least nine species of bat, with common and soprano pipistrelle (*Pipistrellus pipistrellus* and *P. pygmaeus*) found in high numbers. Key areas utilised for foraging and commuting within the Site comprised the ditch network, the sea wall zone and cattle grazed pastures adjacent to the north of the Site, and along the tree lines adjacent to the south of the Site. No habitat suitable to support roosting bats was recorded within the Site.

3.1.2.4 Invertebrates

The Site was visited on three occasions in August and September 2015 in order to collect samples of invertebrates. A total of 172 invertebrate species was found during the survey, which was considered to be a relatively low number for a Site of this size. This was attributed to the predominance of intensively farmed habitats found on the Site. No endangered invertebrates were recorded on the Site, with one nationally rare species (a large grey horsefly) and ten nationally scarce species recorded.

3.1.2.5 Reptiles

Surveys were conducted in September and October 2015. The survey visits identified that the Site supports two species of widespread reptile, with a good population¹⁸ of common lizard and a low population of grass snake.

3.1.2.6 Water Vole

Surveys were undertaken in September 2015 and covered 22 ditches within the Site boundary. Generally, current water vole activity was found to be abundant and widespread across the Site within suitable habitat. Of these ditches, water vole activity was recorded from 10 ditches.

3.2 Habitats: - On the Site

3.2.1 Overview

The Site was mostly composed of bare ground, with cut crop, tilled or ploughed fields present, and hardstanding, with farm tracks and roads found on the Site. Other habitat areas identified during the survey were features associated with the field boundaries, such as: semi-improved neutral grassland, wet ditches with marsh, running or standing water present.

Other habitats, recorded in small areas on the Site, included tall ruderal/herb mosaic, scrub, coniferous parkland, scattered trees, defunct hedgerow, amenity grassland and marshy grassland.

No non-native invasive species were recorded within terrestrial habitats on the Site or in those areas just beyond at the time of the survey. Least duckweed, which is an invasive species was identified within the aquatic habitats on the Site.

3.2.2 Cultivated/disturbed land, bare ground and hardstanding

The majority of the Site was composed of cut crop, and recently ploughed or tilled fields. Whilst areas of hardstanding included open storage areas, field and access tracks.

¹⁷ Hundt, L. (2012). *Bat Surveys – Good Practice Guidelines*. London: Bat Conservation Trust – valid at time of survey.

¹⁸ Froglife (1999). *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*; Froglife Advice Sheet 10. Froglife, Halesworth.

3.2.3 Marsh, running and standing water

There were wet ditches, which comprised of either running water or standing water, found throughout the Site. It appeared that some of the standing water was likely to be draining very slowly, and this was dominated by common reed and duckweed. The invasive least duckweed was found in places, which covered the entire surface of some ditches. In the visibly flowing water ditches, blanket weed and fools watercress was observed. Whilst a better quality ditch to the west half of the Site (centred on grid reference TR03806342) contained common reed, reedmace, pendulous sedge, brooklime, fools watercress, hornwort and starwort. In wider, more open ditch habitats and particularly to the north, gut weed was identified, which is a species that is typically found in brackish water conditions.

3.2.4 Semi-improved neutral grassland

Much of the field boundaries throughout the Site comprised of semi-improved neutral grassland. Grass species typical of semi-improved neutral grassland, such as Yorkshire fog and cocksfoot were found in this habitat, along with creeping buttercup, creeping thistle and spear thistle. Occasionally dovesfoot cranesbill was identified in the sward.

3.2.5 Dense Scrub

There were two areas of scrub within the Site. In the southeast of the Site, an old boundary ditch feature and associated overgrown hedgerow with trees was bordered by an area of bramble scrub, which formed an ecotone with field boundary grassland. Bramble scrub was also found adjacent to a running water ditch on the south west boundary.

3.2.6 Tall ruderal/herb mosaic

A tall ruderal/herb mosaic habitat was found close to the southern boundary of the Site, which was dominated by rosebay willow herb, wild carrot, and nettle.

3.2.7 Species poor defunct hedgerow

Almost all of the species poor hedgerows recorded within the study area had been planted or regularly managed in recent decades. The hedgerows were not very diverse, and appeared to be dominated by either hawthorn or blackthorn, with occasional elder or holly present. Ground flora was also poor, with cocksfoot, Yorkshire fog and creeping thistle frequently present.

3.2.8 Marshy grassland

An area of marshy grassland was recorded within the southeast of the Site. This area was wet with pools of water present during the survey. The sward was dominated by hard and soft rush, with tussocky grassland and rushes also recorded in this area. Field vole holes were recorded in the drier sections of this grassland.

3.3 Habitats: - Beyond the Site

A variety of habitats occur adjacent to the Site boundary such as extensive reed bed along the northern boundary, with houses, hedgerows, and lines of trees along the southern boundary. Amenity grassland was found close to the sea wall top and along a footpath to the west, and another field next to farm buildings to the southeast of the Site. White clover and rye grass dominated this habitat, which due to footfall from walkers appeared as a very short sward.

The Site is bordered by The Swale, Ramsar site, MCZ, SPA and SSSI, to the north, east and west. The Swale is a wetland of international importance comprising intertidal

mudflats, shell-beaches, saltmarshes and extensive grazing marshes. Further details are found in Table 4.1.

3.4 Protected Species

3.4.1 Great Crested Newt and Amphibians

The Site's ditch habitats were identified during the Extended Phase 1 Habitat survey as being suitable for amphibians, such as common frog and toad. However, the presence of running water within the ditches and extensive duckweed coverage in some ditches were unsuitable for great crested newts. Access to other waterbodies within 500 m of the Site boundary were not available at the time of the Extended Phase 1 Habitat survey, and a GCN Habitat Suitability Index (HSI) assessment¹⁹ of these waterbodies was not completed. There are records of GCN and common toad returned from the data search, with the nearest common toad record found on the Site and the nearest GCN record found at 314 m to the southeast.

3.4.1.1 Further assessment

To update the earlier AECOM HSI assessment and GCN surveys, it was identified that the surveys of these and any other waterbodies within 500 m of the Site needed to be repeated. Following the arrangement of access, a great crested newt survey could be completed on the 23rd and 24th April 2018 of each of these waterbodies, with full details of the HSI assessment and eDNA survey methods, results and recommendations detailed within a separate report⁸. In summary, GCN were detected in four of the ten waterbodies surveyed, of which the closest waterbody where they were confirmed present found within the site boundary and just to the west of the existing London Array substation.

3.4.2 Reptiles

Habitats with potential to support foraging and sheltering reptiles, such as the ditch network and rough semi-improved neutral grassland were present throughout the Site. The wet grassland and ditches provide good habitat for foraging grass snake, whilst scrub patches and stone piles offered opportunities for hibernating or sheltering reptiles (TNS 17-20). Embanked habitat facing east and west on the Site, also offered ideal habitat for basking reptiles.

