North Benfleet Ecological Constraints Report

Client name	Discipline	Project name	Date
Locality	Ecology	North Benfleet NDO	November 2023
Project number	**Prepared by**	**Checked by**	**Verified by**
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Revision History

Revision	Revision date	Details	Authorised	Name	Position
V1	21.11.2023	Draft	JF	JF	Associate Director
V2	21.12.2023	Final	JF	JF	Associate Director

1. Introduction

1.1 Background

This ecological constraints report has been prepared by AECOM on behalf of Locality to assess any ecological constraints to inform the North Benfleet Neighbourhood Development Order (NDO) (hereafter referred to as the Scheme). The Scheme as shown by the red line boundary in Figure 1 is in an area known as North Benfleet within Basildon Borough, Essex. All land situated within this red line is hereafter referred to as the Site.

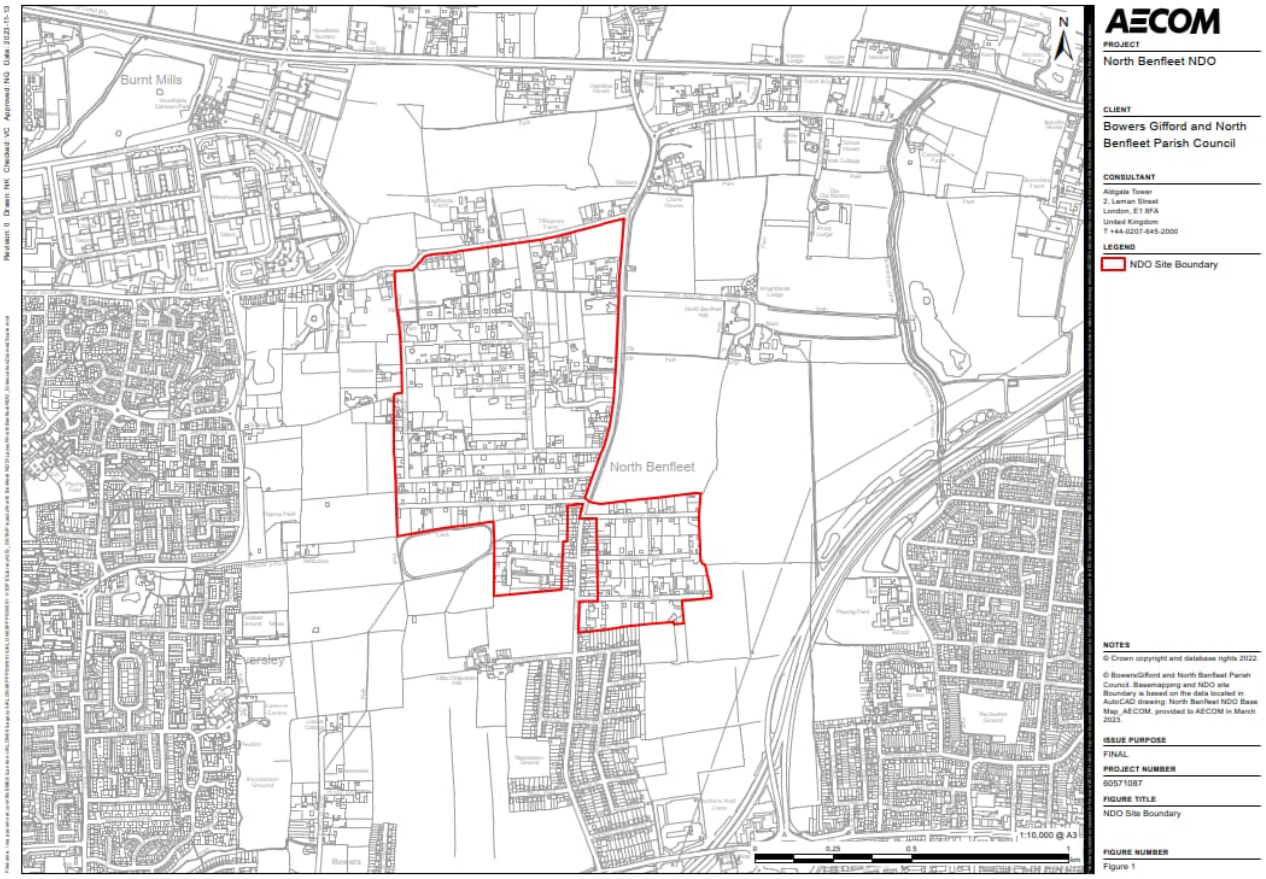

Figure 1. North Benfleet Neighbourhood Development Order (NDO) Site Boundary

The assessment of ecological constraints has been undertaken using data obtained by a desk study with reference to current good practice[1] and forms part of the technical information commissioned by Locality in connection with the Scheme. It was not feasible to undertake a site visit or field surveys at this stage in the NDO process. The report addresses relevant biodiversity legislation and planning policy (as summarised in Appendix A) and is consistent with the requirements of *British Standard 42020:2013 Biodiversity. Code of Practice for Planning and Development.*

This report is intended to provide advice in respect of the design for compliance applications intending to benefit from the provisions of the Scheme, in particular to provide a starting point for considering site layout and / or site investigation. Further ecological surveys and / or ecological impact assessment (including detailed mitigation measures) will be required to inform compliance applications once proposals have been finalised.

The desk study component has been informed by a review of publicly accessible information and a background data search was obtained 14/08/2023 from the Essex Field Club (See Section 2).

A Design Code has been developed which includes how biodiversity enhancement will be addressed in the NDO and that the NDO conditions require a Landscape and Environment Management Plan to be submitted with detailed proposals through the post-NDO compliance process. Further information is provided in Section 4 below.

1.2 The Site

The Site is located east of Basildon, north of Bowers Gilford and South Benfleet and south of Wickford at Ordnance Survey national grid reference TQ 75472 89669 and is slightly under 80 hectares in area. The Site is one of the remaining Basildon plotland areas which consisted of small plots of land sold in the first half of the 20th century to people who built weekend cottages, holiday bungalows or smallholdings. Today, the area is occupied by low density housing and several light industrial business units, and existing vegetation including large paddocks and fields.

1.3 The Scheme

The NDO proposes demolition of industrial buildings and the creation of infill development comprising a local centre, approximately 300 dwellings and a loop road.

1.4 Purpose of the Ecological Constraints Report

This report presents ecological information obtained during a desk study undertaken in August 2023 to obtain information about:

- any sites designated for their biodiversity value within 5 km for international sites and 2 km for statutory and non-statutory sites;
- notable habitats[2];
- protected and notable species[3]; and
- scheduled invasive non-native species.

The area covered by the desk study is hereafter referred to as the Study Area. This included a search of publicly available information, the use of aerial and street-view photography and a data search of biological records from Essex Field Club database and publications and any other publicly accessible resources

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The purpose of this report is to provide a high-level ecological appraisal of the Site, specifically to:

- establish baseline conditions and determine the presence of any Important Ecological Features (IEF)[4] (or those that could be present), as far as is possible;

[1] CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal, 2nd edition.* Chartered Institute of Ecology and Environmental Management, Winchester.
[2]Notable habitats are taken as principal habitats for the conservation of biodiversity listed under Section 41 of the *Natural Environment and Rural Communities Act 2006*; habitats listed under the Essex Biodiversity Action Plan (BAP); hedgerows identified as being 'important' under the wildlife criteria of the *Hedgerow Regulations 1997*, ancient woodlands and veteran trees.
[3]Notable species are taken as principal species for the conservation of biodiversity listed under Section 41 of the *Natural Environment and Rural Communities Act 2006*; any species listed in an IUCN Red Data Book; and any other species listed under the Essex BAP.
[4] Important Ecological Features are habitats, species, ecosystems and their functions and processes that are of conservation importance and could potentially be affected by the Scheme.

- identify potential ecological constraints to the Scheme and make initial recommendations to avoid impacts on IEFs, where possible;
- describe broad mitigation measures, where possible, including mitigation measures that may be required depending on results of further surveys;
- identify potential requirements for detailed surveys; and,
- identify any opportunities offered by the Scheme to deliver biodiversity enhancements.

The method followed for undertaking the desk study is detailed in Section 2, including any limitations to the assessment.

2. Methods

2.1 Desk Study

2.1.1 Background Records Search

The assessment of ecological constraints was based on a desk study to obtain background records and other information relevant to the Site and the Scheme. The data obtained provide;

- a high level description of the habitats and flora and fauna of the Site and its immediate environs;
- contextual information for the scope of field surveys which are recommended; and
- supplementary information where complete field survey coverage may not be possible.

The Study Area is dependent upon the nature, timing and scale of the Scheme, as well as the location of the Site and the surrounding landscape. These variables all contribute to what is referred to as the Zone of Influence (ZoI) of the Scheme, which is the area over which ecological features may be affected by biophysical changes because of the works and associated activities.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed for:

- Designated sites of biodiversity importance (statutory sites only) within 1 km of the Site, which was extended to 5 km for internationally designated sites: Special Protection Areas (SPAs), Wetlands of International Importance (Ramsar sites) and Special Areas of Conservation (SACs); and
- Notable habitats within 1 km of the Site, these being areas of ancient woodland and 'Habitats of Principal Importance for the Conservation of Biodiversity' included in the England Biodiversity List[5].

On 11th August 2023 the Essex Field Club was contacted to obtain records of:

- sites non-statutorily designated for their biodiversity value (Local Wildlife Site (LoWS)) within 1 km of the Site boundary;
- protected and notable species (fauna and flora) within 1 m of the Site boundary, including Species of Principal Importance for the Conservation of Biodiversity listed under Section 41 of the Natural Environment & Rural Communities Act 2006 in the England Biodiversity List[6]; and
- invasive non-native plants and animals scheduled on the Wildlife and Countryside Act 1981 (as amended) and the Invasive Alien species Order (2019) within 1 km of the Site boundary.

