

A585 Windy Harbour to Skippool Improvement Scheme

TR010035

6.8 Environmental Statement Chapter 8: Biodiversity

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Planning Act 2008

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The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009

**A585 Windy Harbour to Skippool
Improvement Scheme**
Development Consent Order 201[]

ENVIRONMENTAL STATEMENT CHAPTER 8: BIODIVERSITY

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8 BIODIVERSITY

8.1 Introduction

8.1.1 This Chapter presents the biodiversity assessment of the Scheme. A desk study and field surveys, undertaken between 2014 and 2018, have been used to underpin this assessment. This Chapter presents the regulatory framework, assessment methodology, study areas, existing and future baseline, mitigation measures, residual effects, monitoring and a summary.

8.1.2 This Chapter should be read in conjunction with Figure 8.1: Biodiversity - Designated Sites, Figure 8.2: Biodiversity - Ecological Features, Figure 8.3: Biodiversity - Mitigation Areas and Figure 8.4: Biodiversity - Scheme Location, Survey Areas and Land Parcel Numbers together with Appendix 8.1: Extended Phase 1 Habitat Technical Appendix (document reference TR010035/APP/6.8.1), Appendix 8.2: Great Crested Newt Technical Appendix (document reference TR010035/APP/6.8.2), Appendix 8.3: Reptile Technical Appendix (document reference TR010035/APP/6.8.3), Appendix 8.4: Bird Technical Appendix (document reference TR010035/APP/6.8.4), Appendix 8.5: Bat Technical Appendix (document reference TR010035/APP/6.8.5), Appendix 8.6: Confidential Badger Technical Appendix (document reference TR010035/APP/6.8.6), Appendix 8.7: Otter Technical Appendix (document reference TR010035/APP/6.8.7), Appendix 8.8: Water Vole Technical Appendix (document reference TR010035/APP/6.8.8), Appendix 8.9: Biodiversity Metric Calculation (document reference TR010035/APP/6.8.9) and the Environmental Masterplan (document reference TR010035/APP/6.19).

8.1.3 In compliance with the Protection of Badgers Act 1992, all information related to badgers (*Meles meles*) (including survey methodology, baseline information, mitigation and residual effects and cumulative effects), is presented in Confidential Appendix 8.6 (document reference TR010035/APP/6.8.6). Release of Confidential Appendix 8.6 would only be to the Planning Inspectorate (the Inspectorate), and on request from suitably qualified professionals. Confidential Appendix 8.4 (document reference TR010035/APP/6.8.4) also provides sensitive information (including nest locations) relating to barn owl (*Tyto alba*), a species listed on Schedule 1 of the Wildlife and Countryside Act.

8.2 Regulatory Framework / National Policy Statement for National Networks (NN NPS) Requirements

8.2.1 This assessment has been undertaken considering current legislation, together with national, regional and local plans and policies. A list of plans is provided within Table 8-1 and further detail can be found in the Planning Statement and National Policy Statement Accordance (document reference TR010035/APP/7.1).

Table 8-1: Biodiversity – Regulatory Framework and NN NPS Requirements

Policy / Legislation
NN NPS (2014)
Conservation of Habitats and Species (amendment) Regulations 2010 ('Habitats Regulations')
The Wildlife and Countryside Act 1981 (as amended)

Policy / Legislation
Countryside and Rights of Way Act 2000
Natural Environment and Rural Communities ("NERC") Act 2006
Protection of Badgers Act (1992)
National Planning Policy Framework (NPPF) (2018)
National Planning Practice Guidance (NPPG) (various)
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services
The Highways Agency Environmental Strategy (2010)
Adopted Wyre Local Plan (1999)
Adopted Fylde Borough Local Plan (2005)
Fylde Local Plan to 2032 (emerging document – due to be adopted 2018)
Wyre Local Plan to 2031 (emerging document – due to be adopted 2018)
Fleetwood Thornton Area Action Plan (2009)

8.3 Methodology

Items Scoped in and out of the Assessment

8.3.1 The following ecological receptors have been scoped out in their entirety from this assessment:

- River Wyre (watercourse)
- Other (non-Section 41) habitats
- Protected and notable plant species (including fungi)
- Invasive flora
- Aquatic invertebrates
- Terrestrial invertebrates
- Reptiles
- Fish *spp*
- Other amphibian species (not including great crested newts)
- Hedgehog
- Brown hare
- Water voles

8.3.2 The receptors above were agreed to be scoped out in consultation with Natural England. Justification and evidence of agreement for this is outlined in Appendix 5.1: The Inspectorate's Scoping Opinion and Response (document reference TR010035/APP/6.5.1), Appendix 8.1: Extended Phase 1 Habitat (document reference TR010035/APP/6.8.1), Appendix 8.3 Reptiles (document reference TR010035/APP/6.8.3) and Appendix 8.8 Water Voles (document reference

TR010035/APP/6.8.8).

8.3.3 This chapter covers an assessment during both construction and operation on the following ecological receptors:

- Designated sites (including wintering and passage birds)
- Great crested newts
- Breeding Birds
- Schedule 1 Birds
- Bats
- Badgers
- Otters

Baseline Information

8.3.4 Baseline studies were completed between 2014 and 2018. The collecting of baseline survey information has been carried out in accordance with the steps set out in DMRB Volume 11, Section 3, Part 4, Ecology and Nature Conservation, Chapter 7. Baseline information has been gathered by:

- Identifying appropriate study areas
- Taking consideration of responses from consultees
- Undertaking desk studies
- Undertaking surveys within agreed study areas

Desk Study

8.3.5 A data search was undertaken for records of protected and priority species in the UK, locally important species of conservation concern and statutory and non-statutory designated sites of nature conservation interest. The Multi-Agency Geographical Information for the Countryside (MAGIC) website was used to search for statutory designated sites of nature conservation importance within 2km of the Scheme. The search buffer was extended to 30km for Special Area of Conservation (SAC) sites designated for bats. Desk study data was generated from a combination of freely available online data sources and the relevant local biological records centre (Lancashire Environmental Records Network (LERN)). Details of the desk study search areas are presented in Appendix 8.1: Extended Phase 1 Habitat Technical Appendix (document reference TR010035/APP/6.8.1).

Field Surveys

8.3.6 An extended Phase 1 habitat survey was undertaken which identified the habitats present on site and their potential to support protected species (flora / fauna) and to record any incidental observations thereby confirming presence of protected species. Following the completion of the extended Phase 1 habitat survey, targeted protected species surveys were recommended and subsequently carried out. A summary of the survey works undertaken has been provided in Table 8-2. Refer to Appendices 8.1–8.8 (document reference TR010035/APP/6.8.1 – 6.8.8) for full details of the methodologies applied.

8.3.7 The scope of the ecological surveys, as well as the survey methodologies have been

agreed in consultation with Natural England (refer to the Appendix 5.1: The Inspectorate's Scoping Opinion and Response (document reference TR010035/APP/6.5.1)).

Table 8-2: Biodiversity – Summary Baseline Survey Methodology

Survey	Date	Description	Appendix
Extended Phase 1 habitat and protected species walkover survey	April–September 2016	An extended Phase 1 habitat survey was undertaken to locate dominant or notable plant species. Note was taken of the more conspicuous fauna, and any evidence of, or potential for the presence of protected, notable or invasive species. The protected species survey comprised a search of the Scheme and adjacent areas to identify any habitats likely to be of conservation value, and to investigate the presence (or likely presence) of protected species of plants and/ or animals.	8.1 (document reference TR010035/APP/6.8.1)
Great crested newts	March–May 2017	Ponds within 500m of the draft order limits were surveyed using one, or a combination, of the following surveys: Habitat Suitability Index (HSI) assessment of all waterbodies, eDNA water sampling and / or traditional presence / absence surveys. Targeted presence / absence surveyed comprised 4 survey visits and where great crested newts were confirmed present; a further 2 survey visits were carried out to obtain a population density assessment. In line with the precautionary principle, where there was uncertainty relating to pond suitability, or where eDNA surveys yielded inconclusive results, presence/absence surveys were undertaken.	8.2 (document reference TR010035/APP/6.8.2)
Reptile surveys	April–October 2017	Habitat assessments were undertaken within 100m of the draft order limits. Presence/absence surveys within areas of potentially suitable reptile habitat.	8.3 (document reference TR010035/APP/6.8.3)
Breeding bird surveys	April–June 2017	Transect surveys of accessible land within the Survey Area to determine species assemblage, numbers of birds and patterns of habitat usage.	8.4 (document reference TR010035/APP/6.8.4)

Survey	Date	Description	Appendix
Wintering and passage bird surveys	September 2016–April 2017 and October 2017–April 2018	Weekly diurnal visits between mid-September and November during the autumn passage period in 2016 and 2017. Two diurnal surveys and 1 dawn or dusk survey per month between October and March 2016–17 and between October and March 2017–18 throughout the period that overwintering geese are active. Weekly diurnal visits between March and April (inclusive) in both 2017 and 2018 during the spring passage period.	8.4 (document reference TR010035/APP/6.8.4)
Bats	April–October 2017	Surveys of accessible tress and buildings to determine potential and actual bat roosts (6 structures (buildings) and 25 trees or groups of trees were assessed for bat roost suitability). The surveys were undertaken by licensed bat workers David Spencer (licence number 2015-13435-CLS-CLS) and Andrea Cordon (licence number 2016-25770-CLS-CLS). Surveys of bat foraging and commuting activity using transect and static monitoring surveys. Three transect routes were walked per month (April–October 2017, inclusive). Static monitoring was undertaken at 12 locations for a minimum of 5 consecutive nights per month (April–October 2017).	8.5 (document reference TR010035/APP/6.8.5)
Badger	April 2017	Surveys within 500m of the draft order limits for suitable habitats and field signs, including setts and evidence of foraging.	8.6 (document reference TR010035/APP/6.8.6)
Otter	April and August 2017	Survey of accessible watercourses and waterbodies within 500m of the draft order limits to determine habitat suitability, field signs and determine usage of habitats.	8.7 (document reference TR010035/APP/6.8.7)
Water vole	April and August 2017	Survey of accessible watercourses and waterbodies within 500m of the draft order limits to determine habitat suitability, field signs and determine usage of habitats.	8.8 (document reference TR010035/APP/6.8.8)

Post-Scoping and Preliminary Environmental Information Consultation

- 8.3.8 Further consultation has been undertaken since the receipt of the responses to the EIA Scoping Report and the Preliminary Environmental Information Report (PEIR) to agree a range of issues relevant to this Chapter, Table 3-1 of Chapter 3: Consultation (document reference TR010035/APP/6.3) provides full details.

Identifying Mitigation and Enhancement Measures and Assessing Residual Effects

- 8.3.9 The assessment methodology has been undertaken in accordance with Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 4 Ecology and Nature Conservation (Highways Agency, 1993) and Interim Advice Note (IAN) 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment (Highways Agency, 2010). Where appropriate, the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines have also been considered. In addition, the following guidance documents were taken into account in the survey and assessment process.

- Handbook for Phase 1 Habitats survey – a technique for environmental audit (Joint Nature Conservation Committee, 2010)
- Hedgerows Regulations Guidelines (1997)
- Great Crested Newt Mitigation Guidelines (Natural England, 2001)
- Bird Monitoring Methods: A Manual of Techniques for Key UK Species (Gilbert, *et al.*, 1998)
- Bat Survey: Good Practice Guidelines (Hundt 2012)
- Standing Advice Species Sheet: Eurasian Badger (Natural England, 2013)

- 8.3.10 When applying the assessment methodology, the hierarchical approach as set out in IAN 130/10 has been applied when considering resource valuation. In addition, professional judgement has been used in the: valuation of receptors; characterisation of effects; assessment of the likely success of mitigation measures to address these effects; and assessment of the likely residual effects after mitigation.
- 8.3.11 A biodiversity metric approach has been adopted and incorporated into the assessment. For further information, refer to Appendix 8.9 (document reference TR010035/APP/6.8.9).