Records for slow worm, common lizard, grass snake and adder was returned from the desk study within 2 km of the Site, with the nearest records of common lizard found adjacent to the Site.

At the time of the present Extended Phase 1 Habitat survey, an active common lizard was found foraging within field boundary habitat adjacent to a site access track in the west half of the Site.

3.4.3 Badger

No badgers, latrines or snuffle holes were recorded on the Site or within 30 m, and no evidence of burrowing badgers found on the Site at the time of the present Phase 1 Habitat survey. The open nature of the Site may deter badgers from sett establishment and connectivity within the Site is poor due to the drainage network. However, the expanse of arable land surrounding the Site provides excellent foraging potential and it therefore likely that badgers will be found foraging or sheltering within the near landscape.

¹⁹ ARG UK (2010). *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index*. Amphibian and Reptile Groups of the United Kingdom.

The desk study returned records of badger within 2 km of the Site, with the nearest record found at 1.8 km to the west in 2017.

3.4.4 Bats

The Phase 1 Habitat survey identified several mature trees to the south boundary of the Site that had the potential to support roosting or hibernating bats (TNs1-8). Fissures, rot holes, wood pecker holes were found in pollarded poplar and other mature trees, which offered bat roost potential along the south boundary of the Site. The wet ditch systems on the Site, along with adjacent riparian and semi-improved neutral grassland field boundary habitats offered habitat for invertebrate species, which are foraged upon by bats. The majority of the Site comprised of arable fields, which offered a negligible value to foraging bats.

The Site is open and largely unlit by security lighting, providing dark corridors and areas within the Site to benefit all species of foraging and commuting bats, including those likely to be more sensitive to lighting. An intact Second World War era pillbox emplacement was found on the Site, which was identified as having the potential to be converted for roosting bats as an enhancement (TN13).

The desk study also returned 82 roost records within 5 km for protected bat species, which included: brown long-eared bat; noctule bat; common pipistrelle; soprano pipistrelle; Nathusius' pipistrelle; serotine bat; Daubenton's bat; whiskered bat; and Natterer's bat. Records dating to as recently as 2017 were returned, with a Nathusius' pipistrelle recorded as close as 395 m to the east south east.

3.4.5 Otter

No evidence of otter was recorded in any of the ditches on the Site during the Phase 1 Habitat Survey. The habitats were considered suitable to support foraging or resting otter on the Site, with the potential for otter to use the running water ditches that run through the Site for commuting. The desk study returned no records of otter within 2 km of the Site; however, anecdotally their presence has been reported in the wider area.

3.4.6 Water Vole

During the current Phase 1 Habitat survey, evidence of water vole was recorded at the time of the survey despite being outside of the water vole active period. Running water and standing water throughout the Site provides potential for water vole, with these habitats of sufficient size and connectivity to have the potential to support good populations of water vole. Habitat connectivity suitable for water vole is likely to extend beyond the Site boundaries to areas within the wider landscape.

The desk study search returned multiple records of water vole within 2 km of the study area, with the nearest record of water voles identified at 569 m to the southwest of the site boundary in 2015.

3.4.7 Birds

The habitats within the Site had potential to support nesting, overwintering and foraging birds within the open farmland. Results of the ornithological surveys completed on Site can be seen in ES Chapter 9: *Ornithology* and are not repeated herein.

3.4.8 Invertebrates

The Updated Extended Phase 1 Habitat survey identified the Site as containing grassland field margins, running water, standing water, and other smaller habitat types, which all offered suitable habitat for a likely range of widespread and commonly occurring terrestrial and aquatic invertebrate species. Much of the Site contained agricultural

monocrop fields and bareground, which offered limited value to invertebrates. No specific protected or priority invertebrate species within 2 km of the Site were identified in the desk study returns.

3.4.9 Other Species

Brown hares were observed during the survey within fields in the northern half of the Site, with evidence of rabbit also recorded. Previous desk study records show brown hare have been recorded on the Site, and are likely to be present at reasonable densities within the Site and wider landscape.

4 TEMPORAL COMPARISON AND CONCLUSION

This section comprises a comparison between the Extended Phase 1 Habitat Survey carried out in 2015 and the updated survey carried out in 2018 and reported above.

4.1 Habitats

The habitats found in 2015 and 2018 within the site were found to be broadly similar, with slight variations in habitat adjacent to the ditch network. These were due to parameters such as: seasonal variation in plant growth and structure; the cutting of field margin habitat; and dredging of ditch network channels.

The 2015 survey was completed in early August, whereas the 2018 survey was completed in February, with the latter completed at a time year before tall ruderal habitats will have developed during the year. During the 2018 survey, end of season cutting was evident from the previous autumn/winter, the species dominating in marginal habitat were therefore identified as the early grasses, with early season evidence of tall ruderal (wild carrot, hogweed, cow parsley) early growth evident. Dredging of channels was also evident, which also modified the appearance of habitats adjacent to the ditch network. An incidental observation of these habitats during the eDNA great crested newt surveys on the 23rd and 24th April 2018, observed the intermediary development of these habitats

It is expected that these temporal differences between Phase 1 Habitat surveys are influenced by dynamic factors, including both seasonal growth and regular site management cycles, and therefore, the habitats are expected to be broadly similar when considered together on a yearlong basis.

4.2 Species

It was noted during the 2018 Phase 1 Habitat survey, that a common lizard was observed in suitable habitats on the Site, whilst the earlier 2015/16 Phase 1 Habitat survey and reptile survey found both suitable habitats to be present to support this species and confirmation of its presence within that habitat. During the earlier water vole surveys, water voles were recorded in suitable habitat throughout the Site, whilst the Phase 1 Habitat survey in 2018 confirmed that water voles were active on the Site. The presence of these species still remaining on the Site had been confirmed and, in the absence of any other contrary evidence, it is also not possible to exclude the likelihood of other protected species from remaining present on the Site.

Furthermore, with no change in habitat coverage over this temporal period other than that expected dynamically throughout the year and with regular habitat management, it is unlikely that the site will offer either greater or lesser opportunities for protected and priority species, and therefore a similar assemblage of species is expected to be found within these habitats to those observed in 2015.

5 CONCLUSION

On the basis above, it can be argued that the update of further protected species surveys would be likely to obtain results consistent with former surveys, in the absence of any known changes in Site parameters, such as: habitat distribution, structure and management and therefore the surveys from 2015 and 2016 remain valid for the purposes of planning submissions.