Additionally, a search was made of relevant Essex Field Club publications7 including for protected and notable species of fauna and flora occurring within the Site and, or the Study Area

[5] Section 40 of the Natural Environment & Rural Communities (NERC) Act 2006 requires that the Secretary of State has drawn up, in accordance with Section 41 of the Act and in consultation with Natural England, a list of habitats and species of principal importance for the conservation of biodiversity in England that is known as the *England Biodiversity List.*

[6] Section 40 of the Natural Environment & Rural Communities Act 2006 requires that ethe Secretary of State has drawn up, in accordance with Section 41 of the Act and in consultation with Natural England, a list of habitats and species of principal importance for the conservation of biodiversity in England that is known as the *England Biodiversity List.*

[7] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club, Essex Bird Report and Essex Naturalist

2.1.2 Use of aerial photography and street view

Aerial and ground-level photography available through Google Maps and Google Streetview was used to enhance interpretation of the types of habitats present within and adjacent to the Site. Lengths of hedgerow were identified from aerial photography and Street View, as this habitat is not presented within MAGiC (see above).

2.1.3 Great Crested Newt Pond Search

Ordnance Survey maps and the *Where's the Path* website (https://wtp2.appspot.com/wheresthepath.htm) were used to identify the presence of water bodies within 500 m of the Site boundary, in order to help establish if the land within and immediately surrounding the Site could be used by Great Crested Newt. This species can use suitable terrestrial habitat up to 500 m from a breeding pond[8], though there is a notable decrease in Great Crested Newt abundance beyond 250 m from a breeding pond[9]. Additionally, a paper in the Essex Naturalist provided a relatively recent account of the distribution of Great Crested Newt in Essex[10].

Natural England's Great Crested Newt (GCN) Risk Zones were mapped onto the Site in order to determine which zone or zones it falls under. The three risk zones under the Natural England district level licensing scheme are:

- Red zones have Great Crested Newt populations of regional, national or international importance – developers cannot use district level licensing in these zones;
- Amber zones have Great Crested Newt populations, habitats and dispersal routes – developers can use district level licensing in these zones; and
- Green zones have fewer areas with Great Crested Newt populations – developers can use district level licensing in these zones.

Natural England aims to discourage development in red zones; encourage development away from amber zones where possible.

2.2 Limitations and Assumptions

A site visit and field surveys were not included in the scope of works to facilitate preparation of this report due to the high-level nature of the proposed Scheme at this stage. As a result, information regarding the suitability of the Site to support and contain protected ecological receptors is based on existing information and records including a data search from the Essex Field Club, publicly available aerial photography and websites such as Streetview.

The nature of the NDO process is such that high level appraisals inform the overall Design Code such that targeted field surveys can be undertaken to inform the preparation of Mini Masterplans for specific areas of the Scheme and future compliance applications.

Recommendations given within this report for further surveys relevant for gaining more detailed and more up to date knowledge of ground conditions, which if carried out may result in further survey or mitigation requirements.

3. Ecological Baseline, Constraints and Recommendations

The following sections detail the results of the desk study undertaken to inform this ecological constraints report. Where necessary, recommendations for field surveys to determine the presence or likely absence of likely IEFs and mitigation measures to protect known IEFs are provided.

Regarding background data, recent records are those no older than 10 years prior to the date of the desk study (August 2023). Records outside of this period are historical and would only be reported where more recent records for a feature do not exist. Exceptions to this are detailed in the appropriate sections below.

[8] Great Crested Newt Mitigation Guidelines (English Nature, 2001).
[9] Natural England. An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576) http://publications.naturalengland.org.uk/publication/134002.
[10] Johnson, J. 2022. The distribution Great Crested Newt Triturus cristatus within Essex between 2005-2021. Essex Naturalist, 39, 247-252.

3.1 Sites Designated for their Biodiversity Value

There are two sites within 5 km of the Site that are internationally designated for their biodiversity value, Benfleet and Southend Marshes Special Area of Conservation (SAC) and Ramsar site, and Essex Estuaries SAC, Special Protection Area (SPA) and Ramsar site (Figure 2). One site with a statutory designation for its biodiversity value, Pitsea Marsh Site of Special Scientific Interest (SSSI), is located within 2 km of the Site. Three non-statutory-designated sites: two Local Wildlife Sites and a Nature Improvement Area, are located within 1 km of the Site.

Table 1 summarises the designated sites situated within the Study Area. Figure 2 shows the locations of the designated sites.

Table 1. International, Statutory and Non-Statutory Designated Sites for Nature Conservation

Designated Site	Reason for Designation	Designated Site[11]: location and distance from the Site
Internationally Designated Sites		
Benfleet and Southend Marshes Special Area of Conservation (SAC) and Ramsar site	A European Marine Site including both marine areas and land which is not subject to tidal influence. Supports internationally important populations of regularly occurring migratory bird species. Area: 2290ha. Its Ramsar criteria are that it comprises an extensive series of saltmarshes, mudflats, and grassland supporting a diverse flora and fauna. Internationally important numbers of several species of wintering waterbirds occur at the site.	4.3 km south-east
Essex Estuaries SAC, Crouch & Roach Estuaries Special Protection Area (SPA) and Ramsar site	The Essex Estuaries (SAC) is the second largest estuarine site on the east coast of England. the SAC contains almost 20 per cent of British saltmarshes and includes a diverse range of substrate habitats and sediments from fine estuarine muds and muddy sand to coarse sand and gravel. With high nutrient contents, it is a highly productive coastal ecosystem supporting mudflats, sandflats and sub tidal areas which many migratory birds rely on throughout their lifecycles. Large wildfowl populations are sustained by saltmarsh flowers, terrestrial grasses, seeds and seagrasses such as the abundant seagrass beds at Shoebury and Foulness. Area: 46,109.95 ha. Crouch & Roach Estuaries Special Protection Area overlaps the SAC and its criteria are its assemblage of water birds during the winter, including dunlin (*Calidris alpina*), red knot (*Calidris canutus*), common ringed plover (*Charadrius hiaticula*), hen harrier (*Circus cyanus*), black tailed godwit (*Limosa limosa*), grey plover (*Pluvialis squatarola*), pied avocet (*Recurvirostra avosetta)* and common redshank (*Tringa totanus*). Area: 1847.87 ha. Crouch & Roach Estuaries Ramsar criteria are extensive and diverse saltmarsh, and a narrow strip of tidal mud. The dark-bellied Brent Goose, (*Branta bernicla bernicla*), occurs in internationally important numbers, and three other species of wader and wildfowl occur in nationally important numbers. The site supports a diversity of aquatic and terrestrial invertebrates and an outstanding assemblage of nationally scarce plants. Area: 1847.87 ha.	5 km north-east
Statutory Designated Sites		
Pitsea Marsh Site of Special scientific Interest (SSSI)	A mosaic of habitats, including scrub, grassland, reedbed and fen, open water and saltmarsh. The reedbed in Pitseahall Fleet is the largest known in South Essex. The diversity of habitats supports an outstanding range of invertebrates, including several local and nationally rare damselflies, dragonflies, moths, flies and beetles. Area: 92 ha.	1.8 km south south-west
Non-Statutory Designated Sites		
Rushbottom Lane Flood Pound Local Wildlife Site (LoWS CPT3)	This is a very varied site containing both marshy and dry grassland with scattered scrub, marshy grassland being poorly	400 m east

[11]Where designated sites are situated outside of the Site boundary, the distance and direction is given at the closest point of the designated site from the Site.

Designated Site	Reason for Designation	Designated Site[11]: location and distance from the Site
	represented in the District[12]. The grassland is species-rich with a good mix of sedges, rushes, grasses and herbs, including Black Sedge (*Carex nigra*), which is rare in south Essex. Other characteristic species include Meadow Foxtail (*Alopecurus pratensis*), Crested Dog's-tail (*Cynosurus cristatus*), Agrimony (*Agrimonia eupatoria*), False Fox-sedge (*Carex otrubae*), meadow Barley (*Hordeum secalinum*), Grass Vetchling (*Lathyrus nissolia*), Hard Rush (*Juncus inflexus*) and meadow-grasses (a species of *Poa*). Area: 3.3 ha	
Home Farm Meadow LoWS (Ba49)	This narrow, unimproved meadow has a sward composed of Creeping Bent (*Agrostis stolonifera*), Tufted Hair-grass (*Deschampsia cespitosa*) and Crested Dog's-tail (*Cynosurus cristatus*) with Hairy Sedge (*Carex hirta*), Burnet-saxifrage (*Pimpinella saxifraga*), Common Knapweed (*Centaurea nigra*), Meadow Buttercup (*Ranunculus acris*), Hoary Ragwort (*Senecio erucifolius*) and the Essex Red Data List species Pepper Saxifrage (*Silaum silaus*) and Sneezewort (*Achillea ptarmica*). Area: 1.2 ha	700 m north
Greater Thames Marshes Nature Improvement Area	A natural landscape under pressure from habitat loss and disturbance. This Nature Improvement Area aims to work with local communities, visitors, businesses and experts to restore this valuable habitat and increase the numbers of endangered species by protecting existing flora and fauna. Approximately 50,000 ha	1 km south