Assessment Criteria – Sensitivity Criteria and Significance Threshold

- 8.3.12 In accordance with DMRB a Detailed Assessment has been carried out which identifies value and magnitude thresholds and considers the “Characterisation of Ecological Impacts” for each of the relevant receptors scoped into this assessment as well as providing an overall conclusion which states the significance of effects of the Scheme (in relation to those receptors). The assessment is based on the baseline survey information collated to date for the Scheme and considers both the construction and operation phase. Ecological receptors relevant to the Scheme were identified in the EIA Scoping Report. During the scoping process, resources were identified based on their value (see Table 8-3) and the potential for significant negative impacts to be sustained as a result of the Scheme. Professional judgement has also been used in combination with working alongside statutory bodies to ensure

all relevant resources / receptors have been identified.

- 8.3.13 The potential for significant effects of the Scheme on all scoped in receptors has been assessed. The assessment has taken into account the implementation of standard environmental measures. Where significant adverse effects were anticipated, the assessment presents additional mitigation measures that may be required in order to mitigate a significant adverse effect.
- 8.3.14 In addition, the potential need for mitigation for ecological receptors is identified in situations where a significant effect is not anticipated, but mitigation is warranted in order to address legislative requirements.
- 8.3.15 All mitigation and enhancement measures are presented in the Outline Construction Environmental Management Plan (CEMP) (document reference TR010035/APP/7.2), Record of Environmental Actions and Commitments (REAC) (document reference TR010035/APP/7.3), Environmental Enhancement Strategy appended to the Outline CEMP (document reference TR010035/AAP/7.2) and Environmental Masterplan (document reference TR010035/APP/6.19). These documents would be updated as and when during the Schemes life.

Determining the Importance of Ecological Features / Resource Valuation

- 8.3.16 In accordance with IAN 130/10, a hierarchical approach to the identification of resource valuation has been adopted, as presented in Table 8-3.

Table 8-3: Biodiversity – Resource Valuation / Geographical Scale of Importance (taken from IAN 130/10)

Resource Valuation (IAN 130/10)	
International or European Value	
	Natura 2000 sites including: Special Protection Areas (SPAs); potential SPAs (pSPAs); SACs; candidate or possible SACs (cSACs or pSACs); and Wetlands of International Importance (Ramsar sites).
	Biogenetic Reserves, World Heritage Sites and Biosphere Reserves.
	Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.
	Resident, or regularly occurring, populations of species which may be considered at an International or European level where: <ul style="list-style-type: none"> ▪ The loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; or ▪ The population forms a critical part of a wider population at this scale; or ▪ The species is at a critical phase of its life cycle at this scale.
UK or National Value	
	Designated sites including: Sites of Special Scientific Interest (SSSIs); Marine Protected Areas (MPAs) including Marine Conservation Zones (MCZs); and National Nature Reserves (NNRs).

Resource Valuation (IAN 130/10)

Areas which meet the published selection criteria e.g. JNCC (1998) for those sites listed above but which are not themselves designated as such.

Areas of key/priority habitats identified in the UK Biodiversity Action Plan (BAP), including those published in accordance with Section 42 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity.

Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory.

Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level where:

- The loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or
- The population forms a critical part of a wider population at this scale; or
- The species is at a critical phase of its life cycle at this scale.

Regional Value

A statutory designated site of Regional importance to nature conservation such as a National Park.

Regional valuation would also include key/priority habitats and / or species populations and assemblages identified as being of Regional importance, (i.e. value at the North West of England level, where available), in the appropriate Natural Area Profile (or equivalent); areas that have been identified by regional plans or strategies as areas for restoration or re-creation of priority habitats.

Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level and key/priority species identified at the regional level where:

- The loss of these populations would adversely affect the conservation status or distribution of the species at this scale; or
- The population forms a critical part of a wider population; or
- The species is at a critical phase of its life cycle.

Resource Valuation (IAN 130/10)
County or Unitary Authority Area Value
<p>Designated sites including: Sites of Importance for Nature Conservation (SINCs); County Wildlife Sites (CWSs); and Local Nature Reserves (LNRs) designated in the county or unitary authority area context.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent).</p> <p>Resident, or regularly occurring, populations of species which may be considered at an International, European, UK or National level where:</p> <ul style="list-style-type: none"> ▪ The loss of these populations would adversely affect the conservation status or distribution of the species across the County or Unitary Authority Area; or ▪ The population forms a critical part of a wider population; or ▪ The species is at a critical phase of its life cycle.
Local Value
<p>Designated sites including Local Nature Reserves (LNRs) designated in the local context.</p> <p>Trees that are protected by Tree Preservation Orders (TPOs).</p> <p>Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.</p>

8.3.17 Within this assessment, those features considered to be of local importance for biodiversity or greater, and which could be affected by the Scheme, have been identified as receptors. Effects on features of lower than local importance (site importance) for biodiversity have not been assessed, with the exception of those which warrant mitigation to ensure adherence to legislative requirements.

Characterisation of Ecological Impacts

8.3.18 Following the identification of relevant ecological receptors and the allocation of a resource value, the ecological impacts can then be characterised as identified in IAN 130/10. The characterisation assessment of ecological impacts include the following:

- The description of the resource including its nature conservation value (e.g. the value assigned to the resource as presented above in Table 8-3), the policy and legislative context, its integrity / conservation status (as defined in HD 44/09) and factors such as the resource being relevant to SSSI selection criteria (for example)
- The proposed activity, biophysical change, related to the receptor structure and function. This considers construction and operation phases in this

instance and any biophysical change (e.g. the changes to the resource as a result of the impact being sustained)

- The characterisation of the impact, whether significant positive or negative, the probability of it occurring, complexity, extent, size, reversibility, duration, timing and the level of frequency
- Mitigation proposals which includes details of the mitigation, quantification / measure and the means in which the mitigation would be implemented

8.3.19 Following on from the characterisation of ecological impacts, a summary has been produced identifying any residual impacts, whether significant or not significant and the confidence of the predications being made.

Significance of Effects

8.3.20 In accordance with DMRB and IAN 130/10 significance of effects is determined through the identification of significant impacts on ecological receptors at difference value levels (see Table 8-3) which then identifies an overall significance category. This determining of the significance of effects still relies on professional judgement and needs to be applied by those with sufficient professional experience. Table 8-4 demonstrates the categorisation of significance which can be applied to all assessed ecological resources / receptors, provides a comparison of the approach for ecology in accordance with IAN 130 / 10 when defining significance of impacts on ecological receptors.

Table 8-4: Biodiversity – Significance of Effects (taken from IAN 130/10)

Significance category	Typical Descriptors of Effect (Nature Conservation)
Very Large	An impact on one or more receptor(s) of Internal, European, UK or National Value. NOTE: only adverse effects are normally assigned this level of significance. They should be considered to represent key factors in the decision-making process.
Large	An impact on one or more receptor(s) of Regional Value. NOTE: these effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	An impact on one or more receptor(s) of County or Unitary Authority Area Value. NOTE: these effects may be important but are not likely to be key decision-making factors.
Slight	An impact on one or more receptor(s) of Local Value. NOTE: these effects are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project.
Neutral	No significant impacts on key nature conservation receptors. NOTE: absence of effects, or those that are beneath levels of perception.

8.3.21 Based on professional judgement an effect of moderate and above is considered to be 'significant' in terms of EIA.

8.3.22 Biodiversity units – a measure of ecological value – were calculated separately for existing baseline conditions and operation phase conditions. The units were determined using the metric calculation published by Highways England in April 2018

within Chief Highway Engineer Memorandum 422/18, hereafter referred to as the 'CHE Memorandum' (Highways England, 2018). Full details are provided in Appendix 8.9 (document reference TR010035/APP/6.8.9).

Assumptions and Limitations

8.3.23 Assumptions have been taken into consideration throughout the assessment and are outlined below. Survey specific assumptions and limitations have been set out in detail within each of the Appendices 8.1 – 8.8 (document reference TR010035/APP/6.8.1 – 6.6.8).

- The ecological surveys were agreed in consultation with Natural England and were considered to be representative and robust (based on best practice guidance at the time of completing the surveys)
- The desk study and survey information is considered to be sufficiently robust to inform the assessment
- Professional judgement has been used at all times (during surveys and throughout the assessment process). The approach has been to identify risks on the basis of the precautionary principle (i.e. a worst-case scenario)
- To present a worst-case scenario it has been assumed that the borrowpits would be used

8.4 Study Area

8.4.1 The study area was determined following the guidelines as set out in DMRB (specific references outlined in Table 8-5). The study area encompasses both the Desk Study Area and Survey Area for each receptor and has been determined by the receptors considered at the scoping stage to be confirmed as present (or potentially present) and through consultation with Natural England. Given the range of ecological resources present, the study areas vary. Table 8-5 identifies the study areas in relation to ecological receptors.

8.4.2 The Desk Study Area was larger than the Survey Area for each receptor as this provides context of each receptor's distribution in the wider landscape. Survey Areas encompassed the distance from the Scheme in which effects have the greatest likelihood occurring.

Table 8-5: Biodiversity – Study Areas and Survey Areas for Ecological Receptors

Ecological Receptor	Desk Study Area	Survey Area
Statutory Designated Sites	30km for SACs designated for bats. 2km for other statutory sites. Data search study area was in accordance with DMRB Volume 11, Section 4, Part 1 (Highways Agency, 2009)	N/A
Non-Statutory Designated Sites	1km	N/A
Protected and	500m	Phase 1 Habitat Survey:

Ecological Receptor	Desk Study Area	Survey Area
notable habitats		habitats up to 500m.
Great crested newts	1km Survey Area was decided in accordance with DMRB Volume 10, Section 4, Part 6 (Highways Agency, 2001) and Natural England Great Crested Newt Survey Guidelines (English Nature, 2001).	Great crested newt Habitat Suitability Index (HSI) assessment, presence / absence survey and environmental DNA (eDNA) survey: all waterbodies up to 500m.
Birds	1km	Habitat suitability assessment: up to 300m from the edge of the route corridor. Breeding bird and barn owl surveys: suitable nesting habitat up to 300m from the edge of the route corridor. Wintering birds: suitable habitats up to 500m from the route corridor: extended to include the Wyre Estuary to provide context to survey results (also extended south in 2016–17 to assess potential mitigation areas).
Bats	1km field survey study area was in accordance with DMRB Volume 10, Section 4, Part 3 (Highways Agency, 1999a) and Bat Conservation Trust (BCT) Guidelines (Collins, 2016).	Habitat suitability assessment: up to 500m. Bat roost inspection survey up to 100m activity survey (transect and static / automatic): suitable foraging / commuting habitat up to 100m.
Otter	1km field survey study area in accordance with DMRB Volume 10, Section 4, Part 4 (Highways Agency, 1999b).	Watercourses within 500m from the edge of the route corridor.
Badger	1km field survey study area in accordance with DMRB Volume 10, Section 4, Part 2 (Highways Agency, 1992).	500m from the edge of the route corridor.

8.5 Existing and Future Baseline

Existing Baseline

8.5.1 The section below summarise the existing ecological resources identified during the desk study and field surveys. Full details of the field survey results are presented in

Appendices 8.1 – 8.8 (document reference TR010035/APP/6.8.1 – 6.8.8).