APPENDIX A

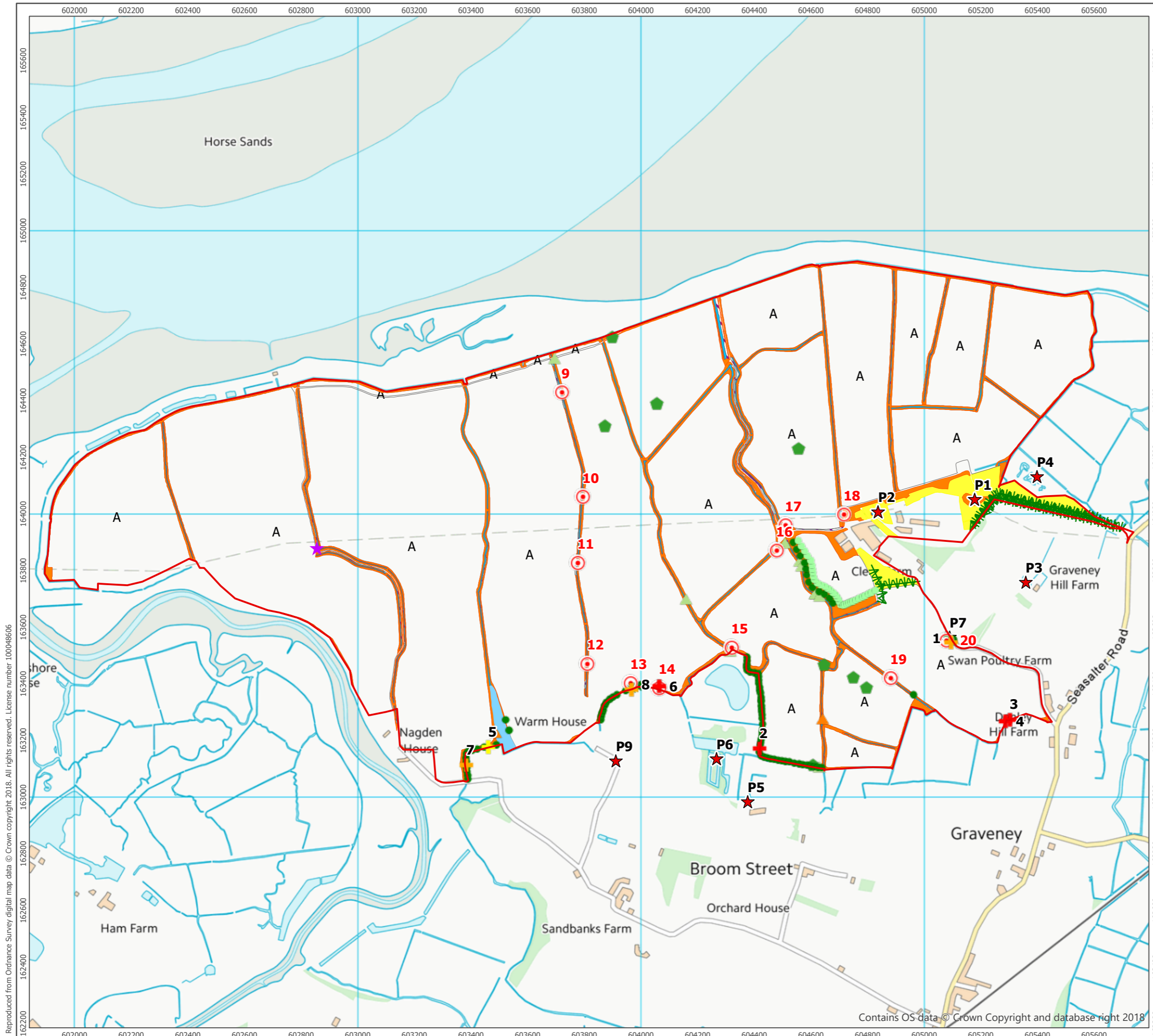
Plant Species List

Common Name	Scientific Name
Blackthorn	<i>Sambucus nigra</i>
Blanket weed	<i>Spirogyra adnate</i>
Bramble	<i>Rubus fruticosus</i> agg.
Brooklime	<i>Veronica beccabunga</i>
Cocksfoot	<i>Dactylis glomerata</i>
Common nettle	<i>Urtica dioica</i>
Common reed	<i>Phragmites australis</i>
Creeping buttercup	<i>Ranunculus repens</i>
Creeping thistle	<i>Cirsium arvense</i>
Dove's foot crane's bill	<i>Geranium molle</i>
Duckweed	<i>Lemna sp.</i>
Least Duckweed	<i>Lemna minuta</i>
Elder	<i>Sambucus nigra</i>
Fool's watercress	<i>Apium nodiflorum</i>
Hard rush	<i>Juncus inflexus</i>
Hawthorn	<i>Crataegus sp.</i>
Herb Robert	<i>Geranium robertianum</i>
Holly	<i>Ilex aquifolium</i>
Hornwort	<i>Ceratophyllum demersum</i>
Lesser celandine	<i>Ficaria verna</i>
Lords and Ladies	<i>Arum maculatum</i>
Pendulous sedge	<i>Carex pendula</i>
Perennial rye-grass	<i>Lolium perenne</i>
Reedmace	<i>Typha sp</i>
Rosebay willowherb	<i>Chamerion angustifolium</i>
Soft rush	<i>Juncus effusus</i>
Starwort	<i>Callitriche sp</i>
White clover	<i>Trifolium repens</i>
Wild carrot	<i>Daucus carota</i>
Yorkshire fog	<i>Holcus lanatus</i>
Bramble	<i>Rubus fruticosus</i> agg.

APPENDIX B
FIGURE 1, AND 1.1 TO 1.10: PHASE 1 HABITAT PLAN AND TARGET NOTES

Phase 1 Target Notes

Target Note	Observation
TN1	Tree Bat Roost potential – moderate
TN2	Tree Bat Roost potential – high
TN3	Oak Tree Bat Roost potential – high
TN4	Oak Tree Bat Roost potential – high
TN5	Tree Bat Roost potential – low
TN6	Tree Bat Roost potential – high
TN7	Tree Bat Roost potential – moderate
TN8	Tree Bat Roost potential – moderate
TN9	Mammal burrow
TN10	Mammal print
TN11	Mammal track
TN12	Mammal print
TN13	WWII Pillbox – dense covering of ivy
TN14	Burrow at the base of the tree
TN15	Mammal track
TN16	Mammal print
TN17	Embankment/ brash pile – suitable for reptiles?
TN18	Stone pile
TN19	Log pile
TN20	Well & Stone pile



- Ecology Core Study Area
- Cultivated/disturbed land - amenity grassland
- A Cultivated/disturbed land - arable
- Marsh/marshy grassland
- Neutral grassland - semi-improved
- Running water
- Standing water
- Swamp
- Hedge with trees - native species-rich
- Broadleaved parkland/scattered trees
- Coniferous parkland/scattered trees
- X Scrub - scattered
- ⊙ Target Note
- ⬠ Bird Sightings
- ▲ Water Vole Signs
- ★ Common Lizard Found
- ▲ Invasive Species: Lemna minor
- ★ GCN HSI
- Bat Roost Assessment**
- + Low
- + Moderate
- + High