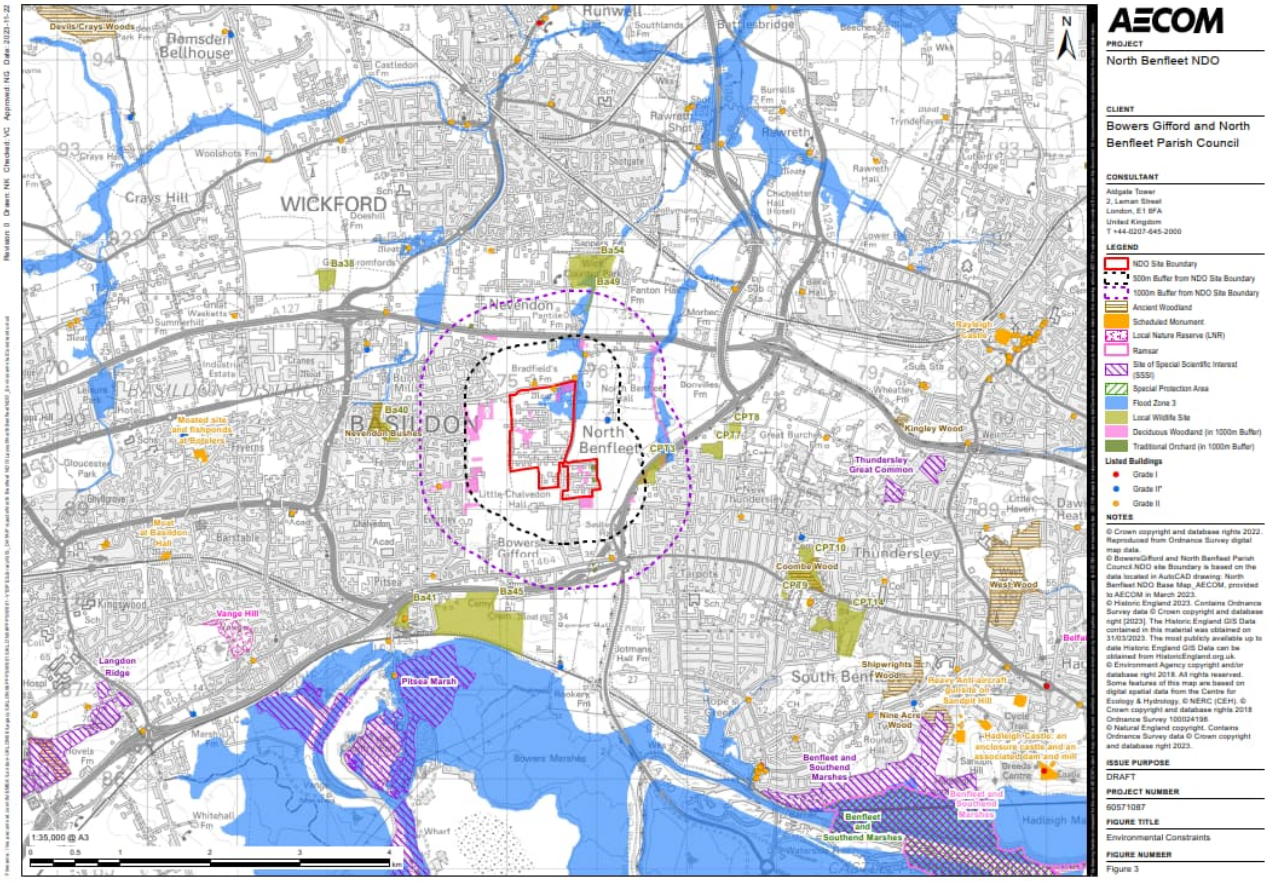

Figure 2. Potential Environmental Constraints including Sites Designated for their Biodiversity Value

[12] Harvey, N. 2013. Castle Point Borough Local Wildlife Sites Review 2012. Prepared by EECOS (Essex Ecology Services Ltd.) for Castle Point Borough, November 2012

3.1.1 Constraints and Recommendations

3.1.1.1 Sites Designated Internationally for their Biodiversity Value

Information was collated to inform a Habitats Regulations Assessment (HRA) of the new Basildon Local Plan undertaken in 2015 and the latest report dates from October 2018[13]. To inform the Essex coastal Local Plans, an Essex Coast Recreational Disturbance Avoidance & Mitigation Strategy (RAMS) was produced in early 2019[14]. This confirmed the recreational zone of influence for all the Essex coastal European sites (SACs and SPAs). The Benfleet and Southend Marshes SPA and Ramsar site was identified as having a core recreational catchment (or zone of influence) of 4.3 km and the Crouch and Roach Estuaries SPA and Ramsar and overlapping Essex Estuaries SAC was identified as having a core recreational catchment (or zone of influence) of 4.5 km. The Site falls within the zone of influence of the Benfleet and Southend Marshes SPA and Ramsar site and therefore has the potential to operate negatively in combination with other growth in Basildon. As such it is anticipated that a financial contribution towards implementing the RAMS is likely to be required to mitigate for the recreational effects arising from residents of the development to be brought forward by the NDO. This is conditioned in the NDO.

3.1.1.2 Sites Designated Statutorily for their Biodiversity Value

Pitsea Marsh SSSI, which is of national biodiversity value, is located approximately 2 km south-west of the Site (Figure 2). Pitsea Marsh SSSI comprises a mosaic of habitats, including scrub, grassland, reedbed and fen, open water and saltmarsh. Currently the northern half of the SSSI has no public access, however the southern half of the SSSI is Wat Tyler Country Park which may already be subject to disturbance from the public; dog walking potentially disturbing waterfowl. Whilst not accessible via Public Rights of Way from the Site, the Wat Tyler Country Park is only a short drive away and therefore the Scheme brought forwarded by the NDO may result in a recreational impact on the SSSI.

3.1.1.3 Sites Designated Non-Statutorily for their Biodiversity Value

Two Essex Local Wildlife Sites are located within 1km of the Site – Rushbottom Lane Flood Pound (CPT3) and Home Farm Meadow (Ba49) (Table 1 and Figure 2). These sites may be subject to increased recreational pressure from the likely additional population in the complete and operational development brought forward by the NDO. Residents of the development would be able to access Rushbottom Lane Flood Pound LoWS due the Public Right of Way (a byway) under the A130. Although Home Farm Meadow LoWS is only 700 m from the Scheme, it is separated from it by the Southend Arterial Road (A127) and has no public access.

The Greater Thames Marshes Nature Improvement Area (GTMNIA) is estuarine marshland stretching from East London to Whitstable in Kent and Southend in Essex. It is one of the most important estuaries in Europe for some 300,000 wintering waterfowl and is home to endangered species such as the Water Vole (*Arvicola amphibius*), Shrill Carder Bee (*Bombus sylvarum*), and unique invertebrates of the Thames Terrace soils and many farmland birds. This valuable natural landscape is under pressure from habitat loss and disturbance through growth of developments, roads and other infrastructure; colonisation by invasive species that outcompete native species of flora and fauna, such as American Mink (*Neovison vison*) (a predator of Water Vole), and climate change, where sea-level rise will swallow up inter-tidal habitats leading to further loss of this valuable habitat. The GTMNIA seeks to protect and enhance this valuable habitat and increase numbers of endangered species and protect existing flora and fauna. Thus this important landscape that is highly protected by national and international legislation is failing to live up to its full potential.

Although the GTMNIA is separated from the Site by the A13 and B1464 and the main line London-Southend-on-Sea railway, it covers the designated sites as described above and hence in the same way could be negatively impacted by the Scheme. Additionally, the Scheme will where feasible, seek to support achieving vibrant marshes and an estuarine landscape where residents, businesses and experts work together for the benefit of wildlife to create a robust natural landscape that can exist alongside development and has greater resistance to the challenges of climate change. Consideration be given in particular to biodiversity enhancements with respect to the Site and, where relevant species such as Water Vole, farmland birds and insects including Shrill Carder Bee.

Indirect impacts to nearby non-statutory sites (closest is 400 m to east) during construction will be managed by implementing best-practice measures with respect to dust, noise and air/water pollution in a Construction and Environmental Management Plan (CMP) or equivalent.

To reduce impacts because of additional recreational pressure on nearby wildlife sites because of the residents of the development, enhanced green infrastructure for the public to use within the Scheme is recommended and the NDO and Design Code make provision for the provision of additional public amenity open space. This additional provision should

[13] LUC, (2018); Basildon Borough Local Plan HRA Report, Habitats Regulations Assessment, October 2018
[14] Essex County Council and Place Services, Essex Coast Recreational Disturbance Avoidance & Mitigation Strategy (RAMS) Habitats Regulations Assessment Strategy document 2018 - 2028

meet the Successful Criteria for Public Open Spaces set out in the Essex Design Guide: https://www.essexdesignguide.co.uk/design-details/landscape-and-greenspaces/successful-criteria-for-public-open-spaces/ Additionally, the provision of a mitigation package could include the provision of signage, education and physical on-site measures. This could be delivered working together with landowners and other organisations that promote access (which may be on a seasonal basis) depending on the qualifying feature of each protected site.

3.1.1.4 Flood Zone 2

The north-east corner of the Scheme lies within the upper reaches of North Benfleet Brook (Flood Zone 1) (Figure 2). This part of the Scheme is more likely to support a flora and fauna with indications of dampness and wetland.

3.2 Habitats

The Site, approximately 80 ha, comprises roads and buildings in a plotlands setting with woodlands, scattered trees, hedgerows, water bodies, ditches and rough grassland within the Site and in its environs. The woodlands are small deciduous woodlands and some traditional orchards (Figure 3). The soil to the north and east is loamy with some clay (slightly acid loamy and clayey soils with impeded drainage) and to the south and west it is loamy and clayey (Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils). The estimated extents of the habitat are shown in Tables 2 and 3 and Figure 4. Figure 5 shows the Site in 1945 and apart from some small differences outlined below in woodland and water bodies, the Site appears to be much the same today as it was in 1945.

A search was made of records of notable habitats and protected or notable flora[15] (including veteran trees[16]) within the Study Area. Table 2 summarises the records of these habitats[17]. No records of protected or notable flora were found in the Study Area.

Adjacent habitats comprise arable farmland, recreational land use, industrial land use and extended suburban areas. Figure 4 shows the distribution of habitats within and adjacent to the Site.

3.2.1.1 Ancient Woodland and other woodland

No woodlands listed as ancient woodland or on the National Forest Inventory 2014 are located within the Study Area. There are two types of Habitats of Principal Importance (listed on Section 41 of the Natural Environment and Rural Communities Act, 2006) within the Study Area – Deciduous Wood and Traditional Orchards (Table 2 and Figure 3). A review of aerial photography identified approximately 1.92 km of hedgerows (Habitats of Principal Importance) within the Site (see Figure 4).

Within the Site there are seven Deciduous Woodlands (six less than 0.5 ha and one of 1.65 ha) and three Traditional Orchards (two small and one large) (Table 2 and Figure 2).