Designated Sites

Morecambe Bay and Duddon Estuary SPA

8.5.2 Morecambe Bay and the Duddon Estuary qualifies as a SPA under Article 4.1 of the Directive 79/409/EEC (as now codified by Directive 2009/147/EC) by supporting populations of European importance of the following species listed on Annex I of the Directive: During the breeding season: Little tern (*Sterna albifrons*), Sandwich tern (*Sterna sanvicensis*), common tern (*Sterna hirundo*). Overwinter: Bar-tailed godwit (*Limosa lapponica*), golden plover (*Pluvialis apricaria*). This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: During the breeding season: Herring gull (*Larus argentatus*), Lesser black-backed gull (*Larus fuscus graellsii*). On passage: Ringed plover (*Charadrius hiaticula*), sanderling. Over winter: Little egret (*Egretta garzetta*), curlew (*Numenius arquata*), dunlin (*Calidris alpina*), ruff (*Calidris pugnax*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit, grey plover (*Pluvialis squatarola*), knot (*Calidris canutus*), oystercatcher (*Haematopus ostralegus*), pink-footed goose (*Anser brachyrhynchus*), pintail (*Anas acuta*), redshank (*Tringa totanus*), shelduck (*Tadorna tadorna*), turnstone (*Arenaria interpres*). During the breeding season, the area regularly supports 40, 672 individual seabirds. Over winter, the area regularly supports 266,751 individual waterfowl (5-year peak mean for 2009-10-2013/14).

8.5.3 Further consideration of the SPA has been provided in the A585 Windy Harbour to Skippool Habitat Regulations Assessment (HRA) (document reference TR010035/APP/5.4). Refer to Figure 8.1 for the SPA boundary.

Morecambe Bay Ramsar site

8.5.4 Morecambe Bay Ramsar site is designated for migratory waterfowl with ringed plover in internationally important numbers; assemblages of over-wintering waterfowl which are of international importance; and, populations of breeding, over-wintering and passage waterfowl also of international importance, including lapwing (*Vanellus vanellus*). The site supports the third largest population of wintering waterfowl in the UK.

8.5.5 Further consideration of the Ramsar site has been provided in the A585 Windy Harbour to Skippool Habitat Regulations Assessment (HRA) (document reference TR010035/APP/5.4). Refer to Figure 8.1 for the Ramsar site boundary.

SPA / Ramsar Site Bird Species

8.5.1 Desk study records confirmed the presence of SPA and Ramsar species within the search area detailed in Table 8-5 above. Habitat areas suitable for use by wintering birds associated with the SPA / Ramsar site have been confirmed as present during the targeted ecological surveys. Targeted bird surveys confirmed the presence of 16 SPA / Ramsar site species within the bird Survey Area. The majority of records were associated with the River Wyre, north of the Scheme. Of the 16 species, 4 were recorded in numbers above the 1% SPA/Ramsar site population within or adjacent to the Scheme (pink-footed geese, curlew, lapwing, and little egret). Refer to Appendix 8.4 (document reference TR010035/APP/6.8.4) for further information.

8.5.2 Sixteen Morecambe Bay and Duddon Estuary SPA / Ramsar site qualifying species

(designated for peak counts during the winter, on passage or both) were recorded during the passage and winter bird transect surveys over the 2 survey seasons. Cormorant, oystercatcher, shelduck, redshank, dunlin, black-tailed godwit, knot, red-breasted merganser, wigeon and ringed plover were all recorded. However, none of the records were above the 1% threshold during any of the bird surveys.

8.5.3 Birds which could make up the overwintering waterbird assemblage associated with Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site were also recorded throughout the winter surveys. A total of 41 species were recorded during the 2016–2017 surveys, and a total of 33 species were recorded during the 2017–2018 winter bird surveys, (refer to Appendix 8.4 (document reference TR010035/APP/6.8.4). The winter waterbird assemblage for the Morecambe Bay and Duddon Estuary SPA is cited as 266,751 birds (based on the 5-year peak mean 2009/10–2013/14) and the Morecambe Bay Ramsar site citation states 223,709 birds (based on the 5-year peak mean 1998/99–2002/03). Given that the SPA includes the most recent data for the region, it was considered appropriate to take 1% or greater of the SPA population as the threshold against which to assess the results.

8.5.4 Given that the SPA includes the most recent data for the region, it was considered appropriate to take 1% or greater of the SPA population as the threshold against which to assess the results: 1% of 266,751 equates to 2,667 birds.

8.5.5 The combined peak count of each species of waterbird present within 300m of the Scheme did not exceed 1% or greater of the SPA assemblage (i.e. 2,667 birds) during either the 2016–17 or 2017–18 winter bird surveys. The combined total of peak counts for the whole of the 300m buffer was 1,790 birds in 2016–17 and 1,374 birds in 2017-18 which equates to 0.67% and 0.52% of the SPA population respectively.

Wyre Estuary SSSI

8.5.6 The Wyre Estuary SSSI is designated for its ornithological interest, including wintering and passage black-tailed godwit, wintering turnstone and wintering teal (*Anas crecca*); and, intertidal habitats including saltmarsh.

The desk study identified 2 records of teal, 3 records of black-tailed godwit and 2 records of turnstone, all associated with the River Wyre or Skippool Creek. Targeted bird surveys confirmed the presence of 2 SSSI species within the Bird Survey Area – black-tailed godwit and teal. Black-tailed godwit are also a qualifying feature of the Morecambe Bay and Duddon Estuary SPA and are discussed in more detail above, therefore the results would not be repeated here. The majority of teal records were associated with the River Wyre, north of the Scheme although there were records of teal utilising inland habitats. The largest flocks identified utilising inland habitats during the bird surveys were within Land Parcels 23 (peak count: 93 birds), 24 (peak count: 25 birds) and 12 (peak count: 280 birds) either on or adjacent to ponds. The ponds associated within the teal records are all outside the draft order limits and would not be affected by the Scheme (refer to Appendix 8.4 - document reference TR010035/APP/6.8.4).

Wyre-Lune rMCZ

8.5.7 The Wyre-Lune rMCZ supports important populations of smelt (*Osmerus eperlanus*) and eel (*Anguilla Anguilla*), but is not yet designated.

- 8.5.8 The Wyre-Lune rMCZ is partially within the draft order limits, refer to Figure 8.1, designated sites.

Skippool Marsh and Thornton Bank BHS

- 8.5.9 The principal habitats of the Biological Heritage Site (BHS) comprise un-grazed saltmarsh and relict woodland. Of particular note are Lax-Flowered Sea-Lavender (*Limonium humile*), a nationally scarce plant, and a significant population of Wild Celery (*Apium graveolens*), a species which is included on the Provisional Lancashire Red Data List of Vascular Plants. The site measures approximately 9.05ha and partially overlaps with the Wyre-Lune rMCZ at Skippool Creek.

Shard Bridge Field Ditch BHS and River Wyre – Upper Tidal Section BHS

- 8.5.10 The BHS comprises a longitudinal hollow and ditch supporting saltmarsh vegetation which drains into the immediately adjacent River Wyre and Morecambe Bay SPA. It measures approximately 0.35ha, is flooded by saline water during very high tides and is notable for the occurrence of Long-Stalked Orache (*Atriplex longipes*), a nationally scarce plant. River Wyre – Upper Tidal Section BHS site comprises a tidal, 3km length of the River Wyre with associated mudflats, saltmarsh and grassland, extending to the boundary of the Wyre Estuary SSSI. It contains a variety of saltmarsh species and landward transition species. Two species on the Provisional Lancashire Red Data List of Vascular Plants occur in the BHS – Sand Leek (*Allium scorodoprasum*) and Common Meadow-Rue (*Thalictrum flavum*).

Protected or Notable Habitats

Coastal Saltmarsh and Mudflats

- 8.5.11 Areas of coastal saltmarsh and mudflats habitat associated with the River Wyre were identified to the north of the Scheme.

Coastal and floodplain grazing marsh

- 8.5.12 An extensive area of coastal and floodplain grazing marsh habitat was identified during the initial desk study and survey works. Coastal and floodplain grazing marsh habitat is particularly important for several breeding waders, such as lapwing and curlew, both of which are qualifying species of the Morecambe Bay and Duddon Estuary SPA and / or Morecambe Bay Ramsar site.

Rivers – Skippool Creek

- 8.5.13 Skippool Creek was semi-culverted and flows north into the River Wyre. The creek was surrounded by poor semi-improved grassland comprising species such as bramble (*Rubus fruticosus agg.*), common nettle (*Urtica dioica*), creeping thistle (*Cirsium arvense*), creeping bent (*Agrostis stolonifera*), cock's-foot (*Dactylis glomerata*) and hogweed (*Heracleum sphondylium*).

Deciduous Woodland

- 8.5.14 19.4ha of deciduous woodland was identified within the Survey Area as presented in Table 8-5 above also refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing). Woodland blocks were widespread within the Survey Area (refer to Table 8-5 above) but restricted to relatively small blocks primarily associated with agricultural fields.

Hedgerows

- 8.5.15 A network of hedgerows of total length 3.64km was interspersed throughout the Survey Area, refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing). Although these hedgerows were predominantly species-poor and dominated by Hawthorn (*Crataegus monogyna*), they met the criteria for Section 41 Hedgerow.

Ponds

- 8.5.16 Approximately 128 ponds, distributed widely throughout the Survey Area, were identified during habitat and amphibian surveys. Refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).

Rivers – Main Dyke

- 8.5.17 Main Dyke was a heavily-modified tributary of the River Wyre and was of moderate quality. It measures approximately 3m wide and was culverted beneath the existing A585 and A586 roads. Main Dyke contains very little emergent vegetation and was predominantly tree-lined. The banks (where accessible to livestock) were heavily grazed and poached. Refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).

Other Rivers

- 8.5.18 The other rivers Section 41 Habitat description includes a very wide range of types, encompassing all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in 'natural' systems). A network of small watercourses was interspersed throughout the study area; due to their small-scale, both individually and collectively, these watercourses have been included, collectively, under the other rivers habitat description.

Protected or Notable Species

Great Crested Newts

- 8.5.19 The desk study revealed 3 records for great crested newts (*Triturus cristatus*) dated 2005, the closest of which was 110m to the north of the Scheme. Forty ponds of greater than average suitability was identified. Terrestrial habitat quality was predominately poor, restricted to agricultural fields, although higher quality habitat was present in the form of hedgerows, scrub and woodland. Surveys confirmed the presence of small or medium populations of great crested newts in 10 ponds (N.B. ponds in which eDNA confirmed presence, but subsequent presence/absence surveys did not record great crested newts have been assumed to support a small population). Additionally, great crested newt presence was precautionarily assumed in P109 and P109A, to which access could not be obtained. Refer to Appendix 8.2 (document reference TR010035/APP/6.8.2) for further information.
- 8.5.20 Six ponds – P77, P68, P83, P109, P109A and P110 – are understood to form 1 metapopulation (hereafter 'metapopulation 1'). Four ponds – P12A, P14, P15 and P20 – are understood for form a second metapopulation (hereafter 'metapopulation 2'). Pond P7A is likely to be associated with metapopulation 2; however, this waterbody is located to the north of the existing A585 and located beyond 500m from metapopulation 2, although a native, species-poor intact hedgerow does provide a landscape feature which could be used for dispersal, providing habitat linkages. Pond P59 is located between the 2 metapopulations and therefore could be used by newts from either metapopulation. Direct loss of habitats

associated with this receptor would therefore occur.

Reptiles

8.5.21 The desk study revealed no records of reptiles. The habitats within the Scheme corridor were assessed as being generally of low suitability for use by foraging, hibernating and / or basking reptiles. The targeted reptile surveys that were undertaken along the Scheme corridor confirmed that reptiles were absent. This information was used to inform the decision to exclude reptiles from detailed assessment. Refer to Appendix 8.3 (document reference TR010035/APP/6.8.3) for further information.

Breeding Birds (Schedule 1 species)

8.5.22 The desk study confirmed records of 5 Schedule 1 species, including barn owl, green sandpiper, hen harrier, kingfisher and peregrine. Surveys identified habitat suitable for barn owl, and kingfisher within and adjacent to the Scheme. Habitat suitable for green sandpiper, hen harrier and peregrine were present within the wider Bird Survey Area.