1:13,000 Scale @ A3

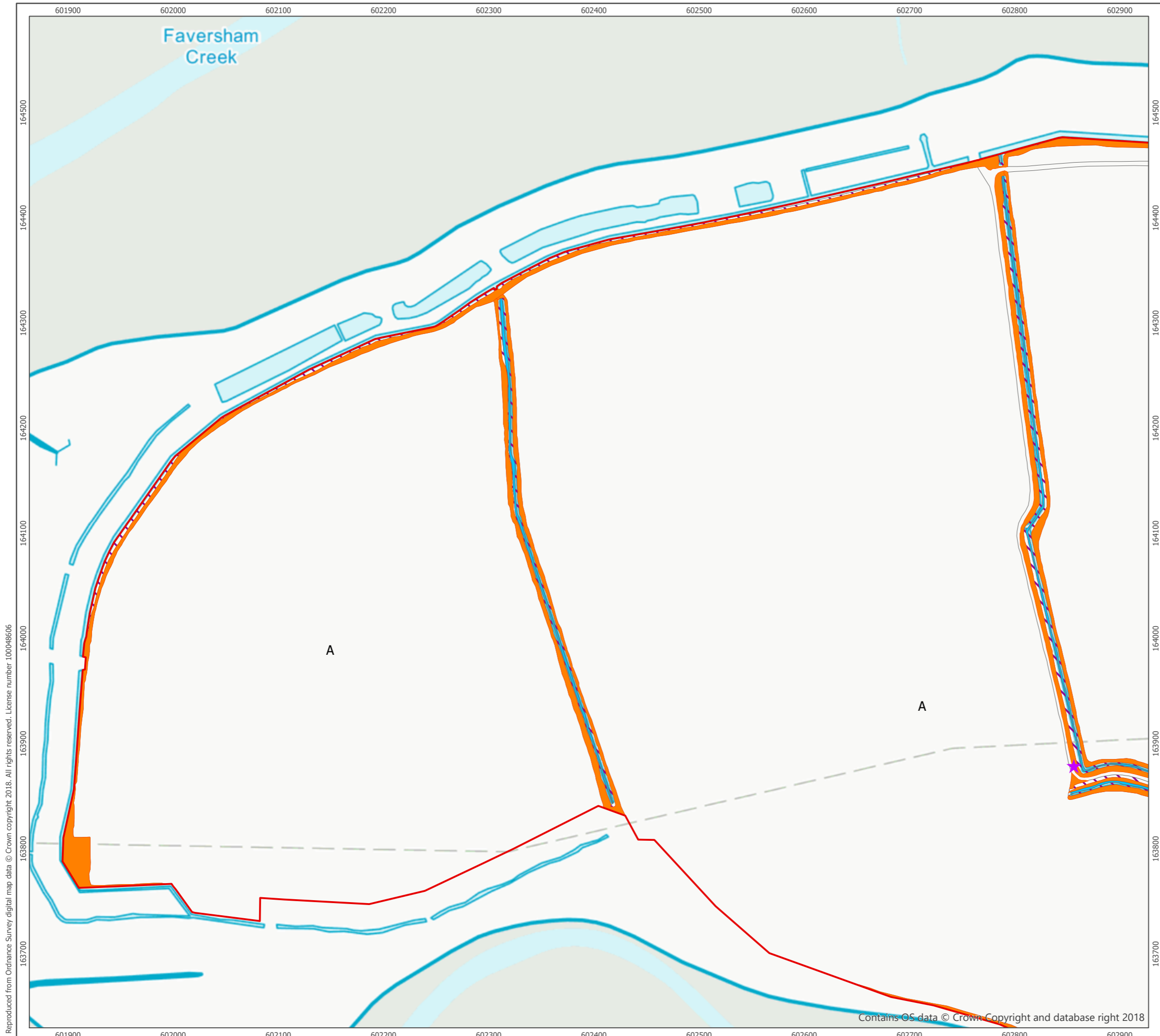
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Checked By: SC	Date: 06/11/2018

Phase 1 Survey Area and Habitat Areas (2018)
Figure 1

**Cleve Hill Solar Park
Updated Phase 1 Habitat
Survey Report**

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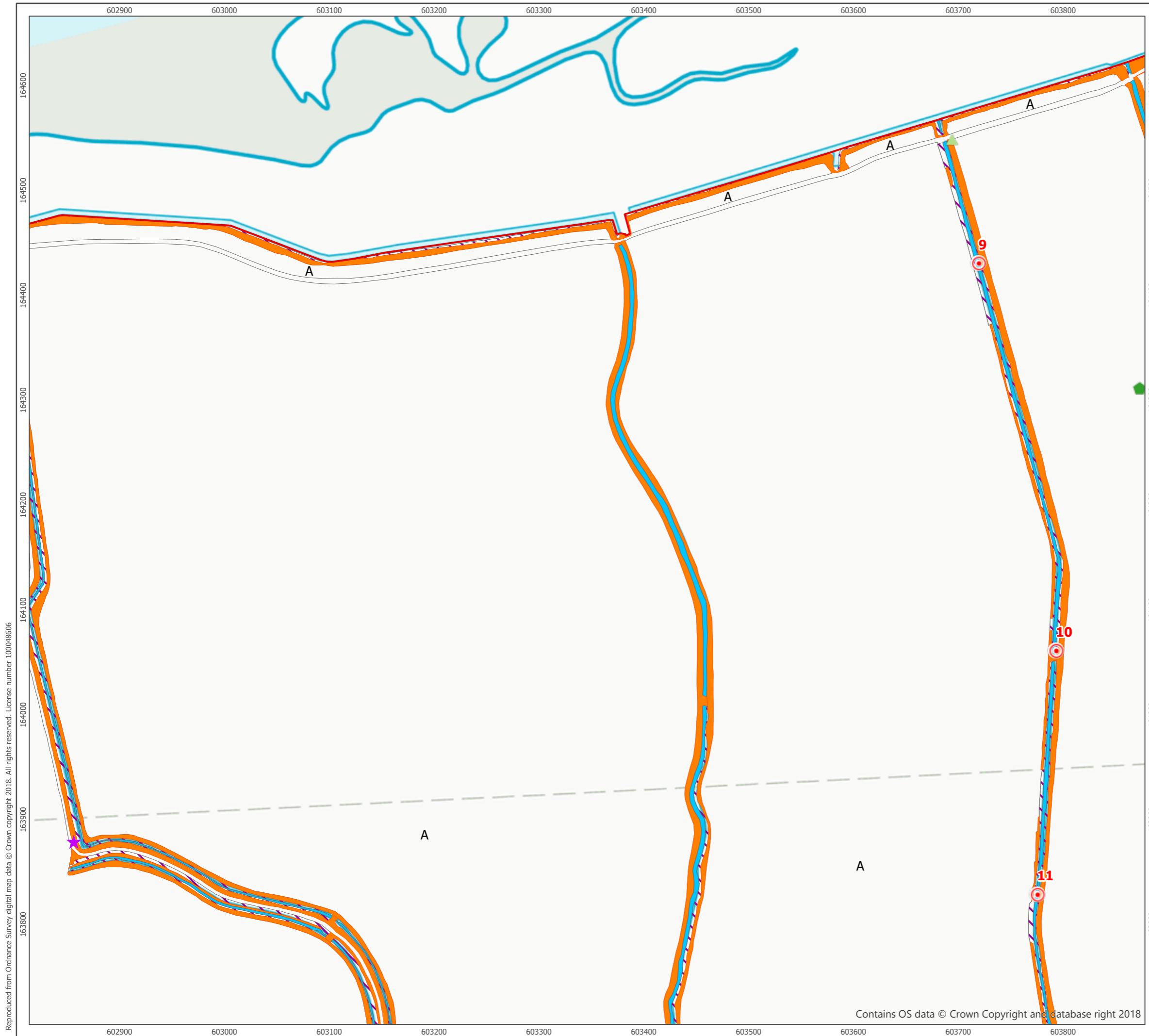
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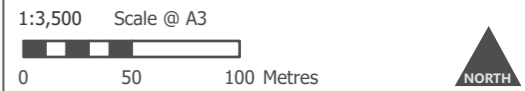
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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.1