Table 2. Notable Habitats within the Study Area

Habitat/ Flora Feature		Label (see Figure 3)	Reason for Conservation Interest	Location of Habitat/ Flora[18]
The Site				
Deciduous woodland (0.12ha)		DW1	Priority Habitat Inventory	Within the Site
Deciduous woodland (0.21ha)		DW2	Priority Habitat Inventory	Within the Site
Deciduous woodland (0.25ha)		DW3	Priority Habitat Inventory	Within the Site
Deciduous woodland (0.33ha)		DW4	Priority Habitat Inventory	Within the Site
Deciduous woodland (0.42ha)		DW5	Priority Habitat Inventory	Within the Site
Deciduous woodland (0.46ha)		DW6	Priority Habitat Inventory	Within the Site
Deciduous woodland (1.65ha)		DW7	Priority Habitat Inventory	Within the Site
Total Deciduous Woodland	3.44 ha			
Traditional orchard (0.35ha)		TO1	Priority Habitat Inventory	Within the Site

[15] For this assessment 'flora' includes vascular and non-vascular plants, fungi and lichens.
[16] For this assessment the definition of a veteran tree is taken from Annex 2 of the National Planning Policy Framework (glossary): "A tree which, because of its great age, size or condition is of exceptional value for wildlife, in the landscape, or culturally."
[17] MAGIC (defra.gov.uk)
[18] Where features are situated outside of the Site boundary, the distance and direction is given at the closest point of the designated site from the Site

Habitat/ Flora Feature		Label (see Figure 3)	Reason for Conservation Interest	Location of Habitat/ Flora[18]
Traditional orchard (0.39ha)		TO2	Priority Habitat Inventory	Within the Site
Traditional orchard (2.19ha)		TO3	Priority Habitat Inventory	Within the Site
Total Traditional Orchard	2.93 ha			
Total Notable Woodland	**6.37 ha**			
The Study Area (outside the Site)				
Total Traditional Orchard	0.07 ha		Priority Habitat Inventory	100 m north
Total Deciduous woodland	5.17 ha		Priority Habitat Inventory	150 -450 m north, east or west
Total Notable Woodland	**5.24 ha**			

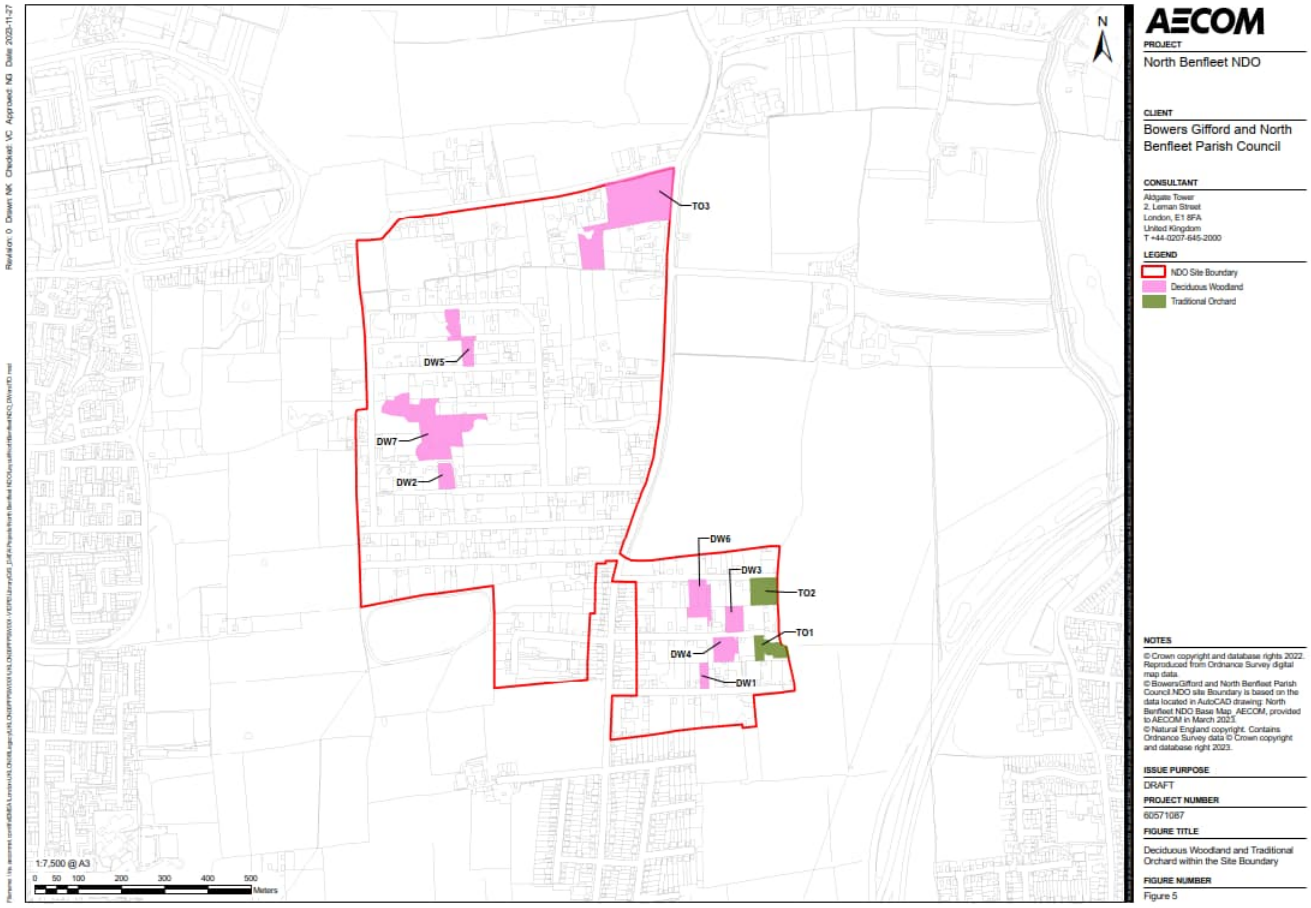

Figure 3. Deciduous Woodland and Traditional Orchard on Site

3.2.1.2 Habitat Types

The Living England Habitat Map (Phase 4)[19] and aerial and street view photography Google maps, Google street view and Bing Maps were used to identify broad habitat types within the Site. These are summarised in Table 3 and Figure 4.

[19] https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::living-england-habitat-map-phase-4/explore?location=51.578292%2C0.532872%2C16.00

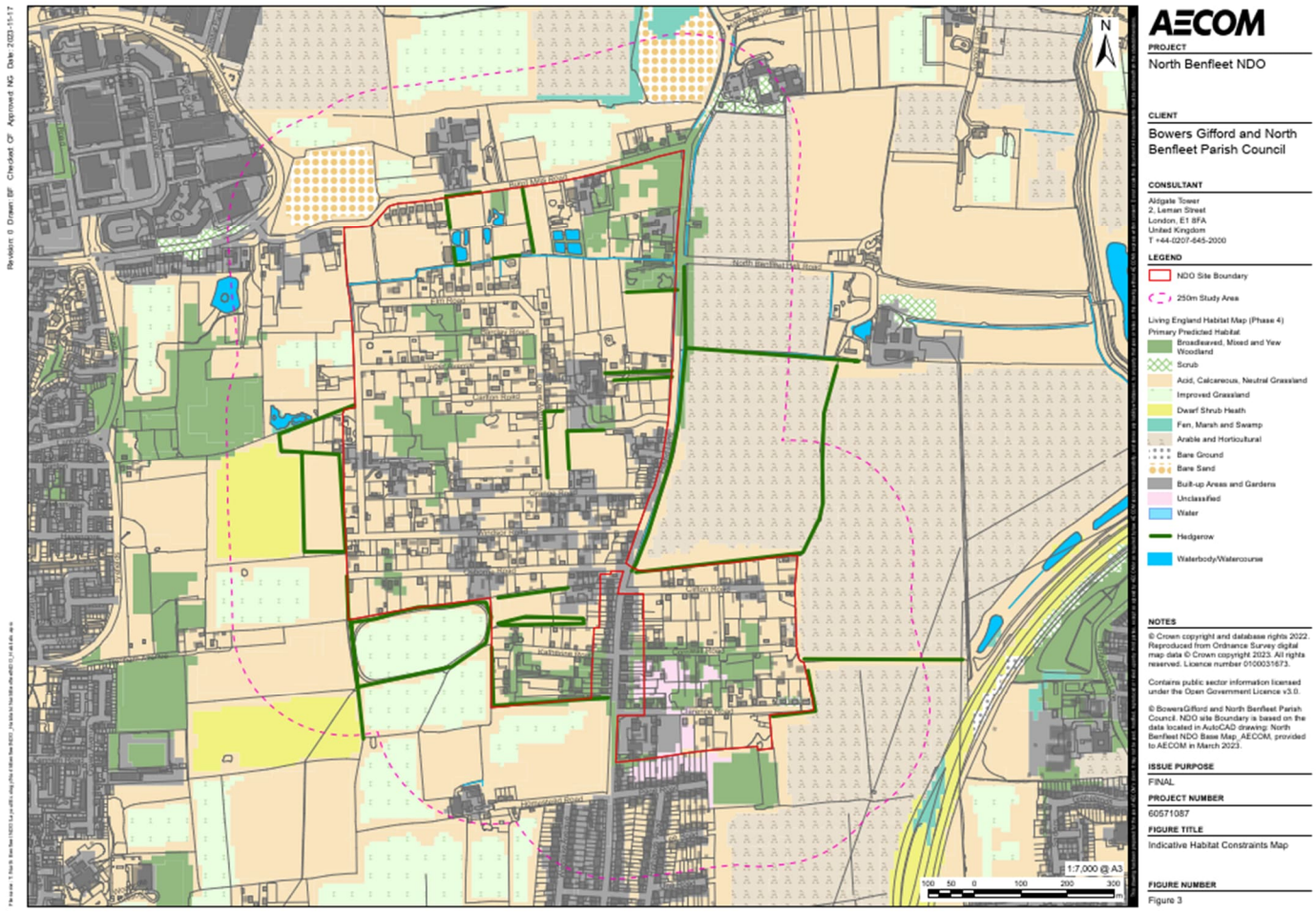

Figure 4. Distribution of Habitats within and around North Benfleet NDO Site

Table 3. Extent of Habitat Types within the Site

Living England Habitat (OS VML Buildings and waterbodies)	Area (m²)	Area (ha)	% Cover
Acid, Calcareous, Neutral Grassland	525,177	52.52	66.0
Arable and Horticultural	621	0.06	0.1
Broadleaved, Mixed and Yew Woodland	107,326	10.73	13.5
Built-up Areas and Gardens	146,719	14.67	18.4
Scrub	649	0.06	0.1
Unclassified	10,164	1.02	1.3
Waterbody	4,979	0.50	0.6
Total	**795,634**	**79.56**	**100.0**
Linear Habitat	**Length (m)**	**Length (km)**	
Watercourse (ditch or drain)	745	0.745	
Hedgerow	1,919	1.92	

Two woodlands currently shown on the 1:50,000 Ordnance Survey (OS) map were not shown on the 1:63,360 OS map (Figure 5) suggesting that these are relatively young woodlands.