8.5.23 Targeted surveys identified barn owl foraging adjacent to the Scheme. Two potential nesting/ roosting locations identified within the Bird Survey Area, the closest being approximately 240m to the south of the Scheme. Kingfisher were recorded on 3 occasions. However, these were all recorded during the winter and no breeding records of kingfisher were revealed as part of the desk study. Peregrine were recorded on 2 occasions in 2018 (March and April) with the closest record 270m north of the Scheme. Green sandpiper and hen harrier were both only recorded on a single occasion, outside of the breeding season and over 700m away from the Scheme. Refer to Appendix 8.4 (document reference TR010035/APP/6.8.4).

Breeding Birds (other notable species)

8.5.24 The desk study search revealed records of Red and Amber listed Birds of Conservation Concern within the Desk Study Area. Habitat suitable for use by breeding farmland species within and adjacent to the Scheme was also identified.

8.5.1 Targeted surveys confirmed the presence of 26 other notable bird species of nature conservation importance, including a number of species listed on the Red List of the Birds of Conservation Concern (RSPB list of priority species) and as priority species under Section 41 of the NERC Act 2016) were recorded during the breeding bird transect surveys. Refer to Appendix 8.4 (document reference TR010035/APP/6.8.4) for further information.

Bats

8.5.2 Desk study records revealed 39 records of numerous bat species, including:

- Noctule (*Nyctalus noctula*) - 2 records from 2002. Closest record was 155m south of the Scheme.
- Common pipistrelle (*Pipistrellus pipistrellus*) - 14 records between 2005 and 2011. Closest record was 155m south of the Scheme.
- Soprano pipistrelle (*Pipistrellus pygmaeus*) - 12 records between 1998 and 2012. Closest record was 155m south of the Scheme.

- *Myotis* spp. – 19 records of Daubentons' bat (*Myotis daubentonii*), the closest of which was 180m south west of the Scheme.

- 8.5.3 Twenty-five trees were identified as having more than negligible bat roost potential, of which 21 trees were identified as being of low suitability for use by roosting bats. Four trees were identified as being of moderate suitability for use by roosting bats. Subsequently, further targeted surveys were carried out. No signs indicating the use, or occupancy of any identified potential roosting features was identified. Therefore, at the time of survey the absence of roosting bats was assumed.
- 8.5.4 Five structures were identified as having low, medium or high bat roost potential. Foraging and commuting habitat was of moderate suitability due to a mosaic of agricultural fields, hedgerows and woodland interspersed throughout the Survey Area.
- 8.5.5 Common pipistrelle roosts were confirmed present in buildings B2, B3 and B4, (refer to Figure 8.5.3, (document reference TR010035/APP/6.8.5)). Each building contained small common pipistrelle roosts with peak counts of 6, 2 and 4 bats, respectively.
- 8.5.6 Targeted bat activity surveys recorded low levels of foraging and commuting activity along the Scheme corridor of noctules, Nathusius pipistrelles (*Pipistrellus nathusii*), soprano pipistrelles, *Myotis* spp. and brown long-eared (*Plecotus auritus*) bats. Moderate levels of common pipistrelle activity were recorded. The hedgerow and tree line boundaries of the residential properties to the north of the A585 as well as the copse adjacent east of the B2560 were the locations identified supporting the majority of bat activity. Refer to Appendix 8.5 (document reference TR010035/APP/6.8.5) for further information.

Otters

- 8.5.7 The desk study revealed no records of otters (*Lutra lutra*). The watercourses along the Scheme corridor were generally of low suitability for otter, with the exception of Main Dyke and Drain 29 (Figure 8.7.1 (document reference TR010035/APP/6.8.1)). The targeted surveys noted limited opportunities for otter resting sites or natal holts. However, on Main Dyke, 1 potential otter holt was initially identified to the south of the Scheme. Further monitoring confirmed that the potential holt regularly flooded and therefore was not suitable to support breeding otters.
- 8.5.8 No natal holts or resting sites were confirmed as present during the targeted surveys. However, evidence of otters was identified at several locations along the Scheme corridor. Otter prints, and spraint was found at Mains Lane Bridge and Main Dyke. Otter prints were also found under the junction of Garstang Road East. Further signs of otters were identified at Drain 29 where spraint and prints were found as well as a potential otter run.

Water Voles

- 8.5.9 The desk study revealed no records of water voles (*Arvicola amphibious*). The targeted surveys found the watercourses along the Scheme corridor as being generally of low suitability for use by water voles. Although 5 watercourses were identified as being suitable for use by water voles, no evidence of water vole was recorded during the targeted surveys. Therefore, it is considered likely that water voles are absent from the Survey Area. Refer to Appendix 8.8 (document reference

TR010035/APP/6.8.8) for further information.

Badgers

- 8.5.10 The desk study revealed no records of badgers (*Meles meles*). Surveys found the habitat conditions along the Scheme corridor as being broadly suitable for foraging, but with limited habitat opportunities to support a Main sett. Badger setts were recorded at 2 locations within the Survey Area. A single entrance, disused outlier sett was identified under the Scheme footprint in a drainage ditch parallel to the western edge of Carr Wood, south of Mains Lane. A main sett with 3 active entrance holes in a drainage ditch north of Mains Lane, adjacent to the western edge of River Wyre Caravan Park, 35m from the Scheme at the nearest point. Refer to Confidential Appendix 8.6 (document reference TR010035/APP/6.8.6) for further information.

Future Baseline

- 8.5.11 Construction is not scheduled to begin until Spring 2020. Due to the period of time between the start of construction and the date on which baseline surveys were undertaken it is important to consider future baseline conditions. Notably it is important to assess whether in the period prior to construction the status and distribution of ecological receptors may change and the whether such change could render predicted impacts, as considered in this assessment, ineffective.
- 8.5.12 The Survey Area, predominantly an arable mosaic, would be subject to routine agricultural practices. Aside from the variation due to these practices it is considered unlikely that the habitats within the Survey Area would vary substantially prior to construction; consequently, it is considered unlikely that the status or distribution of receptors within the Survey Area would vary to an extent which would qualitatively alter conclusions drawn in this assessment. Similarly, it is considered unlikely that additional ecological features not currently considered in this assessment would vary to the extent that significant impacts upon them would be considered likely.
- 8.5.13 A new housing development is currently under construction at Moorfield Park (shown on Figure 2.1, document reference TR010035/APP/6.2). It is anticipated that, based upon disturbance distances as discussed further in Section 8.7, foraging and roosting wildfowl and waders would be displaced up to 300m from the development during the construction phase. As such, the fields to the north of Garstang Road East would become subject to disturbance during the construction period of the housing development and therefore, the suitability of the fields that would be affected by the Scheme would be reduced. It is considered unlikely that the large flocks of curlew, lapwing and pink-footed goose would use this area during the construction phase of the adjacent housing development and as a result would not be subject to further disturbance or displacement as a result of the Scheme.
- 8.5.14 Whilst it is anticipated that other baseline features would remain unchanged, further surveys would be undertaken prior to construction to maintain future validity (for examples, re-assessing the status of bat roosts and badger setts, as set out within Section 8.6).

Receptors Potentially Affected (including value / sensitivity)

- 8.5.15 Table 8-6 identifies ecological features that are anticipated to be affected by the Scheme. The table below also assigns a level of value / sensitivity to the receptors.

Table 8-6: Biodiversity – Ecological Receptors Scoped in to the Detailed Assessment

Receptor	Value / Sensitivity	Potentially Significant Effect
Morecambe Bay and Duddon Estuary SPA and Ramsar Site (pink-footed geese, lapwing, curlew and little egret)	Valued as being of International importance.	Potential impacts associated with construction phase activities. Particularly the construction phase activities, disturbance, loss of foraging habitat and changes in water quality. Refer to Appendix 8.4 (document reference TR010035/APP/6.8.4)
Wyre Estuary SSSI	Valued as being of National importance.	Although outside of the working area, potential for indirect effects upon the SSSI qualifying features.
Wyre-Lune rMCA	Valued as being of National importance.	Partially within the draft order limits. Refer to Figure 8.1.
Skippool Marsh and Thornton Bank BHS	Valued as being of Regional importance.	The Skippool Marsh and Thornton Bank BHS is partially within the draft order limits, the same location as described for the Wyre-Lune rMCZ. Refer to Figure 8.1.
Shard Bridge Field Ditch BHS and River Wyre – Upper Tidal Section BHS	Valued as being of Regional importance.	The Shard Bridge Field Ditch BHS and River Wyre – Upper Tidal Section BHS is located within the vicinity of the Scheme but not within the footprint. Refer to Figure 8.1.
Coastal Saltmarsh and Mudflats	Valued as being of Regional importance.	Coastal saltmarsh and mudflats are located within the vicinity of the Scheme.
Rivers- Skippool Creek	Valued as being of County importance.	Skippool Creek passes beneath the western extent of the Scheme.
Deciduous woodland	Valued as being of Local importance.	Permanent loss of 6,287m ² of woodland. Refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).
Hedgerows	Valued as being of Local importance.	Temporary loss of 2,091m of hedgerows.

Receptor	Value / Sensitivity	Potentially Significant Effect
		<p>Permanent loss of 4,221m of hedgerow. Refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).</p>
Rivers – Main Dyke	Valued as being of Local importance.	<p>Potential impacts associated with construction works.</p> <p>Refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).</p>
Other rivers S41 Habitat (unnamed tributaries off Main Dyke and small field drains/steams)	Valued as being of Local importance.	<p>The Scheme would require 9 watercourse crossings, of which 5 would incorporate a safe crossing point for use by otters.</p> <p>Refer to Environmental Masterplan (document reference TR010035/APP/6.19).</p> <p>Works could cause direct physical loss, damage and fragmentation. Accidental spills of chemicals and other potentially toxic substances during the construction phase.</p>
Ponds	Valued as being of Local importance.	<p>Six ponds would be lost during construction of the Scheme. Three ponds would be lost temporarily during construction: P11, P62A, P62: the 3 remaining ponds would be permanently lost: P11A, P61 and P65 (document reference TR010035/APP/6.8.2), also refer to Appendix 8.1 (document reference TR010035/APP/6.8.1, the Phase 1 habitat survey drawing).</p>
Great crested newts	Valued as being of Local importance.	<p>No ponds known to support breeding great crested newts would be lost as a result of the Scheme. However, negative effects in terms of loss of terrestrial habitat and incidental mortality could still occur during the construction phase (document reference TR010035/APP/6.8.2).</p>
Wintering birds associated with	Valued as being of International	Indirect effect associated with the construction phase of the Scheme

Receptor	Value / Sensitivity	Potentially Significant Effect
Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site/Wyre Estuary SSSI (pink-footed geese, lapwing, curlew and little egret)	importance	(disturbance/displacement, loss of foraging habitat and changes in water quality) (document reference TR010035/APP/6.8.4).
Breeding birds (Schedule 1 – barn owl)	Valued as being of County importance.	Indirect effect associated with the construction phase of the Scheme (disturbance/displacement) (document reference TR010035/APP/6.8.4).
Breeding birds (other notable species)	Valued as being of Local importance.	Loss of nesting sites through vegetation clearance. Disturbance during breeding season.
Bats	Valued as being of Local importance.	Loss of confirmed bat roosts in Building B2 and Building B4 and other potential roosting sites and foraging habitat / commuting routes (document reference TR010035/APP/6.8.5).
Otters	Valued as being of County importance.	Disturbance/ displacement during the construction phase (document reference TR010035/APP/6.8.7).
Badgers	Valued as being of Local importance.	Badgers are highly mobile species and the establishment of new setts prior to the start of construction is possible. A pre-construction badger survey would be undertaken not more than 6 months prior to the start of construction, the purpose of which would be to identify any localised constraints or licencing requirement relating to newly established and to check if the disused outlier sett is active.

8.6 Mitigation and Enhancement Measures

Construction Phase Mitigation

- 8.6.1 New woodland planting would be implemented during the construction phase of the Scheme to mitigate for the permanent loss of 6,287m² of deciduous woodland. New woodland planting is shown on the Environmental Masterplan (document reference TR010035/APP/6.19) and is proposed along both sides of the new carriageway, Sheets 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14. The new woodland areas would be planted during the construction phase and would continue to establish during the operation of the Scheme.