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- Running water
- Target Note
- ▬ Bird Sightings
- ▴ Water Vole Signs
- ★ Common Lizard Found



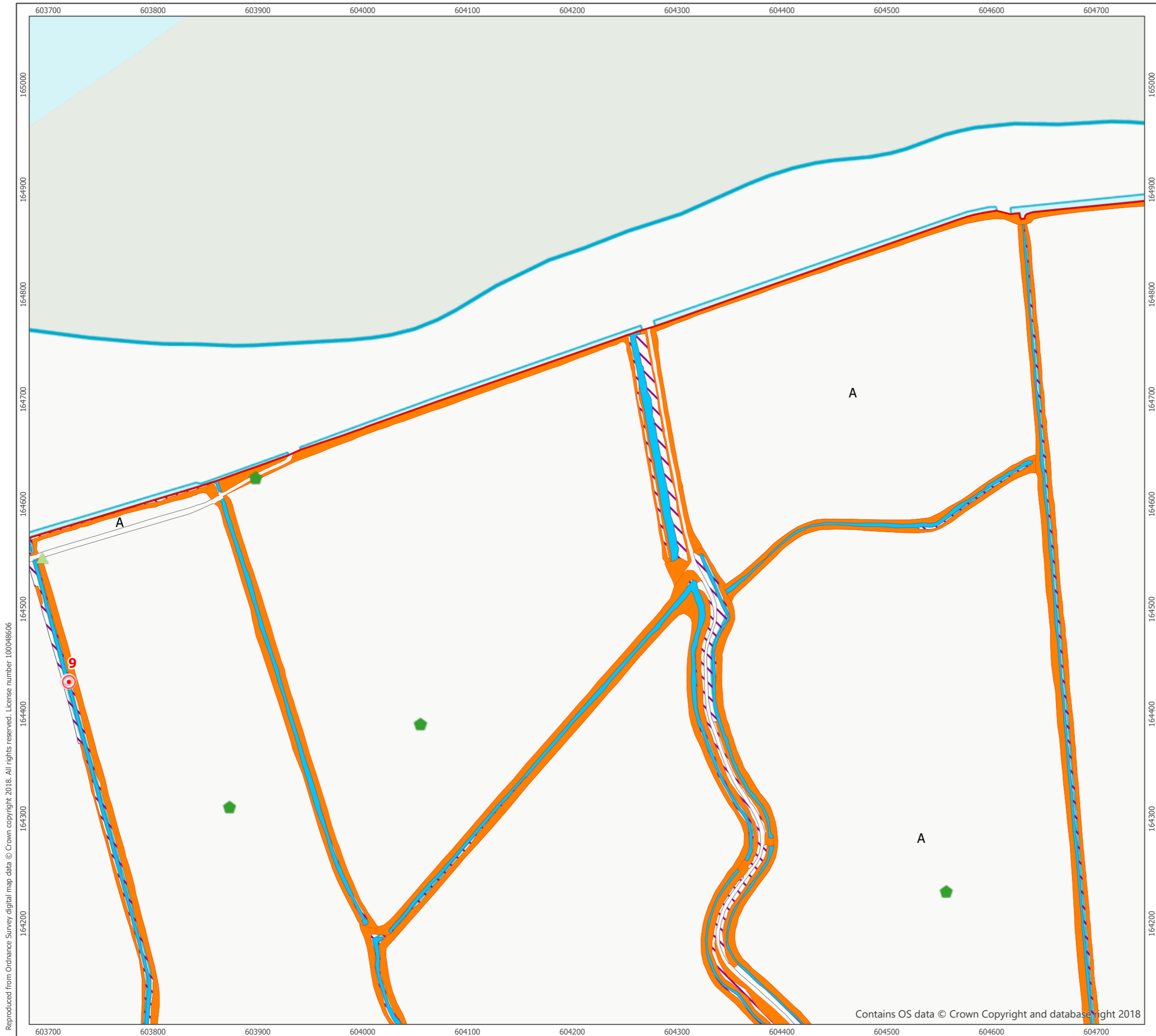
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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.2

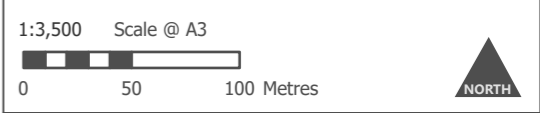
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- Ecology Core Study Area
- A Cultivated/disturbed land - arable
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- Neutral grassland - semi-improved
- Running water
- 9 Target Note
- ▣ Bird Sightings
- ▴ Water Vole Signs