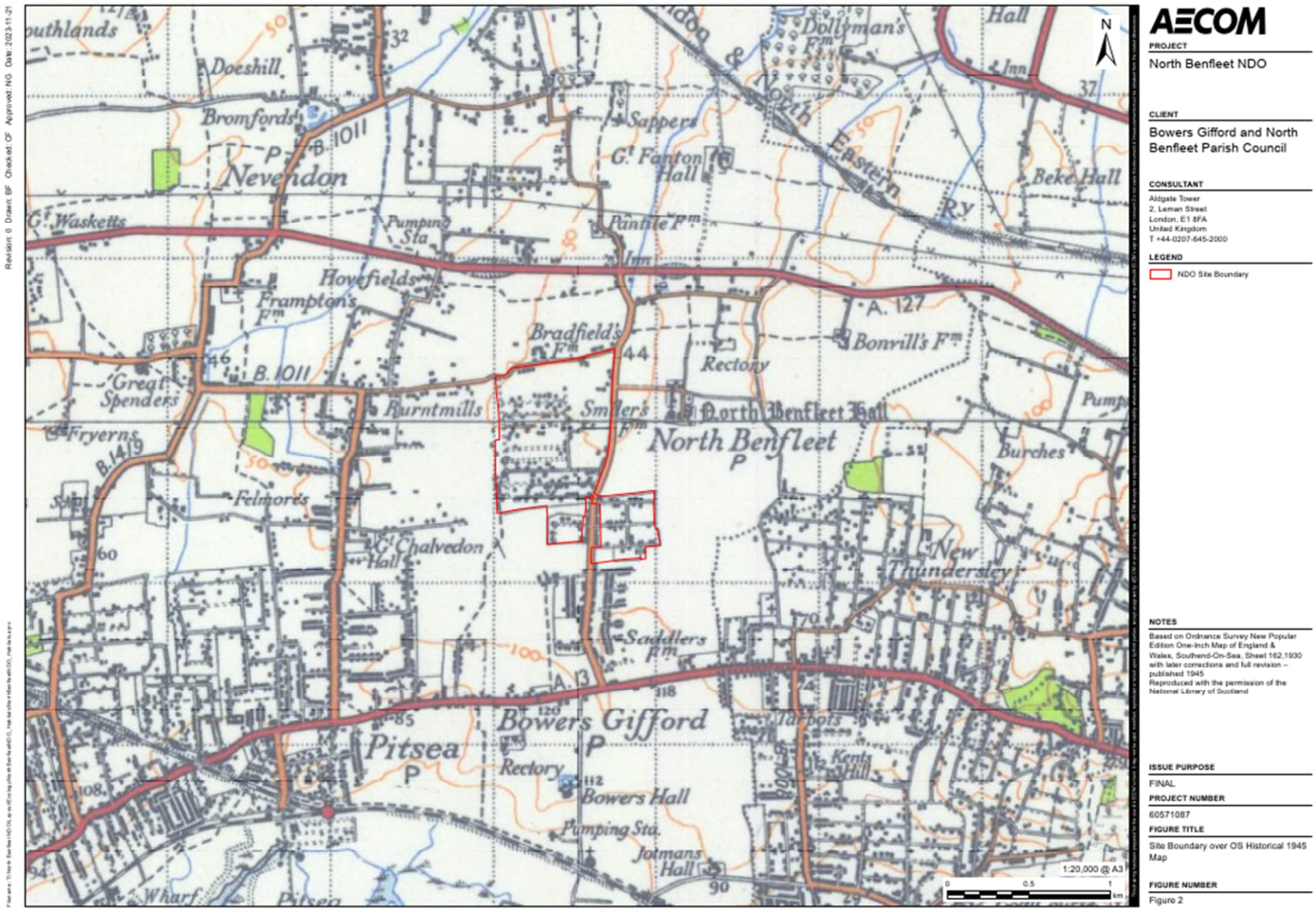

Figure 5. Ordnance Survey 1:63,360 map of the North Benfleet NDO Site and its Environs

A total of 17 water bodies are present within the Site or within 500 m of the Site. Nine of these are ponds present within the Site at the northern end. Five are at Tiffaynes Farm currently shown as a single waterbody on the 1:50,000 OS map, but not shown in the 1:63,360 OS map of 1945 (Figure 5). There are a further four ponds immediately west of Tiffaynes Farm. A ditch or drain (745 m in length) flows west to east across the northern part of the Site, discharging into the upper reach of North Benfleet Brook which is immediately adjacent to the Site on the east side of Pound Lane. The brook flows north through the Wisk Country Park and is a tributary of the River Crouch.

3.2.2 Constraints and Recommendations

Deciduous woodland, traditional orchards, hedgerows and water bodies on the Site and adjacent to it have the potential to support a wide variety of wildlife including protected species such as Badger, Great Crested Newt, bats, nesting birds, reptiles, and invertebrates. Following approval of the NDO, it is expected that individual developers will bring forward compliance applications for separate parts of the Site. It is recommended that habitat surveys are completed for each Mini Masterplan or parcel brought forward in compliance applications. The surveys would:

- identify which types of grassland are present and their extent;
- assess the condition of each habitat parcel;
- undertake an appraisal of the potential for trees to support bat roosts;
- survey the hedgerows in accordance with the Hedgerow Regulations 1997;
- assess waterbodies within and, where accessible, adjacent to the Site including for suitability to support breeding Great Crested Newt; and
- search for evidence of any other protected species such as Badger, amphibians other than Great Crested Newt and reptiles.

The Design Code will specify that the Scheme with respect to biodiversity will follow the hierarchy of avoidance, mitigation and then compensation with the overall aim of achieving a net gain in biodiversity. Without mitigation, habitats of Principal Importance (Deciduous Woodland, Traditional Orchards, and Hedgerows) are at risk of being negatively impacted by the Scheme.

It is recommended to avoid the removal of these habitats and instead retain and enhance them within the Scheme. These habitats can be enhanced by supplementing them with additional appropriate native planting, management regimes that encourage biodiversity and establishing dark corridors or low lighting scheme in ecologically sensitive areas of the Site.

3.3 Species

3.3.1 Badger

3.3.1.1 Desk Study

There are eight recent records of Badger within the Study Area but none from within the Site. The closest of these records is approximately 200 m from the Site boundary. Given the distribution of badger in this part of Essex[20], it is highly likely that there will a Badger sett or setts within the Site.

Constraints and Recommendations

Badgers and their setts are protected from disturbance and destruction by the Protection of Badgers Act (1992)[21].

Under this act it is an offence to:

- wilfully kill, injure or take a Badger (or attempt to do so);
- cruelly ill-treat a Badger;
- dig for a Badger;
- intentionally or recklessly damage, destroy or obstruct access to a Badger sett;
- cause a dog to enter a Badger sett; and
- disturb a Badger when it is occupying a sett.

It is recommended to carry out presence/absence walkover surveys for Badgers and their setts using best practice guidance survey methods[22]. If Badger setts are present, these are likely to be significantly negatively impacted by the Scheme brought forward by the NDO, without mitigation.

It is recommended to avoid the removal of Badger setts and instead retain and enhance the surrounding habitat within the Scheme. Where Badger setts cannot be avoided, setts can only be closed under a Natural England mitigation licence between November and February. Planning consent must be in place before actions under a mitigation licence can be undertaken.

During construction, mitigation measures must be carried out to protect Badgers i.e. covering up excavations at night, keeping hazardous chemicals in a secure lock up and erecting hoarding to exclude badger access to the Site.

[20] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club
[21] HMSO. (1992) Protection of Badgers Act.
[22] Harris, S., Cresswell, P., & Jefferies, D. J. (1989). Surveying badgers. Mammal Society.

3.3.2 Bats

3.3.2.1 Desk Study

There are no records of bats within the Site. Apart from Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*), there are no recent records of other bat species within the Study Area. Soprano Pipistrelle is listed on Section 41 of the NERC Act.

3.3.2.2 Constraints and Recommendations

The deciduous woodland and buildings within the Site may have potential to support roosting bats. Some of the buildings are proposed to be demolished as part of the development and some tree removal may be unavoidable. Buildings and trees should be assessed for potential roost features in an initial scoping survey and further presence/absence surveys may be required to inform appropriate mitigation measures. These surveys are recommended prior to the start of any works within the Site.

All UK bats, and their roosting sites are protected from harm, killing and disturbance by Schedule 5 of the Wildlife and Countryside Act and the Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitat Regulations).

If bat roosts are identified on Site, it is recommended to retain the roosts *in situ* and enhance the surrounding habitat within the development. Where removal of bat roosts cannot be avoided, an application must be made to Natural England for a bat mitigation licence. Planning consent must be in place before actions under a mitigation licence can be undertaken.

Bats use green corridors such as hedgerows, woodland and green verges along railways for commuting and foraging. Bats also use waterbodies and waterways as foraging areas. From aerial photography, it appears that habitats within the Site are suitable for commuting and foraging bats.

Post-construction, the NDO should make provision for enhancements for bats including appropriate native planting, management regimes that encourage biodiversity and establishing a dark corridor or low lighting scheme design, and artificial bat boxes on buildings and/or trees.

3.4 Hazel Dormouse

3.4.1.1 Desk Study

There are no recent records of Hazel Dormouse (*Muscardinus avellanarius*) within the Site or the Study Area and the species has not been found in this area since at least 1980[23].

3.4.1.2 Constraints and Recommendations

Depending on the species composition of the deciduous woodland and hedgerows within the Site, they may be suitable to support Hazel Dormouse. An initial scoping survey of these habitats is recommended to determine the likelihood of hazel dormouse presence. Following on from this, further presence/absence surveys may be recommended following the scoping survey.

Hazel dormouse is a European Protected Species, protected under the Habitats Regulations (2017, as amended), and the species and the habitats that it uses for breeding and resting are protected by Schedule 5 of the Wildlife and Countryside Act.

It is recommended to avoid the removal of habitats suitable for Hazel Dormouse and instead retain and where possible enhance them with a view to encouraging the species to colonise the development.

Post-construction, the NDO could make provision for enhancements for Hazel Dormouse including artificial nest boxes on trees, appropriate native planting, management regimes that encourage biodiversity and establishing a dark corridor or low lighting scheme.

[23] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club.

3.5 Water Vole

3.5.1.1 Desk Study

There are no recent records of Water Vole (*Arvicola amphibius*) within the Site or within the Study Area, although this species was known in or close to the Site, north and south, in the period 2008-2014[24].

A total of 17 water bodies are present within the Site or within 500 m of the Site. All these waterbodies require further assessment to determine if they are suitable for Water Vole.