- 8.6.2 Hedgerows scheduled for temporary loss (as shown on the Environmental Masterplan (document reference TR010035/APP/6.19)) during construction would be reinstated and, where appropriate, would be improved from their baseline condition: defunct or species-poor hedges would be replanted so as to achieve species-rich and continuous hedgerows, once re-established. A buffer of 10m (where practicable) would be retained around hedgerows to reduce any potential direct or indirect impacts on the species and habitats associated with them. Temporary fencing would be installed to demarcate root protection zones and to ensure no construction activities or site personnel enter into these areas.
- 8.6.3 To mitigate for the permanent loss of hedgerows (as shown on the Environmental Masterplan (document reference TR010035/APP/6.19)) under the completed Scheme, new linear planting would be incorporated into the landscape design. New planting is proposed along both sides of the new carriageway, refer to the Environmental Masterplan (document reference TR010035/APP/6.19, Sheets 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14). The planting works to be undertaken during the construction phase when areas become available, would also aim to improve the ecological value of the Highways England soft estate in the vicinity of the Scheme. Where possible, this would include reinstating and re-linking severed linear wildlife corridors. Planting mixes would be supplied from local sources and comprise native species of local provenance. The Scheme would be subject to a 5-year aftercare period.
- 8.6.4 Ponds removed temporarily during construction (as shown on Figure 8.2) would be reinstated prior to Scheme becoming operational within the same locations. Reinstated ponds would be returned to a condition of ecological value equal to or above that identified during baseline surveys. In the event that a pond cannot be reinstated in close vicinity to its baseline location, an alternative location would be identified. Three new ponds would be created within the central section of the Scheme to mitigate for the 3 ponds permanently lost beneath the footprint of the Scheme.
- 8.6.5 Mitigation measures would be incorporated into the Scheme design to ensure the protection of water quality during both the construction and operational phases of the Scheme. In particular, attention would be paid to ensuring protection of water quality during construction at the location of the new bridge crossing of the Main Dyke (at the western end of the Scheme) which flows directly into the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. In the locations of the 9 new watercourse crossings, refer to the Environmental Masterplan (document reference TR010035/APP/6.19), a Pollution Control Plan would be implemented during the construction phase (a draft has been prepared as part of the Outline CEMP (document reference TR010035/APP/7.2). This would include measures such as best practice construction site drainage management and pollution prevention measures in line with CIRIA guidance. During the operational phase, best practice pollution prevention and control measures would be implemented to ensure storm water runoff or accidental spillages from road traffic accidents (RTAs) do not adversely affect nearby habitats and species. More detail can be found in Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12).
- 8.6.6 The Scheme would require 9 watercourse crossings, refer to the Environmental Masterplan (document reference TR010035/APP/6.19, Sheets 2 and 5). Disturbance

to habitats within and directly adjacent to the ditch crossing points would be minimised, wherever possible. Where practicable, a buffer of up to 10m would be maintained to either side of the ditches to reduce any potential direct or indirect impacts on species and habitats associated with them. Areas of temporary habitat loss at the crossings during the construction phase would be reinstated prior to the Scheme becoming operational. Reinstated ditches would be returned to a condition of ecological value equal to or above that identified during baseline surveys.

- 8.6.7 During the construction phase of the Scheme, an area of temporary, alternative habitat would be provided to mitigate for disturbance / displacement of pink-footed geese, lapwing and curlew. Fields to the west of Shard Road (Figure 8.3 – Mitigation Areas), would be temporarily managed to provide suitable habitat for foraging pink-footed geese, lapwing and curlew as mitigation for disturbance / displacement to birds utilising fields within Survey Areas 2 and 5 (refer to Figure 8.4 and Appendix 8.4 (document reference TR00135/APP/6.8.4) for the survey areas). A Bird Mitigation Strategy for this area is provided as an appendix to the Outline CEMP (document reference TR010035/APP/7.2). The specific details of the Bird Mitigation Strategy are still to be finalised in consultation with Highways England and the landowner/tenant farmer. The Strategy would include measures such as supplementary feeding (pink-footed geese only); preventing dog walkers from Wyre Way entering the mitigation area, maintaining the open aspect of the fields; crop management; scrub removal around existing wet features to improve their suitability for waders (curlew and lapwing) and the creation of new scrapes (curlew and lapwing).
- 8.6.8 Construction works would be phased to allow the most sensitive sections of the Scheme to be constructed outside of the winter months. In addition, timing the works so as to avoid sensitive periods, for example, avoiding particularly loud activities at high tide when birds are more likely to be utilising inland habitats, ensuring top soil stripping is undertaken outside the winter period where possible and avoiding night-time working would be required.
- 8.6.9 Any vegetation removal would be undertaken outside of the bird breeding season (where possible) to avoid potential impacts on nesting birds. If vegetation clearance is required within the bird nesting period, all such vegetation would be checked by an ecologist for the presence of nesting birds no more than 48 hours prior to clearance. Wherever nests are found, a cordon of approximately 15m would be placed around the nest and no works would be permitted within that area until the chicks have fledged or confirmation from a qualified ecologist that work can proceed.
- 8.6.10 Mitigation for any works to be carried out that would impact upon great crested newts has been agreed in principle with Natural England. A draft European Protected Species Licence (EPSL) has been issued to Natural England and a 'Letter of No Impediment' has been sought. Mitigation agreed with Natural England includes habitat manipulation, destructive searches, temporary 1-way amphibian fencing, tool box talks, extensive habitat creation and enhancements as well as an improvement in the quality of ponds along the Scheme corridor through the replacement and reinstatement of 6 ponds, refer to Appendix 8.5 (document reference TR010035/APP/6.8.5), Figure 8.2 and the Environmental Masterplan (document reference TR010035/APP/6.19), Sheets 6 and 7 for pond locations.
- 8.6.11 The Scheme would require the removal of 4 trees with moderate bat roost potential

and 21 trees of low potential for use by roosting bats, all of which have been subject to targeted surveys and the absence of roosting bats confirmed at the time of writing. In order to accommodate the Scheme, there would be the loss of 2 confirmed pipistrelle bat roosts located within buildings B2 and B4 (as shown on Figure 8.2 and outlined in Appendix 8.5 (document reference TR010035/APP/6.8.5). Mitigation for the demolition of buildings B2 and B4 has been agreed in principle with Natural England. A draft EPSL has been issued to Natural England and a 'Letter of No Impediment' has been sought.

- 8.6.12 Mitigation in the draft EPSL includes sensitive timings of works: destruction of the roost to be undertaken November – February; bat roosts would be demolished using standard capture and exclusion (i.e. soft strip with a licensed bat worker present); mitigation for B2 would include the provision of 6 bat boxes in 2 groups of 3, incorporated into the new Shard Bridge structure, close to the site of the original roost; mitigation for B4 would include the provision of a bat barn in close proximity to the location of the original roost; dark corridors would be maintained alongside landscape planting around mitigation for either roost. The bat boxes and bat barn would be constructed prior to the demolition of the respective roosts for which they are proposed mitigation.
- 8.6.13 Potential roost features to be lost (i.e. tree with bat roost suitability) would be replaced on a 2:1 ratio; therefore, for each potential roost feature removed, 2 bat boxes would be installed on existing trees within the scheme corridor. Birds frequently occupy bat boxes, but this can be reduced by the installation of bird boxes close to bat boxes. Therefore, for each bat box installed, an equivalent number of bird boxes would also be installed at the same location, where feasible. Full details relating to bat and bird box specifications and locations are provided in the REAC (document reference TR010035/APP/7.3).
- 8.6.14 Works close to the other confirmed bat roost (building B3) should, where possible, avoid the core active season for bats (May – September) to ensure no disturbance to the confirmed roost. Construction-phase lighting would be designed to avoid light-spill to such areas; monitoring would be undertaken by the Ecological Clerk of Works (ECoW), during construction.
- 8.6.15 Culverts suitable for use by otters would be installed at the 5 new watercourse crossing points; a ledge suitable for otter will also be incorporated into the design for the works to Shard Bridge, refer to the Environmental Masterplan (document reference TR010035/APP/6.19), Sheets 2, 4, 5, 6, 7 and 12. Each culvert would be equipped with a galvanised steel ledge, with a non-slip surface, suitable for use by otter during periods of high water-flow. Culvert size and ledge height was determined to ensure each ledge would remain above water level during a 1:50 year flood event. Detailed specification for each culvert is provided in Scheme Drainage Strategy which is appended to the Flood Risk Assessment (document reference TR010035/APP/5.2). The watercourse crossing identified on Sheet 7 would comprise an adjacent dry pipe as there is insufficient vertical alignment to install a ledge that would be fit for purpose. Otter-proof fencing (adhering to Highways Construction Detail H48) would be installed from the entrance of each culvert, either side of the Scheme for a distance of 100m in each direction tying into suitable boundary features.
- 8.6.16 One disused outlier sett would be lost as result of the Scheme. In order to avoid

impacts on the local badger population (and to ensure legal compliance with the Badger Act, 1992), pre-construction badger surveys would be undertaken to determine if any new setts have established since the baseline surveys, and therefore determine if a licence would be required from Natural England.

- 8.6.17 Other badger setts were located in the vicinity of the Scheme. Although the setts would be avoided, mammal tunnels would be installed to ensure habitats and territories are not fragmented by the Scheme. Three mammal tunnels would be installed along the Scheme corridor in close proximity to either a badger sett or territorial marker (i.e. latrines), refer to the Environmental Masterplan (document reference TR010035/APP/6.19), Sheets 4 and 5. Each tunnel would comprise a Class M 600mm diameter concrete pipes following DMRB standard specifications. Badger-proof fencing would also be installed (adhering to Highway Construction Detail H47). Fencing would extend 500m in either direction from a mammal tunnel on both sides of the road. Requirements for badger fences and other fences overlap at various stretches along the Scheme. In these areas a single fence meeting the requirements of both receptors would be installed.
- 8.6.18 Construction-phase lighting would be designed to avoid light-spill to badger setts and territory markers; monitoring would be undertaken by the ECoW where necessary, construction hours have been stipulated to ensure bats are not perturbed from exiting roosts to forage or disperse to alternative roost sites.
- 8.6.19 To assist with the implementation of the mitigation and monitoring of the Scheme, an ECoW would be employed during the construction phase of the Scheme and would be supported with the appropriate specialist ecologists. This individual would be responsible for overseeing the works, ensuring the mitigation measures are implemented, and liaising with statutory and non-statutory organisations in relation to the environmental aspects of the Scheme during construction.

Operational Phase Mitigation

- 8.6.20 The new ponds would be maintained during the operation of the Scheme and would further increase habitat quality with the study area and habitat connectivity on either side of the Scheme. Refer to the Environmental Masterplan (document reference TR010035/APP/6.19, Sheets 6, 7 and 11).
- 8.6.21 The 3 ponds scheduled to be permanently lost would be compensated for with ponds of equal number, size and quality (or better) created at both the western and eastern extents of the Scheme. Therefore, the new ponds would result in no net loss and as the proposed designs would be to create larger ponds there should be an overall improvement in the condition of waterbodies created compared to those lost in the long-term.
- 8.6.22 The ponds and specifically the terrestrial habitat to be incorporated across the Scheme represents an increase of suitable great crested newt habitat within the Survey Area in the long-term, above baseline levels, given the current sub-optimal habitat conditions present.
- 8.6.23 New ditches totalling a length of 6,742m would be installed along the length of the Scheme therefore representing substantial increase of this habitat type in the long-term.
- 8.6.24 Landscape planting and bunding would be installed along the completed road Scheme as shown on the Environmental Masterplan (document reference

TR010035/APP/6.19) to help screen visual disturbance to birds utilising adjacent habitats.