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Phase 1 Survey Area and Habitat Areas (2018)
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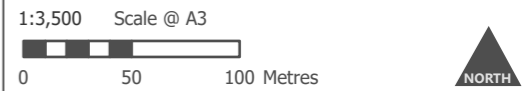
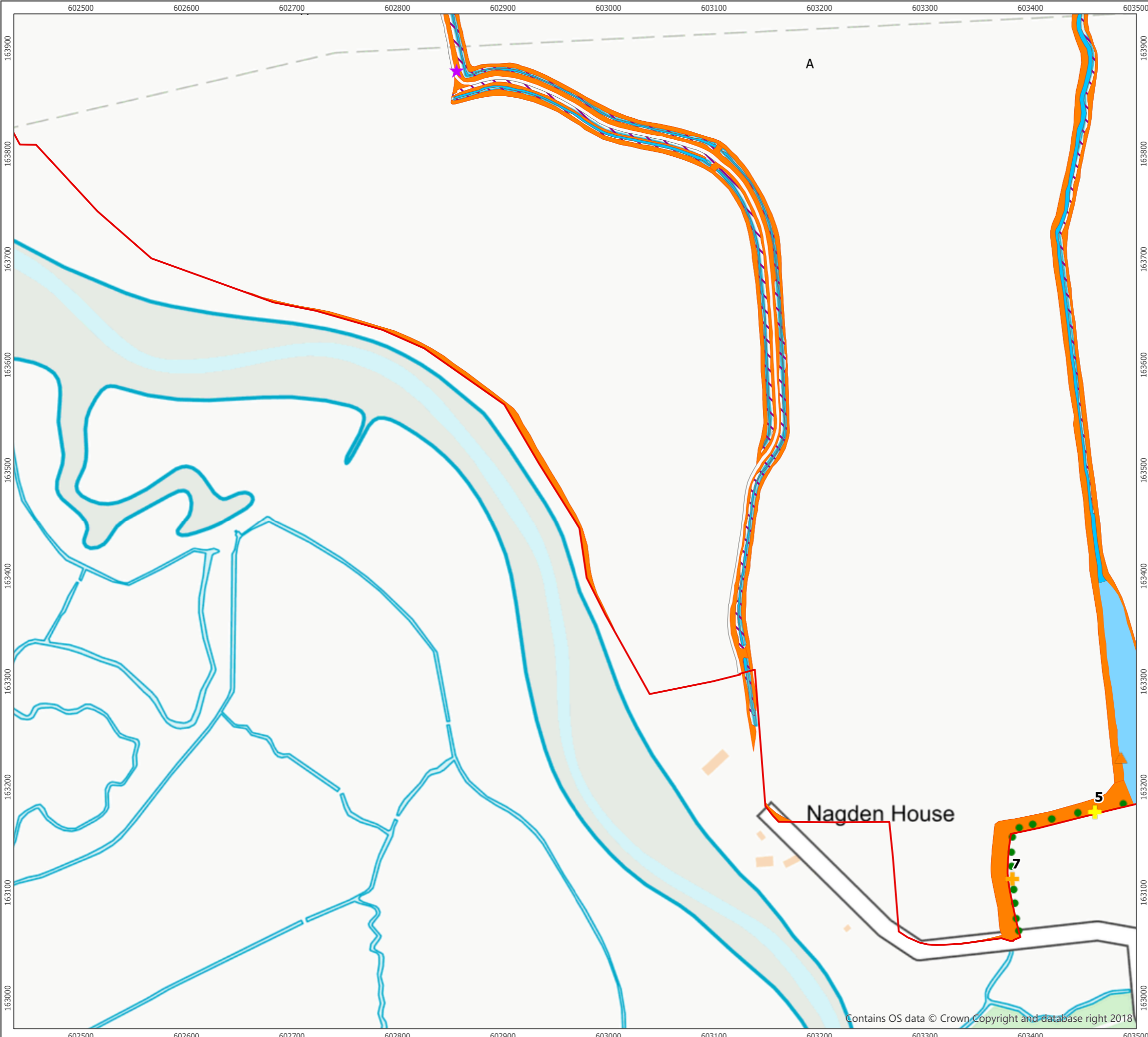
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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.4

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- Ecology Core Study Area
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- Running water
- Swamp
- Broadleaved parkland/scattered trees
- ★ Common Lizard Found
- ▲ Invasive Species: Lemna minor
- Bat Roost Assessment**
- + Low
- + Moderate



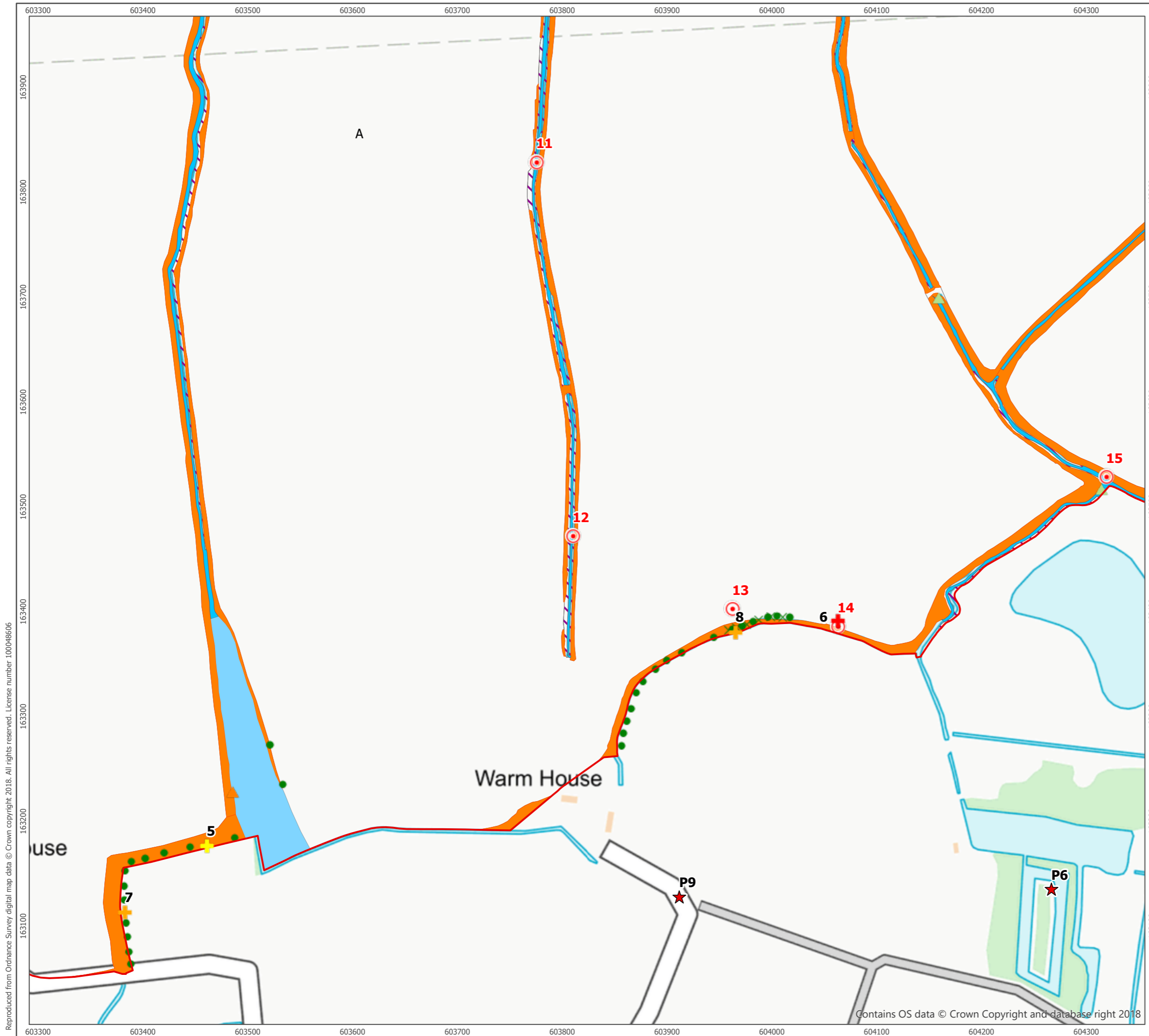
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Phase 1 Survey Area and Habitat Areas (2018)
 Figure 1.5