3.5.1.2 Constraints and Recommendations

It is recommended that the water bodies within the Site and within 500 m of the boundary of the Site are assessed for Water Vole suitability. If any of these water bodies are considered to be suitable to support Water Vole, then further surveys may be recommended.

Without mitigation, Water Vole has the potential to be significantly negatively impacted by the development brought forward by the NDO.

When development work is proposed in or near an area which is either known to or likely to contain Water Vole, then the developer will need to implement suitable mitigation to prevent impacts to water voles. The preferred mitigation option is to leave water voles *in situ*, adopting avoidance measures through redesign of the development.

Where impacts cannot be avoided, operations aimed at displacing water voles from a development site are now no longer covered by the "*incidental result of an otherwise lawful action*" defence in the Wildlife and Countryside Act 1981 (as amended). Displacement of water voles now needs to be undertaken under a licence.

In England, small scale (limited to continuous lengths of bank not exceeding 50m) displacement of water voles can be carried out at certain times of the year (February to April) for the purposes of conservation under a Class Licence by a registered person. For larger scale displacements or displacements outside of this period, displacement can be undertaken under a site-specific conservation licence.

Where it is considered that the best outcome for Water Vole is capture and translocation to a different location then this action is considered by Natural England to be outside the scope of the defence as the intentional capture of water voles is unlikely to be considered 'incidental'. In these circumstances there may be genuine grounds for issuing a conservation licence for the purpose of translocating the water vole population to suitable alternative habitat.

Post-construction, the design of the development should provide enhancements for water vole including waterbodies and ditches with appropriate native planting, management regimes that encourage biodiversity and mammal adaptions in tunnels at new culverts.

3.6 Other mammals

3.6.1.1 Desk Study

Other mammals that are known to occur within the Site and, or the general area[25], which are listed in Section 41 of the NERC Act (2006) are:

- Harvest Mouse (*Micromys minutus*); and
- Brown Hare (*Lepus europaeus*).

Although there are no records of Brown Hare from the Site nor the wider Study Area since at least 1980, the species is widely distributed throughout Essex[26],

Despite concerns about the national status of Harvest Mouse, an elusive mammal, it is widely distributed throughout Essex, with nests commonly found in suitable habitat where long grasses grow through bramble or other supporting vegetation[27].

If suitable habitat is found to be present for either or both species, consideration should be given to completing surveys to check for presence in or adjacent to the Site.

[24] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club
[25] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club
[26] Dobson, J. and Tansley, D. 2014. Mammals of Essex. Essex Field Club.
[27] Dobson, J. 2017. Some Essex mammals in 2016. Essex Naturalist, 34, 97-99

3.7 Birds

3.7.1.1 Desk Study

There are recent records for 37 notable[28] bird species within the Study Area some of which overlap with the Site (location "North Benfleet" in Table 4). Of the 37 species, two species are listed on Annex I of the EC Birds Directive, six species on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 13 species on the Birds of Conservation Concern 5 (BoCC5) Red list, and 22 species on the BoCC5 Amber list. The records also include two species of bird that are priority species in Essex and listed on the Essex Biodiversity Action Plan (BAP)[29].

Table 4. List of notable birds found in desk study

Common Name	Latin Name	Location	Last Recorded
Species listed on Annex I of the EC birds Directive			
Avocet	*Recurvirostra* avosetta	North Benfleet	2020
Little egret	*Egretta garzetta*	Wick Country Park, Wickford	2016
Schedule 1 of the Wildlife and Countryside Act			
Avocet	*Recurvirostra* avosetta	North Benfleet	2020
Black-tailed godwit	*Limisa limosa*	North Benfleet	2020
Fieldfare	*Turdus pilaris*	Woodside Park, Thundersley	2016
Green sandpiper	*Tringa ochropus*	Rushbottom Lane	2015
Greylag Goose	*Anser anser*	Wick Country Park, Wickford	2022
Redwing	*Turdus merula*	Woodside Park, Thundersley	2016
Birds of Conservation Concern 5 (BoCC5) Red list			
Black-tailed godwit	*Limisa limosa*	North Benfleet	2020
Curlew	*Numenius arquata*	North Benfleet	2020
Dunlin	*Calidris alpina*	North Benfleet	2020
Fieldfare	*Turdus pilaris*	Woodside Park, Thundersley	2016
Greenfinch	*Chloris chloris*	Wick Country Park, Wickford	2022
Herring gull	*Larus argentatus*	Wick Country Park, Wickford	2022
House sparrow	*Passer domesticus*	Wick Country Park, Wickford	2022
Mistle Thrush	*Turdus viscivorus*	Woodside Park, Thundersley	2016
Skylark	*Alauda arvensis*	Wick Country Park, Wickford	2022
Starling	*Sturnus vulgaris*	North Benfleet	2021
Swift	*Apus*	North Benfleet	2021
Woodcock	*Scolopax rusticola*	A127 Alton nursery	2015
Yellowhammer	*Emberiza citronella*	Rushbottom Lane	2015
Birds of Conservation Concern 5 (BoCC5) Amber list			
Avocet	Recurvirostra avosetta	North Benfleet	2020
Black-headed gull	*Chroicocephalus ridibundus*	Wick Country Park, Wickford	2022
Bullfinch	*Pyrrhula*	Woodside Park, Thundersley	2016
Common Gull	*Larus canus*	North Benfleet	2020
Dunnock	*Prunella modularis*	North Benfleet	2021
Great black-backed gull	*Larus marinus*	North Benfleet	2020

[28] Notable bird species are taken as those listed: on Annex I of the EC Birds Directive (2009/147/EC); on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); as Species of Principal Importance (SPI) for the Conservation of Biodiversity in England listed in Section 41 of the Natural Environment and Rural Communities Act 2006; as Red or Amber in the Birds of Conservation Concern (BoCC) 5 (Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747); bird species or groups listed under the Essex BAP.

[29] Various organisations (1997) The Essex Biodiversity Action Plan.

Common Name	Latin Name	Location	Last Recorded
Green sandpiper	*Tringa ochropus*	Rushbottom Lane	2015
Greylag goose	*Anser*	Wick Country Park, Wickford	2022
Kestrel	*Falco tinnunculus*	A127/A130	2020
Mallard	*Anas platyrhynchos*	Wick Country Park, Wickford	2022
Meadow pipit	*Anthus pratensis*	North Benfleet	2020
Moorhen	*Gallinula chloropus*	Wick Country Park, Wickford	2022
Redwing	*Turdus iliacus*	Woodside Park, Thundersley	2016
Reed bunting	*Emberiza schoeniclus*	North Benfleet	2020
Shelduck	*Tadorna tadorna*	North Benfleet	2020
Sparrowhawk	*Accipter nisus*	Rushbottom Lane	2015
Song Thrush	*Turdus philomelos*	North Benfleet	2021
Stock Dove	*Columba oenas*	North Benfleet	2021
Teal	*Anas crecca*	North Benfleet	2020
Wigeon	*Mareca penelope*	North Benfleet	2020
Woodpigeon	*Columba palumbas*	Wick Country Park, Wickford, A127 Burnt Mills	2022
Wren	*Troglodytes trolodytes*	North Benfleet	2021
Priority species in Essex and listed on the Essex Biodiversity Action Plan (BAP)			
Skylark	*Alauda arvensis*	Wick Country Park, Wickford	2022
Song Thrush	*Turdus philomelos*	North Benfleet	2021

3.7.1.2 Constraints and Recommendations

The reason that several notable wetland birds are appearing in the desk study (such as avocet, black tailed godwit and green sandpiper) is that Wat Tyler Country Park, an RSPB reserve, is 2 km from the Site. However, most baseline habitats within the Scheme do not include wetland habitats and are not expected to support notable bird species. There are waterbodies in the north of the site, and these will be assessed as part of compliance applications, upon approval of the NDO. It is recommended to retain and enhance these habitats. Following the mitigation below, the Scheme is unlikely to have significant negative impacts on notable birds.

Breeding birds and their nests are protected under the Wildlife and Countryside Act (1981, as amended). Schedule 1 species are afforded additional protection which makes it an offence to disturb individuals of these species when 'at or near' an active nest.

A breeding bird survey, undertaken using best practice methods[30], is recommended to inform appropriate mitigation for notable bird species potentially present on the Site.

It is recommended that any trees or scrub vegetation are removed outside of the bird nesting season (March to August inclusive) to prevent breeding birds from being disturbed.

If any site clearance (of both buildings and vegetation) is due to take place between March and beginning of September, an ecologist will be required to confirm the absence of active bird nests immediately prior to works commencing to avoid a breach of legislation.

If a nest is discovered, clearance or other construction works should be stopped immediately within an exclusion zone to be determined by an ecologist (generally 5m radius). The exclusion zone will be demarcated appropriately. The nest will subsequently be monitored, typically on a weekly basis, by a suitably qualified ecologist. Once it is confirmed that all fledglings have flown and ceased to return to the nest, and that no other nests are in use within the exclusion zone, the vegetation can be removed.

Future soft landscaping will include trees, hedgerow and grassland, and will provide habitat of notable bird species previously recorded.

[30] Gilbert, G., Gibbons, D. W., & Evans, J. (1998). Bird Monitoring Methods: a manual of techniques for key UK species.

3.8 Reptiles

3.8.1.1 Desk Study

There are seven recent records of common lizard, slow worm, and adder within the Study Area but none within the Site. The closest of these records to the Site is for adder, approximately 50 m from the Site boundary.

3.8.1.2 Constraints and Recommendations

All native UK reptile species; adder (*Viper berus*), common lizard (*Zootoca vivpara*), grass snake (*Natrix helvetica*), sand lizard (*Lacerta agilis*), smooth snake (*Coronella austriaca*) and slowworm (*Anguis fragilis*), are listed on Schedule 5 of the Wildlife and Countryside Act which protects them against killing or injury.

It is recommended that a walkover of the habitats present within the Site is carried out. If suitable habitat for reptiles is found, then a set of presence/absence surveys may be required ahead of any works starting.

Without mitigation, reptiles and their habitats have the potential to be significantly negatively impacted by the development brought forward by the NDO. Where habitats suitable for reptiles cannot be avoided, reptiles must be dispersed, excluded or translocated from the affected area prior to construction.

Post-construction, the design of the development should provide enhancements for reptiles including native planting, management regimes that encourage biodiversity, log piles and hibernacula.