- 8.6.25 The lighting Scheme has been designed to minimise light spill onto adjacent habitats. During the construction phase, lighting would be directional and kept to a minimum. During the operational phase, lighting of the Scheme would be designed to minimise light spill and would be restricted to junction areas where the carriageway needs to be lit for health and safety considerations. Therefore, lighting would only be installed at junctions along the Scheme and baffles would be fitted to ensure lighting remains directional and the surrounding landscape remains unlit.
- 8.6.26 Extensive landscape planting has been incorporated into the Scheme design. This would increase connectivity of hedgerow and woodland habitats on either side of the carriageway and is considered to represent an overall enhancement of hedgerow connectivity above baseline levels during the operational phase.
- 8.6.27 All mitigation commitments are incorporated into the REAC (document reference TR010035/APP/7.3). Fulfilment of the mitigation measures would be secured under Requirement 4 in the draft DCO (document reference TR010035/APP/3.1).

Enhancement

- 8.6.28 Enhancement measures are those which are over and above the measures which have been implemented to mitigate for potential impacts on the Scheme. The Biodiversity Metric calculates the biological gains associated with implementing the mitigation for the Scheme (incorporating biodiversity, landscape and drainage mitigation) (document reference TR10035/APP/6.8.9).
- 8.6.29 Biodiversity units, calculated separately for non-linear (Table 8-7) and linear (Table 8-8) habitats, are a measure of the ecological value of different habitat types; the calculation takes consideration of the distinctiveness, condition and area (or length) of current and predicted future habitats. Consideration of the duration between habitat reinstatement, or creation, works and the time at which a proposed habitat condition (i.e. quality) would be achieved; as well as the level of difficulty (or risk) associated with creating or reinstating each habitat type.
- 8.6.30 Biodiversity units for baseline and operation phase conditions demonstrated a substantial increase in the number of units in the Scheme's operation phase (Table 8-9). Habitats reinstated in areas of temporary habitat loss or implemented as mitigation for permanent habitat loss would be more specious than baseline habitats and would be maintained in better condition than existing habitats (refer to Appendix 8.9 (document reference TR010035/APP/6.8.9).

Table 8-7: Biodiversity – Metric Calculation Results (Non-linear)

Condition	Phase 1 habitat description	Biodiversity units			
		Before works	After works	Difference	Percentage Change
Good	Broad-leaved plantation woodland	8.52	24.00	15.48	181.69
	Cultivated / disturbed land	37.80	27.55	-10.25	-27.12
	Standing Water	0	7.10	7.10	N/A
	Swamp	0	7.46	7.46	N/A
Moderate	Marsh / Marshy grassland	0	0.06	0.06	N/A

Condition	Phase 1 habitat description	Biodiversity units			
		Before works	After works	Difference	Percentage Change
	Poor semi-improved grassland	10.32	0	-10.32	-100.00
	Standing Water	3.00	0	-3	-100.00
	Semi-improved neutral grassland	0	87.20	87.2	N/A
	Dense continuous scrub	0	15.07	15.07	N/A
Poor	Improved grassland	91.24	0	-91.24	-100.00
	Standing Water	0.56	0	-0.56	-100.00

Table 8-8: Biodiversity – Metric Calculation Results (Linear)

Condition	Phase 1 habitat description	Biodiversity units			
		Before works	After works	Difference	Percentage Change
Good	Boundaries - Hedges - With trees	0	72,522.35	72,522.35	N/A
	Boundaries - Hedges - Intact	0	67,34.12	6,734.12	N/A
Moderate	Boundaries - Hedges - With trees	144.00	0	-144.00	-100.00
	Boundaries - Hedges - Intact	26,208.00	0	-26,208.00	-100.00
	Standing Water	11,004.00	33,285.71	22,281.71	202.49
Poor	Boundaries - Hedges - Defunct	3124.00	0	-3,124.00	-100.00

Table 8-9: Biodiversity – Biodiversity Unit Results

Habitat Category	Baseline	Operational	Difference	Percentage Change
Non-linear	151.44	168.44	17.00	11.23
Linear	40,480	11,254,218	72,062.18	178.02

8.6.31 To further demonstrate biodiversity gain, a number of enhancement measures have also been included as part of the Scheme design:

- Creation of reptile hibernacula- to be installed at the same time as the wetland areas – use waste material from the construction phase
- Installation of bird boxes - to be installed at same time as bat boxes and within close proximity to the bat boxes
- Bee posts - to be installed at same time as the ponds are created – use waste material from construction phase, or purchase posts, if necessary
- Wildflower meadows to be created around pond and wetland areas along the Scheme corridor - to be seeded in spring after wetland areas have been completed. Cutting regime to include annual cut in July / August and arisings removed). Scrub management may also be required
- Sensitive management of the ditch network – where possible, undertaking works outside of periods of highest ecological sensitivity and phasing works to

minimise impacts

- Sensitive management of the wetland areas – where possible, undertaking works outside of periods of highest ecological sensitivity and phasing works to minimise impacts

8.6.32 In addition to the mitigation measures outlined in the draft EPSL include the provision of bat boxes throughout the Scheme not only to compensate for the loss of potential roosting sites but to also provide further enhancements which would be made available prior to any site clearance works being undertaken and remaining in-situ throughout the operational phase.

8.6.33 Enhancement to be implemented is outlined in further detail within the Enhancement Strategy appended to the Outline CEMP (document reference TR010035/APP/7.2).

8.7 Residual Effects

8.7.1 The following section assesses the potential residual effects on the individual ecological resources.

Construction Phase

SPA / Ramsar Site Species (pink-footed geese, lapwing, curlew and little-egret)

8.7.2 Although no construction works would take place within the SPA or Ramsar site boundary, there is the potential for indirect effects upon the qualifying bird species of the sites which may be utilising habitats outside of the designated site which could be affected by the Scheme or through reduction in water quality downstream thereby impacting upon habitats that support the SPA / Ramsar site bird species

8.7.3 Construction is anticipated to last for approximately 2 years and commence in Spring 2020. The construction process would be phased, with different elements of the Scheme being completed at different times depending on the complexity of construction, and measures to keep traffic moving safely through the work sites. The potential for impacts on birds utilising land within and up to 300m from the Scheme would therefore vary throughout the construction period, and birds utilising land within or adjacent to the Scheme would not necessarily be affected for the entire duration of the construction phase.

8.7.4 Surveys undertaken over a 2-year period show that pink-footed geese, lapwing, curlew and little egret utilise fields within and adjacent to the footprint of the construction works (i.e. within 300m of the Scheme alignment) during the winter in numbers occasionally exceeding 1% of the SPA / Ramsar site populations (document reference TR010035/APP/6.8.4). These species may therefore be temporarily disturbed / displaced during the construction phase as a result of visual and noise disturbance and displacement from foraging / roosting habitat.

8.7.5 To mitigate for disturbance / displacement during the construction phase of the Scheme, a mitigation area at the northern end of the Scheme to the west of Shard Bridge has been proposed (refer to Section 8.6). The Mitigation Area would be temporarily managed to provide suitable habitat for foraging pink-footed geese, lapwing and curlew as mitigation for disturbance to birds utilising fields within Survey Areas 2 and 5 (refer to Figure 8.4). The pink-footed goose, lapwing, curlew and little egret populations have been valued as being of **International** importance. Through the provision of the mitigation measures stipulated, impacts upon the SPA qualifying species would be **Neutral**. In terms of EIA this would **not be significant**.

Wyre Estuary SSSI

- 8.7.6 Although no construction works would take place within the SSSI boundary, the potential for indirect effects upon the SSSI species has been considered. Given that only 2 SSSI species were identified during the surveys, 1 of which is discussed further above in Section 8.7.6 as also a qualifying feature of the SPA / Ramsar and the second species not identified in locations relevant to the Scheme, this receptor has not been considered any further within this assessment and impacts of this **Nationally** valued receptor considered to be **Neutral**. In terms of EIA this would **not be significant**.

Wyre-Lune rMCZ

- 8.7.7 The Wyre-Lune rMCZ is partially within the draft order limits, refer to Figure 8.1, designated sites. However, works proposed in this location would not be within the rMCZ. A short section of the rMCZ is adjacent to the Mitigation Area (refer to Figure 8.3). However, works to be undertaken in the Mitigation Area are minor and would not lead to adverse effect on the rMCZ. Direct physical loss, damage and pollution are therefore considered unlikely to occur. Mitigation measures would be appropriate to adequately reduce the risk of adverse effects to the rMCZ for example, through the implementation of the measures set out in the CEMP. Therefore, a **Neutral** significance category has been assigned and this receptor, which has been identified of **National** importance, and would not be considered further within this assessment. In terms of EIA this would **not be significant**.

Skippool Marsh and Thornton Bank BHS

- 8.7.8 The Skippool Marsh and Thornton Bank BHS is partially within the draft order limits, the same location as described for the Wyre-Lune rMCZ, refer to Figure 8.1. Again, as described for the rMCZ above, works proposed in this location would not be within the BHS. Direct physical loss, damage and pollution is therefore considered unlikely to occur. Mitigation measures are therefore considered appropriate to adequately reduce the risk of adverse effects to the BHS. Therefore, a **Neutral** significance category has been assigned and this receptor, which has been valued as being of **Regional** importance, and would not be considered further within this assessment. In terms of EIA this would **not be significant**.

Shard Bridge Field Ditch BHS and River Wyre – Upper Tidal Section BHS

- 8.7.9 The Shard Bridge Field Ditch BHS and River Wyre – Upper Tidal Section BHS, are sufficiently distant from the Scheme that direct, or indirect, adverse effects are considered unlikely. Mitigation, as detailed in the REAC (document reference TR010035/APP/7.3) appended to the Outline CEMP (document reference TR010035/APP/7.2), although not required to mitigate effects to these sites, would still serve to further safeguard each site. Therefore, a **Neutral** significance category has been assigned and this receptor would not be considered further within this assessment. In terms of EIA this would **not be significant**.

Coastal Saltmarsh and Mudflats

- 8.7.10 Due to the distance between the Scheme and these habitats, potential impacts have been scoped out of the detailed assessment. Therefore, a **Neutral** significance category has been assigned and this receptor, which has been valued

as **Regionally** importance, and would not be considered further within this assessment. In terms of EIA this would **not be significant**.

Rivers – Skippool Creek

- 8.7.11 Skippool Creek passes beneath the western extent of the Scheme. Works proposed in this location would not be within Skippool Creek. Direct physical loss, damage and pollution is considered unlikely, and would be adequately mitigated through mitigation, as detailed in the REAC (document reference TR010035/APP/7.3). Therefore, a **Neutral** significance category has been assigned and this receptor, which has been valued as being of **County** importance, and would not be considered further within this assessment. In terms of EIA this would **not be significant**.

Deciduous Woodland

- 8.7.12 Areas of deciduous woodland would be affected by the Scheme and have, therefore, been considered within the detailed assessment.
- 8.7.1 The deciduous woodland habitats to be permanently lost beneath the footprint of the scheme would total 6,287m² at the eastern extent of the Scheme. Given the permanent habitat loss, there would be fragmentation of the remaining woodland blocks either side of the Scheme at this location. The deciduous woodland habitats along the Scheme corridor have been valued of **Local** level importance.
- 8.7.2 Mitigation measures have been presented in Section 8.6 above. To compensate for the loss of woodland, new woodland planting would be incorporated into the Scheme design. The new planting would comprise native species of local provenance. The establishment of woodland habitats would take several years and would not mitigate and enhance the value of the woodland removed during construction until the operational phase of the Scheme.
- 8.7.3 Overall, the permanent loss of 6,287m² of woodland during construction is considered to be of medium duration. There would be a short-term negative effect lasting between 10 and 15 years as a result of the woodland loss which would be significant at the **Local** level until maturation of the compensatory planting. Therefore, the construction-phase impacts to this receptor, which is valued as being of local importance, has been allocated a **Moderate Negative** significance category. In terms of EIA this would be **significant**.