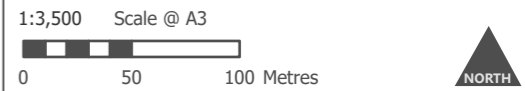
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- Running water
- Swamp
- Broadleaved parkland/scattered trees
- × Scrub - scattered
- ⊙ Target Note
- ▲ Water Vole Signs
- ★ GCN HSI
- ▲ Invasive Species: Lemna minor
- Bat Roost Assessment**
- + High
- + Moderate
- + Low



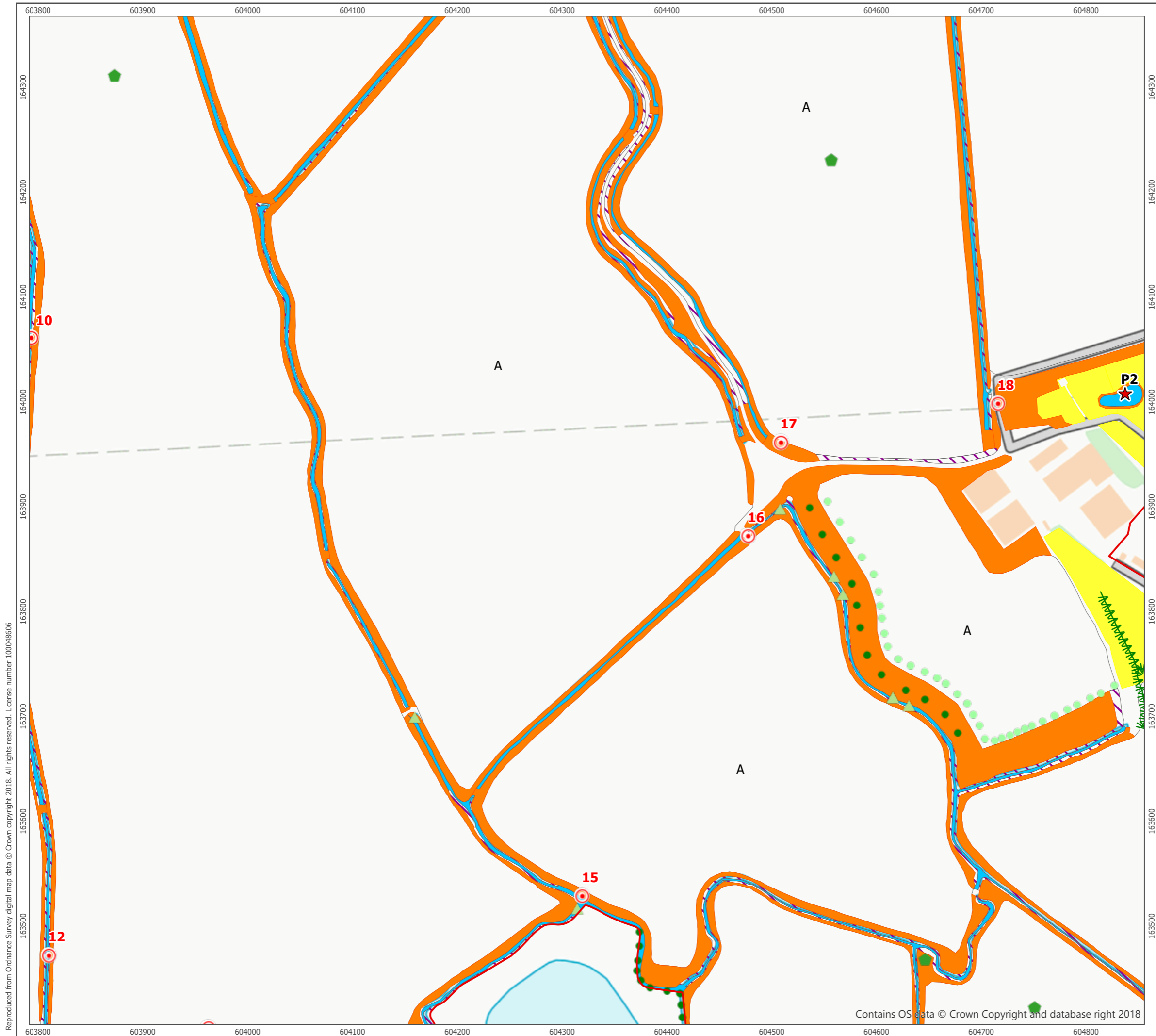
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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.6

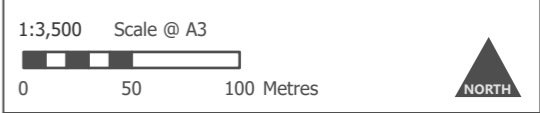
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- Neutral grassland - semi-improved
- Running water
- Standing water
- Hedge with trees - native species-rich
- Broadleaved parkland/scattered trees
- Coniferous parkland/scattered trees
- 0 Target Note
- ⬠ Bird Sightings
- ▲ Water Vole Signs
- ★ GCN HSI