3.9 Great Crested Newt

3.9.1.1 Desk Study

There are five recent records of Great Crested Newt within the Study Area but not within the Site. The most recent of these records is associated with European protected species licence applications 2015-15235-EPS-MIT-2 and 2015-15235-EPS-MIT-3 which are approximately 990 m from the Site boundary. This concurs with the distribution map for Great Crested Newt in Essex which shows that there are no records from the Site for the period 2005-2021 and likewise for the surrounding 1 km x 1 km squares[31].

A total of 17 water bodies are present within the Site (nine ponds and a ditch or drain) or within 500 m of the Site. All these waterbodies require further assessment to determine if they are suitable for Great Crested Newt.

3.9.1.2 Constraints and Recommendations

The waterbodies on the Site are mainly in the northern part of the Site which coincides with Natural England's GCN (Great Crested Newt) Risk Zones for Essex, the northern part of the Site being in the amber zone with the southern part being in the green zone. Constraints and Recommendations

It is recommended that Habitat Suitability Indices are obtained for the water bodies within 500m of the Site. If any of these water bodies are assessed to be suitable to support Great Crested Newt, then further surveys may be recommended. These may be a combination of eDNA surveys and/or presence/absence surveys.

Great Crested Newt is a European Protected Species, protected under the Habitats Regulations 2017 (as amended), and they and the habitat that they use for breeding and resting are protected by Schedule 5 of the Wildlife and Countryside Act.

Without mitigation, Great Crested Newt (in their terrestrial and breeding phases) has the potential to be significantly negatively impacted by the development brought forward by the NDO. Where removal of habitats suitable for Great Crested Newt cannot be avoided, an application must be made to Natural England for a Great Crested Newt mitigation licence. Planning consent must be in place before actions under a mitigation licence can be undertaken.

Post-construction, the design of the development should provide enhancements for Great Crested Newt including ponds with appropriate native planting, management regimes that encourage biodiversity, log piles and hibernacula and ladders in gulley pots on nearby roads.

[31] Johnson, J. 2022. The distribution Great Crested Newt *Triturus cristatus* within Essex between 2005-2021. Essex Naturalist, 39, 247-252.

3.10 Notable insects

3.10.1.1 Desk Study

The data search returned records of invertebrates within the Study Area, as summarised below in Table 3.

Table 5. Insect records within the Study Area from 2013

Data Source	*Taxon*	*Vernacular*	*Group*	*Schedules*	*Essex Status*	*Location*	*Last Recorded*
Essex Field Club county records	*Pyronia tithonus*	Gatekeeper	Butterfly	Not applicable	Priority species group	Basildon: Eversley Recreation Ground	2016
Essex Field Club county records	*Pieris brassicae*	Large White	Butterfly	Not applicable	Priority species group	Basildon: Eversley Recreation Ground	2016
Essex Field Club county records	*Vanessa cardui*	Painted Lady	Butterfly	Not applicable	Priority species group	Alton Garden Centre, North Benfleet	2015
Essex Field Club county records	*Aglais io*	Peacock	Butterfly	Not applicable	Priority species group	Alton Garden Centre, North Benfleet	2019
Essex Field Club county records	*Aglais urticae*	Small Tortoiseshell	Butterfly	Not applicable	Priority species group	Benfleet	2020
Essex Field Club county records	*Pieris rapae*	Small White	Butterfly	Not applicable	Priority species group	Basildon: Eversley Recreation Ground	2016
Essex Field Club county records	*Lasiommata megera*	Wall	Butterfly	Biodiversity Action Plan UK list of priority species: Priority Species, Biodiversity Lists - England: England NERC Section 41, Red listing based on 2001 IUCN guidelines (from 2010): Near Threatened	Priority species group	Bowers Gifford	2016
Essex Field Club county records	*Macroglossum stellatarum*	Humming-bird Hawk-moth	Moth	Not applicable	Priority species group	Benfleet SS7 4DR (garden)	2021
Essex Field Club county records	*Nezara viridula*	Southern Green Shieldbug	True bug (Hemiptera)	Not applicable	Priority species group	Alton Garden Centre, North Benfleet	2022

In addition to the records in Table 3, the Essex Field Club has published accounts of certain insect taxa in Essex. Species listed on Section 41 of the NERC Act (2006) that have been recorded in the general area of the Site include:

- Butterflies: in addition to the species listed in Table 3:
- The Wall (or Wall Brown) (*Lasiommata megera*) known from the general area including the Site, and Small Heath (*Coenonympha pamphilus*), the caterpillars of which feed on a wide variety of grasses with a possible preference for *Festuca* species[32];
- Bumblebees, none of which has any recent records from the general area including the Site[33]; and
- Dragonflies, none of which has any recent records from the general area including the Site[34].

3.10.1.2 Constraints and Recommendations

The Design Code and Mini Masterplans should seek to retain and enhance or create habitats suitable for notable invertebrate species relevant to Essex and appropriate to the Site.

3.11 Notable Plants

3.11.1.1 Desk Study

The data search returned records of no plant species listed on Schedule 8 of the Wildlife and Countryside Act (1981) as amended from within the Survey Area in the last 10 years.

3.11.1.2 Constraints and Recommendations

Should any additional species of note be found on the Site, it is recommended that their proximity to the proposed works is assessed and if needed, reports produced addressing the protection and mitigation regarding these species. These reports may also result in changes to the work schedule and overall development and construction plans.

It is unlikely that notable plants will pose a significant constraint.

3.12 Invasive Non-Native Species

3.12.1.1 Desk Study

The data search returned no plant or animal species listed on Schedule 9 of the Wildlife and Countryside Act (WCA) (1981) (as amended) and the *Invasive Alien Species Order 2019 (IAS)*, within the Survey Area from over the last 10 years. Under the WCS and IAS , it is an offence to plant or otherwise cause these species to grow in the wild.

Neither examination of aerial photography nor use of Streetview identified any invasive non-native plants such as Japanese Knotweed (*Reynoutria japonica*) and Giant Hogweed (*Heracleum mantegazzianum*).

3.12.1.2 Constraints and Recommendations

All areas of the Site should be assessed for presence and, or absence of invasive non-native plant and animal species (INNS) in an initial scoping survey. This should be undertaken in the growing season from April to September.

If invasive non-native plant and animal species are present, an invasive non-native plant and animal species (INNS) management plan should be produced to deal with invasive non-native species during construction. Biosecurity measures would be taken to avoid the spread of invasive non-native species because of the development.

[32] Corke, D. (1997) The butterflies of Essex. Lopinga Books, Wimbish, Essex.
[33] Benton, E. (2000) The bumblebees of Essex. Lopinga Books, Wimbish, Essex.
[34] Benton, E. and Dobson, J. (2000) The dragonflies of Essex. Lopinga Books, Wimbish, Essex.

4. Biodiversity Enhancement

Although as an NDO scheme under the 2021 Environment Act, Part 2 Schedule 14[35], the NDO is exempt from the requirement to achieve biodiversity net gain, The Design Code, in support of policies such as the Basildon Local Plan Strategic Policy Enhancing Biodiversity and Green and Blue Infrastructure[36] which commits to delivering biodiversity net gain in all future developments in Basildon, will include recommendations to encourage net gains in biodiversity.

It is anticipated that the Design Code will be used to guide and control the detailed design of proposals as they come forward. All development within the proposed NDO must comply with the Design Code.

The Design Code for the development brought forward by the NDO will include biodiversity provisions in the Mini-Masterplans for each of the plots, examples of which include new tree planting, native hedgerows, enhanced wildlife ponds, bat and bird boxes, all of which would assist in delivering gains for biodiversity.

5. Conclusion

There are four sites designated for their biodiversity value within distances such that that they could be indirectly impacted because of the development brought forward by the NDO. This would primarily be due to the negative impact of increased recreation use of these sites by the new residents.

The desk study indicates that the Site has a relatively low biodiversity value although there are Habitats of Principal Importance within and adjacent to the Site that could be impacted by the Scheme. These are Deciduous Woodland, Traditional Orchards, hedgerows, ponds and a ditch. The Site has the potential to support several protected species including Badger, bats, Water Vole, Brown Hare, Harvest Mouse, birds including nesting birds, reptiles, Great Crested Newt and insects. Existing information on Badger in Essex suggests there could well be activity in the Site whereas a recent review of Great Crested Newt distribution did not report any from the Site or about 1 km around it. An initial scoping survey or surveys are recommended to further investigate the likely presence of these species on the Site.

Were any European protected species (bats, Water Vole, Great Crested Newt) and, or Badger to be present, mitigation licences may be required for the construction phase.

If invasive non-native species are present, an invasive non-native species management plan is recommended leading up to and during construction. This should include biodiversity measures to ensure that no invasive non-native species are inadvertently brought onto the Site as well as dealing with any found to be present on-site.

The development brought forward by the NDO will include mitigation measures and aims to achieve gains for biodiversity by installing species-specific habitat features, appropriate native planting, management regimes that encourage biodiversity and establishing a dark corridor or low lighting scheme design. The net outcome would be a gain in biodiversity.

[35] Department for Environment, Food and Rural Affairs (2022) Consultation on Biodiversity Net Gain Regulations and Implementation
[36] https://basildonlocalplan.commonplace.is/en-GB/proposals/enhancing-biodiversity-and-green-and-blue-infrastructure/start

Appendix A Relevant Legislation and Planning Policy

Legislation

The UK is no longer a member of the European Union (EU). EU legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation. EU legislation which applied directly or indirectly to the UK before 11.00 p.m. on 31 December 2020 has been retained in UK law as a form of domestic legislation known as 'retained EU legislation'.

The Secretary of State for the Environment, Food and Rural Affairs and Welsh Ministers have made changes to parts of the *Conservation of Habitats and Species Regulations 2017* (referred to as the 2017 Regulations*)* so that they operate effectively. Most of these changes involve transferring functions from the European Commission to the appropriate authorities in England. All other processes or terms in the 2017 Regulations remain unchanged and existing guidance is still relevant.

Designated Sites

Sites of Special Scientific Interest

Under the *Wildlife and Countryside Act 1981* (as amended), it is an offence to carry out or permit to be carried out any operations likely to damage a Site of Special Scientific Interest (SSSI). These operations are listed in each SSSI notification.

Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 of the *Wildlife and Countryside Act 1981* (as amended), before undertaking operations likely to damage a SSSI.