Hedgerows

- 8.7.4 Some sections of hedgerow would be affected by the Scheme and have therefore this receptor has been considered further within the detailed assessment.
- 8.7.5 A total of 6,312m of hedgerow would be lost as part of the Scheme during the construction phase. Of which 2,091m would be temporarily lost in order to accommodate the construction phase activities. The remaining 4,221m of hedgerow would be permanently lost beneath the footprint of the completed Scheme. The hedgerow network present along the Scheme corridor has been valued as being of **Local** importance.
- 8.7.6 Mitigation measures have been presented in Section 8.6 above. To compensate for the permanent loss of hedgerows, new linear planting would be incorporated into the Scheme design. The new planting would comprise native species of local provenance. The establishment of linear planting would take several years and would not mitigate or enhance the value of the hedgerows removed during

construction until the operational phase of the Scheme. It is anticipated that the landscape hedgerow planting would take between 5 and 10 years to establish and mature. Therefore, the construction phase impacts to this receptor, which is valued as being of local importance, has been allocated a **Slight Negative** significance category. In terms of EIA this would **not be significant**.

Ponds

- 8.7.7 A number of ponds would be affected by the Scheme and have therefore been considered further within the detailed assessment.
- 8.7.8 Six ponds would be lost as part of the Scheme during the construction phase. Three ponds would be lost temporarily (during construction) (P11, P62A, P62), and 3 ponds would be permanently lost beneath the footprint of the Scheme (P11A, P61 and P65), refer to Figure 8.2. The pond network along the Scheme corridor has been valued as being of **Local** importance.
- 8.7.9 Ponds removed temporarily during construction would be reinstated in the same location once the main construction works in the area have been completed and prior to the Scheme becoming operational. Reinstated and new ponds would be returned to a condition of ecological value equal to, or above that, identified during baseline surveys. In the event that a pond cannot be reinstated in close vicinity to its baseline location, an alternative location would be identified and agreed with stakeholders.
- 8.7.10 As detailed in Section 8.6 above, mitigation, where 3 ponds are to be permanently lost, these would be replaced, thereby resulting in no net loss of waterbodies along the Scheme corridor.
- 8.7.11 The loss of the ponds, whether permanent or temporary, is considered to be of a minor duration over the course of the construction phase thereby resulting in a short-term negative effect for approximately 2 years. As a result, a **Neutral** significance category has been assigned. There would be no net loss of the number of waterbodies within the vicinity of the Scheme. It is anticipated that the ponds would be left to naturally recolonise and establish aquatic flora. In terms of EIA this would **not be significant**.

Rivers – Main Dyke

- 8.7.12 As the Main Dyke would be affected by the Scheme, this receptor has been considered further within the detailed assessment.
- 8.7.13 The Scheme crosses Main Dyke at 2 locations, refer to the Environmental Masterplan (document reference TR010035/APP/6.19, Sheets 2 and 19). The Scheme includes widening of the existing Mains Lane bridge. These proposals include upgrading of the bridge's 2 existing culverts to a single larger culvert with increase capacity for water flow. Works required at the western extent of the Scheme are largely associated with the establishment of soft landscaping on either side of the A586 Garstang Road and would not require invasive works within Main Dyke. Full details of the culvert upgrade works are provided in Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12).
- 8.7.14 The works to be carried out in the vicinity of Main Dyke would not result in any fragmentation effects or habitat loss. However, the water quality assessment (refer to Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) identified the potential for negative effects on water quality of

the River Wyre and its associated tributaries, due to receipt of construction site runoff and potential for reduced flow conveyance capacity (particularly on the Main Dyke) due to sedimentation. However, mitigation measures have been incorporated into the Scheme to ensure the protection of water quality during both the construction and operational phases of the Scheme. In particular, attention would be paid to ensuring protection of water quality at the location of the new bridge crossing of the Main Dyke (at the western end of the Scheme) which flows directly into the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. The REAC (document reference TR010035/APP/7.3) and Pollution Control Plan (draft appended to the Outline CEMP (document reference TR010035/APP/7.2)) would be implemented during construction. This would include measures such as best practice construction site drainage management, provision of emergency response equipment and pollution prevention measures in line with CIRIA guidance.

- 8.7.15 Any in channel workings required to undertake the culvert works would be carried out sensitively under a method statement which the appropriate approvals in place, refer to Chapter 12: Road Drainage and the Water Environment for further information (document reference TR010035/APP/6.12).
- 8.7.16 The construction phase works would be temporary (approximately 9 months in duration). Given the mitigation measures that are to be implemented, effects are considered to be **Neutral** and therefore not significant at any geographical level. In terms of EIA this would **not be significant**.

Other Rivers

- 8.7.17 As a number of small watercourses would be affected by the Scheme, this receptor has been considered within the detailed assessment.
- 8.7.18 The Scheme would require 9 watercourse crossings along the Scheme corridor and therefore has potential to result in direct habitat loss and severance of the existing network of drainage ditches within the Survey Area. Refer to Environmental Masterplan (document reference TR010035/APP/6.19).
- 8.7.19 Culverts would be installed at each new watercourse crossing which would maintain habitat connectivity within the Survey Area in the long-term. However, the construction phase activities would require some in-channel workings in order to install the new culvert structures.
- 8.7.20 Although the working corridor for the installation of each culvert has been kept to a minimum, in line with the mitigation measures detailed above in Section 8.6, the Scheme would result in a loss of 1,249m of ditch network, of which 224m would be temporarily lost during the construction phase. The remaining 1,025m would be permanently lost under the footprint of the Scheme.
- 8.7.21 The implementation of the mitigation measures incorporated into the Scheme to ensure the protection of water quality during both the construction and operation phases of the Scheme (see Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12)) would also minimise the potential negative effects at the 9 crossings associated with changes in water quality during construction phase of the Scheme.
- 8.7.22 Areas of temporary habitat loss during construction would be reinstated prior to the Scheme becoming operational. Reinstated ditches would be returned to a condition of ecological value equal to or above that identified during baseline surveys. Areas

of permanent habitat would be compensated and substantially enhanced through the installation of new ditches totalling 6,742m.

- 8.7.23 Based on the mitigation measures to be implemented including those embedded into the Scheme design, construction phase impacts are anticipated to be **Neutral** particularly as the extent of habitat loss associated with these crossings would be limited in extent and would take place over a short duration. Furthermore, the vast majority of field drains in the Survey Area would remain undisturbed and connectivity amongst them unaffected. In terms of EIA this would **not be significant**.

Great Crested Newts

- 8.7.24 Given the confirmed presence of great crested newts within the vicinity of the Scheme, this receptor has been considered within the detailed assessment.
- 8.7.25 No confirmed great crested newt breeding ponds are anticipated to be lost or directly impacted during the construction phase. Terrestrial habitat areas along the route corridor would be impacted within the core sustenance zones (up to 500m from each pond) of ponds in which breeding great crested newts were confirmed, or assumed to be present (Ponds P7A, P12A, P14, P15, P20, P59, P68, P77, P83, P109, P109A and P110) (refer to Figure 8.2 and Appendix 8.2 (document reference TR010035/APP/6.8.2)).
- 8.7.26 The potential for great crested newts to be killed during the construction phase is considered unlikely due to the small to medium sized populations which have been recorded and that they are present at a low density. Working methods would be implemented to ensure a sensitive approach is undertaken including habitat manipulation and destructive searches particularly within the core sustenance zones of the confirmed great crested newt breeding ponds. The Scheme would be fenced off using temporary 1-way amphibian fencing to ensure great crested newts do not stray into the works area over the course of the approximate 2-year construction phase once the habitat areas have been cleared. Again, this approach to works is stipulated in more detail within the draft EPSL. In addition, mitigation and compensatory habitats would be created and made available and enhancements such as the provision of hibernacula would be undertaken during the earlier stages of the Scheme construction phase to ensure sufficient habitats are already made available prior to the site clearance works commencing.
- 8.7.27 Given the great crested newt distribution along the Scheme corridor, there is the potential for the new road alignment to fragment habitat areas where the Scheme would bisect pond clusters (refer to Figure 8.2). Fragmentation effects would likely be experienced from the start of the construction phase.
- 8.7.28 Great crested newts have been valued at the **Local** level in terms of importance. The construction phase activities would have a **Slight Negative** impact upon the local population. Although there would be the limited loss of terrestrial habitat, application of careful working methods and the provision of mitigation and compensatory habitat areas prior to site clearance works commencing. Fragmentation effects would not be able to be mitigated at this stage as safe crossing point mitigation, passing beneath the road would not be available for use until the later stages of construction. In terms of EIA this would **not be significant**.

Breeding Birds (Schedule 1 species)

- 8.7.29 Given the confirmed presence of barn owl within 300m of the Scheme during the

breeding season, this species has been included within the detailed assessment and would be considered further. Other Schedule 1 species (including peregrine, hen harrier and green sandpiper) are considered unlikely to be breeding on or within 300m of the application site due to the absence of suitable nesting habitat and a very low number of sightings during the breeding season surveys. Other Schedule 1 species have been scoped out of the assessment.

- 8.7.30 Barn owl have been recorded within the Survey Area, and 2 nesting / roosting sites have been identified (refer to Appendix 8.6 (document reference TR010035/APP/6.8.6)). However, all of the nest / roosting sites are located more than 230m from the Scheme and therefore would not be affected by the works. The majority of habitats to be lost comprise improved species poor grassland which is intensively managed and arable crop fields. All of which are of low suitability for use by barn owls. Although, a small proportion of the foraging habitat suitable for barn owl would be lost beneath the footprint of the Scheme, this only makes up a small amount of the available foraging habitat across the wider landscape within the typical home ranges of the barn owls confirmed as present. As such, there would be no significant effects on the barn owl population during the construction phase. Therefore, a **Neutral** significance category has been applied to this receptor which is considered to be of **County** value. In terms of EIA this would **not be significant**.

Breeding Birds (other notable species)

- 8.7.31 Given the confirmed presence of breeding birds (other notable species) along the Scheme corridor, this receptor has been considered further within the detailed assessment.
- 8.7.32 The breeding bird surveys identified a range of widespread species which would also be associated with habitats in the surrounding area. As such, the breeding bird assemblage associated with the Scheme corridor is considered to be of no more than **Local** value.
- 8.7.33 Construction activities have the potential to cause habitat loss (breeding and foraging) and disturbance to birds during the breeding season. Given the legal protection afforded to all breeding birds mitigation measures, such as avoiding vegetation removal during the breeding season, minimising habitat loss where possible, placing exclusion zones around retained hedgerows, ditches and woodland would be implemented during construction to ensure legislative compliance (see Section 8.6 above, Mitigation).
- 8.7.34 Overall, any impacts to breeding birds would be of short-duration and largely reversible following the implementation of mitigation, effects on this receptor are considered to be **Neutral**. In terms of EIA this would **not be significant**.

Bats

- 8.7.35 Given the confirmed presence of bats along the Scheme corridor, this receptor has been considered further within the detailed assessment.
- 8.7.36 To accommodate construction phase activities, 21 trees with low bat roost suitability were identified during the base line surveys, with 4 trees identified as having moderate potential. No trees with high bat roost potential or confirmed to support a bat roost were identified during the surveys. Four trees with bat roost potential would be lost beneath the footprint of the Scheme to accommodate the construction phase activities. Potential roost features i.e. tree with bat roost suitability (whether low or

moderate) would be compensated for on a 2:1 ratio.