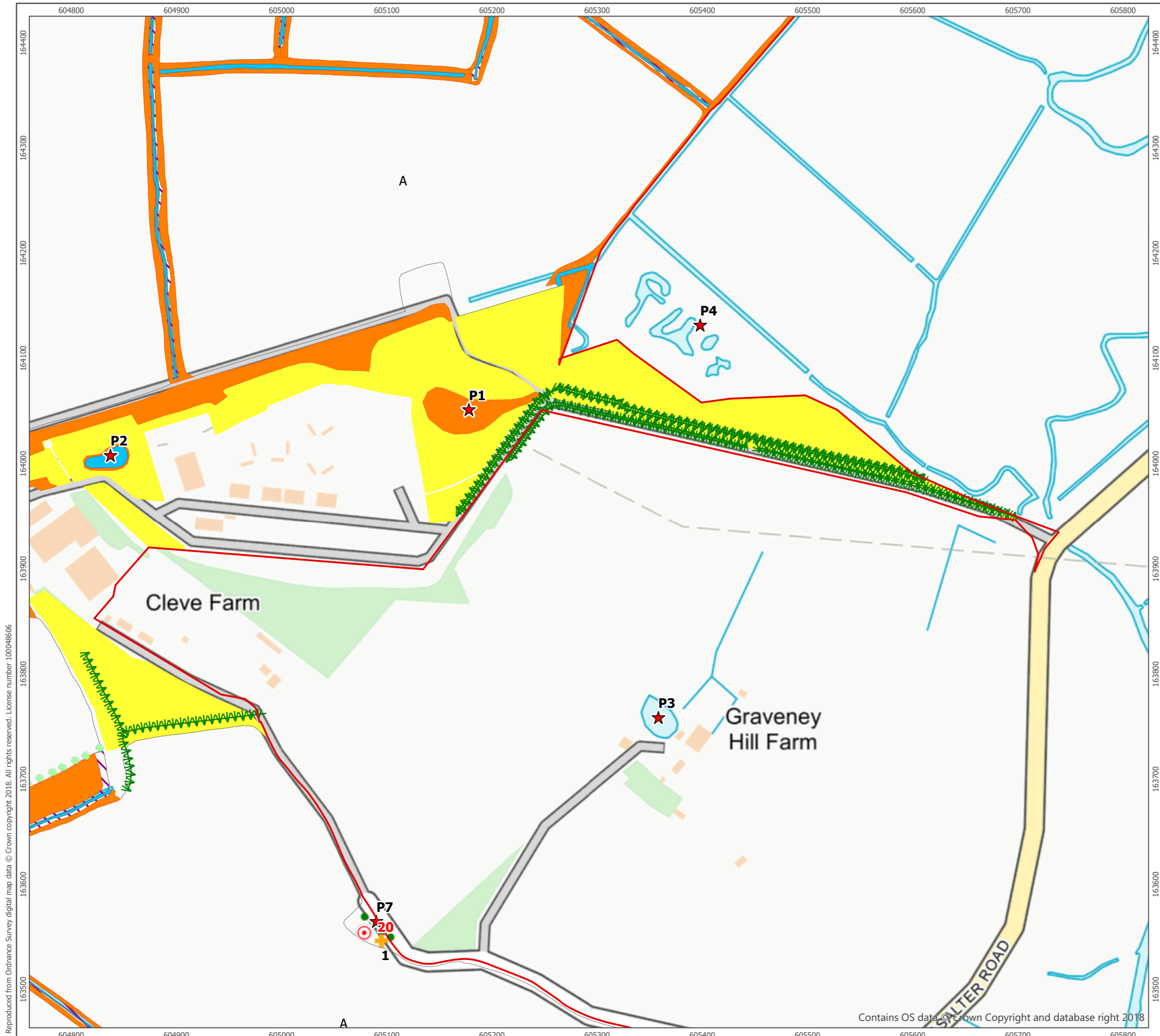
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Phase 1 Survey Area and Habitat Areas (2018)
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- Standing water
- ~~~~~ Hedge with trees - native species-rich
- Broadleaved parkland/scattered trees
- Coniferous parkland/scattered trees
- Target Note
- ★ GCN HSI
- Bat Roost Assessment**
- + Moderate

1:3,500 Scale @ A3

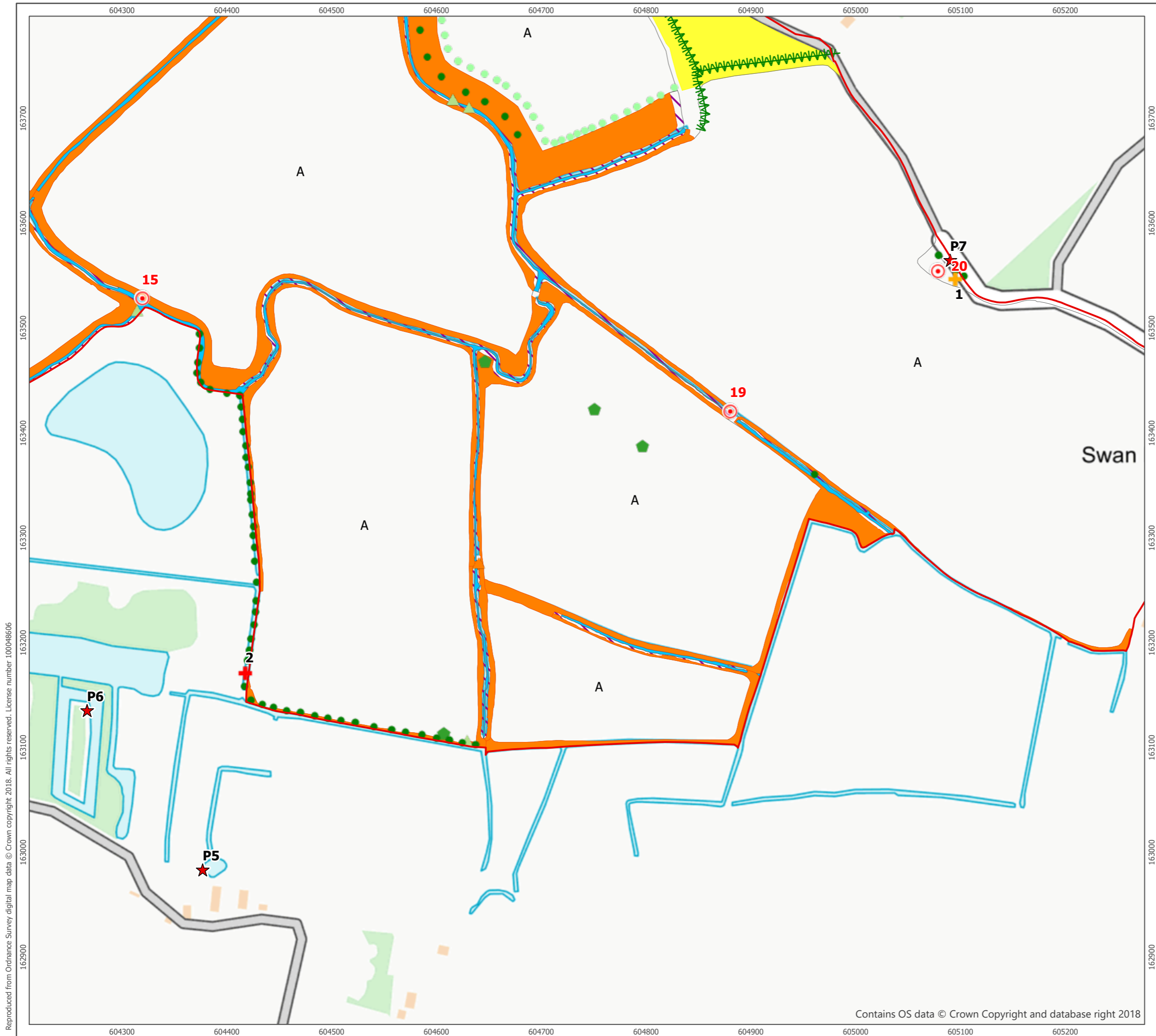
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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.8

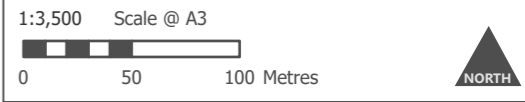
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- Coniferous parkland/scattered trees
- 15 Target Note
- ◆ Bird Sightings
- ▲ Water Vole Signs
- ★ GCN HSI
- ▲ Invasive Species: Lemna minor
- Bat Roost Assessment**
- + High
- + Moderate



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Phase 1 Survey Area and Habitat Areas (2018)
Figure 1.9

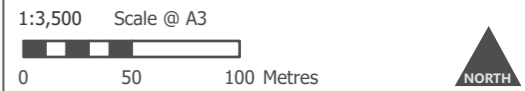
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Phase 1 Survey Area and Habitat Areas (2018)
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