National Nature Reserve

National Nature Reserves (NNR) are established under the National Parks and Access to the Countryside Act 1949. Most NNRs are also underpinned by SSSIs and are therefore protected by the measures detailed above. For NNRs not underpinned by SSSIs it is still an offence to carry out or permit to be carried out any potentially damaging operation.

NNRs are given protection through policies in a local development plan.

Local Nature Reserve

A Local Nature Reserve (LNR) is a statutory designation made under National Parks and Access to the Countryside Act 1949, by principal local authorities (district, borough or unitary councils).

The local authority must control the LNR land – either through ownership, a lease or an agreement with the owner.

LNRs are given protection through policies in a local development plan.

Locally Designated Sites

Local Wildlife Sites are sites with 'substantive nature conservation value'. They are defined areas, identified and selected for their nature conservation value, based on important, distinctive and threatened habitats and species with a region.

They are usually selected by the relevant Wildlife Trust, along with representatives of the local authority and other local wildlife conservation groups.

The LWS selection panel, select all sites that meet the assigned criteria, unlike SSSIs, which for some habitats are a representative sample of sites that meet the national standard. Consequently, many sites of SSSI quality are not designated and instead are selected as LWSs. Consequently, LWSs can be amongst the best sites for biodiversity.

Protected Species

Badger

Badgers and their setts are protected under the *Protection of Badgers Act 1992* (as amended). This makes it an offence to wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett.

It is not illegal to carry out disturbance activities near setts that are not occupied, i.e. those that do not show signs of current use.

Where required, licences for development activities involving disturbance or sett interference or closure are issued by Natural England. Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process.

When assessing the requirement for a licence in respect of development, Natural England[37] state that badgers are relatively tolerant of moderate levels of noise and activity around their setts, and that a low or moderate level of apparent disturbing activity at or near to badger setts does not necessarily disturb the badgers occupying those setts.

Licences are normally not granted from December to June inclusive (the badger breeding season) because dependent cubs may be present within setts.

Bats / Great Crested Newt

Bats and Great Crested Newt, known as European Protected Species, are protected under Regulation 43 of the 2017 Regulations as amended by the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. This makes it an offence to deliberately capture, injure or kill an animal; deliberately disturb an animal; or damage or destroy a breeding site or resting place used by an animal.

Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing. Deliberate disturbance of animals includes any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

Where development works are at risk of causing one or more of the offences listed above, a mitigation licence from Natural England can be obtained to facilitate the works that would otherwise be illegal.

These species are also protected under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb an animal in such a place.

Lower levels of disturbance not covered by the *Conservation of Habitats and Species Regulations 2017* remain an offence under the *Wildlife and Countryside Act 1981* although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

Water Vole

Water voles are protected under the *Wildlife and Countryside Act 1981* (as amended). There are no licensing purposes that explicitly cover development or other construction activities which could have an impact on water voles.

When development work is proposed in or near an area which is either known to or likely to contain water voles, then the developer will need to implement suitable mitigation to prevent impacts to water voles. The preferred mitigation option is to leave water voles *in situ*, with the development works adopting avoidance measures through redesign of the proposals.

Where impacts cannot be avoided, operations aimed at displacing water voles from a development site are now no longer covered by the "*incidental result of an otherwise lawful action*" defence in the *Wildlife and Countryside Act 1981* (as amended). Displacement of water voles now needs to be undertaken under a licence.

In England, small scale (limited to continuous lengths of bank not exceeding 50 m) displacement of water voles can be carried out at certain times of the year (February to April) for the purposes of conservation under a Class Licence by a registered person. For larger scale displacements or displacements outside of this period, displacement can be undertaken under a site-specific conservation licence.

Where it is considered that the best outcome for water voles is capture and translocation to a different location then this action is considered by Natural England to be outside the scope of the defence as the intentional capture of water voles is unlikely to be considered 'incidental'. In these circumstances there may be genuine grounds for issuing a conservation licence for the purpose of translocating the water vole population to suitable alternative habitat.

[37] Interpretation of 'Disturbance' in relation to badgers occupying a sett, Natural England (2009)

Nesting Birds

All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended), with some species afforded greater protection under Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended). In addition to the protection from killing or taking that all birds receive, Schedule 1 birds and their young must not be disturbed at the nest.

There are no licensing purposes that explicitly cover development activities affecting wild birds.

Reptiles (common lizard, slow worm, grass snake and adder)

Reptiles are protected against intentional killing and injury under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended). There is no requirement for a licence where development works affect common species of reptiles. Instead, Natural England advise[38] that where reptiles are present, they should be protected from any harm that might arise during the development works through appropriate mitigation.

Species and Habitats of Principal Importance for the Conservation of Biodiversity

Section 40 of the *Natural Environment & Rural Communities Act (NERC) 2006* sets out the duty for public authorities to conserve biodiversity in England.

Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in Section 41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site.

The 'England Biodiversity List' is used as a guide for decision makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the NERC Act 2006 to have regard to the conservation of biodiversity in England when carrying out their normal functions.

Hedgerows

Under the Hedgerows Regulations 1997, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

Invasive Non-native Species

Under the *Wildlife and Countryside Act 1981 (as amended*) and the *Invasive Alien Species Order 2019*, it is an offence to plant or otherwise cause scheduled invasive non-native species to grow in the wild.

Any contaminated soil or plant material is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with section 34 of the *Environmental Protection Act 1990*.

[38]Reptiles: guidelines for developers, English Nature 2004

Planning Policy

National Planning Policy Framework, 2023

The NPPF was first published in March 2012 and has been updated in July 2018, February 2019, July 2021 and most recently in September 2023[39].

The latest update did not change the existing content but added policy about onshore wind development in England.

The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. It specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this it to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions. A summary of the paragraphs of the NPPF relevant to terrestrial ecology and nature conservation, and to the IERRT project, is provided below.

Paragraph 174 states that "*Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".*

Paragraph 175 states that "*Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries*."

Paragraph 179 states that "*To protect and enhance biodiversity and geodiversity, plans should:*

- *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- *promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity".*

Paragraph 180 states that "*When determining planning applications, local planning authorities should apply the following principles:*

[39] https://www.gov.uk/government/publications/national-planning-policy-framework--2

- *if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[40] and a suitable compensation strategy exists; and*
- *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.'*

Paragraph 181 states that *'The following should be given the same protection as habitats sites:*

- *potential Special Protection Areas and possible Special Areas of Conservation;*
- *listed or proposed Ramsar sites[41]; and*
- *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites. '*

Paragraph 182 states that '*The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.*'

Local Planning Policy

A summary of the relevant local planning policies in the Basildon Borough Revised Publication Local Plan 2014 – 2034 (October 2018) is provided in Table 4 below. For the precise wording of each specific policy please refer to the source document. This planning policy has been considered when addressing potential ecological constraints and opportunities identified by the desk study and field surveys and when addressing requirements for further survey, design option and ecological mitigation.

Table 6. Basildon Council Revised Local Plan Ecological Objectives

Strategic Objectives

SO1: Protecting and Enhancing the Quality of the Local Environment	Enhance the quality of the Borough's natural, historic and built environment through spatial planning and design, conservation of heritage assets and their setting, and the improvement of the character and appearance of its landscapes, including green corridors, to secure the future of the Borough's distinctiveness and sense of place.
	Protect, enhance, conserve, increase and positively manage the Borough's 18 biodiversity resources through the protection, enhancement, restoration and creation of habitats and green and blue infrastructure opportunities.
SO3: Minimise our Impact on the Environment	Promote the efficient use of resources by embracing sustainable patterns of development including maximising the use of previously developed land, improving energy and water efficiency, increasing the use of renewable energy technologies and minimising pollution including greenhouse gas emissions.
	Designing local environments so that they are of a high quality, more resilient to a changing climate and benefit from integrated environmental systems for drainage and waste management
Policy NE4 Development Impacts on Ecology and Biodiversity	1. Proposals which can demonstrate a resultant net gain in biodiversity will in principle be supported, subject to compliance with other relevant policies in this plan. 2. Proposals resulting in any direct adverse impacts to biodiversity within Ramsar sites, Special Protection Areas, potential Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest and Ancient Woodland will be refused unless it can be shown that there is an overriding public interest which necessitates that development occurring in that location.

[40] For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.
[41] Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

Strategic Objectives

3. Proposals resulting in indirect adverse impacts on sites with these designations, such as recreational disturbance, must be fully mitigated through a combination of on-site measures such as the provision of suitable alternative natural green space within the development site, and a financial contribution towards the measures set out in the Essex Coast Recreation Avoidance and Mitigation Strategy (RAMS). A management scheme must be put in place to ensure the on-going maintenance of any on-site mitigation measures.
4. Proposals which may result in adverse harm to other sites with local biodiversity interest, including those sites with protected species, priority species and/or priority habitats, will only be supported if they can meet the following requirements:
    a. It must be demonstrated that there is a need for the development proposed and harm to biodiversity cannot be avoided through locating the development on an alternative site with less harmful impacts;
    b. Where an alternative site is not available, the development proposal should seek to avoid adverse harm to biodiversity by virtue of the design and layout of the development. The Council must be satisfied that all reasonable opportunities to avoid harm to biodiversity have been taken;
    c. Where it has not been possible to avoid all harm to biodiversity, as required by a) and b), the development proposal should seek to apply management and mitigation techniques which retain and enhance biodiversity on site. The Council must be satisfied that all reasonable opportunities to secure on-site management and mitigation have been taken;
    d. Where it is likely that harm to protected species, or priority species is not fully addressed through a), b) and c), species translocation within the site, or to a suitable site nearby, in accordance with Natural England licences will be required to address the remaining harm to that species. The Council must be satisfied that the relocation site will provide a long-term suitable habitat for the species in question. A management plan must be put in place to manage the relocation site as a suitable habitat for a period of at least 20 years; then
    e. As a last resort, if the harm to biodiversity in terms of both quantity and quality have not been fully addressed through a), b), c) and d) off-site compensation which would result in a net gain in biodiversity will be required. A compensation site must be identified which has the potential to be broadly equivalent to that habitat being lost, and a management plan prepared. Arrangements must be put in place to deliver that plan over a period of at least 20 years.
5. Proposals affecting ecologically sensitive sites and designated sites should be accompanied by an ecological assessment which should conform with guidance set out by the Chartered Institute of Ecology and Environmental Management (CIEEM) or an equivalent standard. Where insufficient information is provided, the Council will take a precautionary approach to the protection of ecological assets