- 8.7.37 An EPSL would be obtained from Natural England to permit the destruction of the confirmed common pipistrelle roost in Building B2 and B4. As part of the formal licence application a detailed method statement outlining the works to be implemented and the provision of compensatory roosting sites would be submitted. No works would take place until an approved Natural England bat licence has been obtained. Please note a draft ESPL has been issued to Natural England and a 'Letter of No Impediment' sought.
- 8.7.38 A small transitional common pipistrelle roost was also confirmed (B3) close to the draft order limits; therefore, construction activities in close proximity to this roost have potential to cause disturbance to the roost as a result of: increased levels of lighting, noise, and vibration above baseline levels. Works close to buildings B3 should, where possible, avoid the core active season for bats (between May and September) to minimise potential disturbance. Refer to Section 8.6 above for further details on Mitigation.
- 8.7.39 The removal of hedgerows and woodland during the construction phase would result in the severing of commuting routes / flight lines which could limit accessibility to foraging areas. Although there would be some localised disturbance during the construction phase and the need for an EPSL, the mitigation measures to be implemented, and the temporary nature of the construction phase should result in a **Neutral** impact being sustained to this receptor which is considered to be of **Local** Value. In terms of EIA this would **not be significant**.

Otters

- 8.7.40 Given the presence of watercourses along the Scheme corridor, and confirmed presence of otters, this receptor has been considered further within the detailed assessment.
- 8.7.41 As detailed in the Rivers – Main Dyke Section, above, the existing bridge over Main Dyke would be upgraded as part of the Scheme. Drain 29 would also be subject to culvert upgrade works and the existing road would be widened in this section during the construction phase. Although no resting sites or holts were identified, the construction phase activities have the potential to disturb otters using the watercourses. Subsequently, pre-construction surveys would be undertaken to ensure the absence of otters remains and that conditions on site have not changed. The application of sensitive site lighting thereby ensuring no watercourses are illuminated at night would also reduce the risk of disturbance when otters are most active. Given the proposed watercourse protection measures as detailed in Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), no adverse effects to water quality are anticipated. Given the confirmed evidence of otters in the locality, all excavations would need to be covered or fenced off to avoid otters becoming trapped following best practice detailed in the REAC (document reference TR010035/APP7.3). If this is not possible ramps / a means of egress would need to be provided. Permanent otter fencing would be installed at appropriate locations along the Scheme corridor (refer to Section 8.6 above, Mitigation for further details). Impacts to otters, which have been valued as being of **County** level importance are considered to be **Neutral**. In terms of EIA this would **not be significant**.

Badgers

- 8.7.42 Given the confirmed presence of badgers along the Scheme corridor, this receptor has been considered further within the detailed assessment.
- 8.7.43 Mitigation in relation to the approach to be adopted for badgers has been detailed in Section 8.6 above. Badgers are mobile species and the establishment of new setts prior to the start of construction is possible. A pre-construction badger survey would be undertaken not more than 6 months prior to the start of construction, the purpose of which would be to identify any localised constraints or licencing requirement relating to newly established badger setts. It is considered highly unlikely that baseline conditions would change significantly prior to construction, so the purpose of the update surveys would not be to comprehensively update baseline information relating to badger, but to identify localised constraints to avoid legal offenses.
- 8.7.44 If new badger setts are identified, the need for Reasonable Avoidance Measures (RAMS) or a Licence from Natural England to safely facilitate construction would be assessed.
- 8.7.45 Construction works on Mains Lane would relate to the de-trunking of the road and therefore would be minor and restricted to the footprint of the existing road. Potential for disturbance to this sett is therefore considered unlikely.
- 8.7.46 At this stage, a badger development licence is not anticipated to facilitate the construction phase activities. Construction phase impacts are anticipated to be **Neutral** for this receptor which has been valued as being of **Local** importance. In terms of EIA this would **not be significant**.

Operation

Deciduous Woodland

- 8.7.47 In the long-term, a net increase in the amount of woodland habitat along the Scheme corridor would be achieved and result in a long-term positive impact. It is anticipated that the compensatory woodland planting would take between 10 and 15 years to begin to mature from planting.
- 8.7.48 Given the limited areas of broadleaved woodland habitat currently available in the area, the provision of compensatory planting, as detailed in Section 8.6 above, would result in a long-term net increase thereby resulting in a **Moderate Positive** impact at the **Local** level. Woodland biodiversity units demonstrated a net increase of 15.48 units as a result of the Scheme. In terms of EIA this would be a **significant benefit**.

Hedgerows

- 8.7.49 Overall, the permanent loss of 4,221m of hedgerows during construction is considered to be of medium-duration. There would be a short-term (5 to 10 years) negative effect as a result of the hedgerow loss which would be significant at the Local level until maturation of the mitigation planting. In the long-term, the new linear planting would contribute to a net increase in hedgerow habitat within the vicinity of the Scheme. Given the net increase in hedgerows that would be achieved, a long-term **Slight Positive** Impact is anticipated during the operational phase which would be significant at the **Local** level. The Scheme would result in a significant increase in hedgerow biodiversity units in the long-term. This increase would be achieved

through the establishment of extensive lengths of intact hedgerows and hedgerows with trees and the removal of defunct hedgerows. In terms of EIA this would **not be significant**.

Ponds

- 8.7.50 Although 3 ponds would be temporarily lost during the construction phase (and reinstated) and 3 ponds permanently lost, reinstated and / or replaced ponds would mean no net loss in the number of waterbodies present along the Scheme corridor. Given the anticipated timescales needed for the ponds to establish, in the long-term the new ponds should be of a similar ecological quality / value if not better. Therefore, in the long-term a **Neutral** impact (at the very least) is anticipated at the **Local** level. Ponds and ditches are considered under the same habitat category (standing water) in the metric calculation. In terms of EIA this would **not be significant**.

Rivers – Main Dyke

- 8.7.51 As a result of the new culvert, the structure would be able to carry a higher capacity of water. Therefore, the upgrade works to the existing culvert, which discharges into Main Dyke, would reduce inundation during periods of high water-flow (refer to the Environmental Masterplan (document reference TR010035/APP/6.19, Sheet 2); this in turn would reduce sedimentation of Main Dyke during high water-flow periods and therefore represents an enhancement of this feature in the long-term.
- 8.7.52 The new culvert would potentially result in an increase in the quality of the riparian habitats present. Therefore, in the long-term a **Neutral** impact (at the very least) is anticipated at the **Local** level. In terms of EIA this would **not be significant**.

Other Rivers

- 8.7.53 Although there would be a permanent loss of some of the ditch network along the Scheme corridor, new ditch habitats are proposed as part of the Scheme design thereby ensuring a net increase of ditch habitats. Therefore, in the long-term a **Slight Positive** impact (at the very least) is anticipated at the **Local** level. In terms of EIA this would **not be significant**.

Great Crested Newts

- 8.7.54 Long-term habitat fragmentation due to the presence of the Scheme is probable, but culverts and mammal tunnels implemented for other species may also be used by newts, which would mitigate, to a certain extent, this fragmentation. Landscape planting installed during construction would also improve habitat quality and connectivity during the operation of the Scheme.
- 8.7.55 Increased mortality, injury and / or disturbance as a result of the new highway may occur. However, given the current habitat conditions to be impacted by the Scheme and the landscape design to be implemented, which includes landscape planting, grassland habitat creation (including the soft estate) and scrub, a significant net gain in terrestrial habitat would be achieved throughout the scheme in the long-term.
- 8.7.56 The landscape planting proposed as part of the Scheme design and new ponds proposed as mitigation for the loss of ponds would result in a net increase in abundance, quality and connectivity of terrestrial and aquatic habitat for great crested newts along the Scheme corridor. The landscape planting and the creation of new areas of terrestrial habitat in a currently intensively farmed arable environment would result in an overall net increase in optimal terrestrial habitat for great crested newts

with increased connectivity. The addition of crossing points would also improve the permeability of the scheme which is currently absent from the existing A585. In the long-term, the scheme would result in a **Moderate Positive** impact for this receptor at the **Local** level. In terms of EIA this would be a **significant benefit**.

SPA / Ramsar Site Species (Pink-footed geese, lapwing, curlew and little egret)

- 8.7.57 The wintering bird surveys, undertaken over a 2-year period, show that pink-footed geese, lapwing, curlew and little egret utilise fields adjacent to existing sources of disturbance from the A585/A586 and nearby infrastructure associated with Skippool and Poulton-le-Fylde. Birds using habitats near to the Scheme are therefore habituated to a higher level of disturbance than birds utilising more rural locations.
- 8.7.58 Traffic forecasting and noise modelling undertaken for the Scheme show that noise levels would change as a result of construction of the new road; however, this change is likely to provide a wider beneficial effect to SPA/Ramsar site bird species in the long-term. Although there would be an increase in noise levels in fields adjacent to the new offline sections of the new road (between 0 to 10 dB), this is countered by a decrease in noise levels (between 0 to 10 dB) in fields adjacent to the River Wyre (due to de-trunking of the existing A585 as part of the Scheme) (refer to Figure 11.6 within Chapter 11: Noise and Vibration (Document Reference TR010035/AAP/6.11)). Whilst relatively small numbers of birds are using habitats within and adjacent to the new road Scheme (only 15 flocks of 1% or greater of the SPA/Ramsar site population of pink-footed geese, curlew, lapwing and little egret were recorded within 300m of the Scheme), the vast majority of birds (and largest flock sizes) were recorded in the areas within and adjacent to the River Wyre. Therefore, the decrease in noise levels in fields close to the SPA/Ramsar site would provide a greater benefit to a larger number of birds compared to a slight increase in noise levels where fewer birds were recorded.
- 8.7.59 Maintenance works would be required once the road is operational. This would include activities such as resurfacing the carriageway, repairs to damaged assets or their replacement when they approach the end of their life along with routine cleansing and dealing with the results of adverse weather conditions. The majority of these works would take place within the highway boundary but some, including maintenance of the drainage wetland areas and drainage outfalls, would extend beyond the highway boundary.
- 8.7.60 Safety critical maintenance (such as replacement of damaged safety fence) would have to be carried out at any time of the year. Major maintenance works and activities outside of the highway boundary would, where possible, be carried out outside of the over wintering bird season (i.e. not between October and March) thereby reducing potential impacts on SPA/ Ramsar site species. For those activities which could take place during the winter months, these would generally occur in discrete and relatively limited locations on or adjacent to the new road. Therefore, potential disturbance/displacement effects, associated with maintenance of the completed Scheme, would be negligible.
- 8.7.61 Birds which choose to utilise fields adjacent to the new Scheme would experience an increase in noise levels, however, the relatively small numbers of birds currently utilising habitats near to the Scheme are habituated to a higher level of disturbance/displacement and are likely to become habituated to the new Scheme in the long-term. In addition, the completed Scheme would comprise extensive areas

of landscape planting, including new areas of woodland, and planting on the embankments. The Scheme would also include new noise and visual screening, as well as sections within a cutting. All of these features would further act to reduce the potential noise and visual disturbance from the completed Scheme. As such, no operational phase impacts on pink-footed geese, lapwing, curlew and little egret, which are a qualifying feature of the **Internationally** important designated sites are envisaged and therefore the significance category to be applied is **Neutral**. In terms of EIA this would **not be significant**. Also refer to the A585 Windy Harbour to Skippool HRA (document reference TR010035/APP/5.4).

Breeding Birds (Schedule 1 species)

- 8.7.62 As part of the landscape design and mitigation packages to be implemented for other species such as the creation of ponds and woodland planting mixes which are to also incorporate rides comprising semi-natural grassland, positive benefits and suitable habitats local enhancements would be provided for barn owls. Therefore, these measures would lead to a long-term beneficial **Slight Positive** impact at the **County** level during the operational phase. In terms of EIA this would **not be significant**.

Breeding birds (other notable species)

- 8.7.63 In the long term, the new landscape planting would contribute to a net increase in hedgerow and woodland habitats available thereby providing nesting and foraging opportunities. Therefore, this would lead to a long-term beneficial **Moderate Positive** impact at the **Local** level during the operational phase. In terms of EIA this would be a **significant benefit**.

Bats

- 8.7.64 Landscape planting would be installed prior to the Scheme becoming operational. This landscape design for the Scheme would result in a net increase in foraging habitat available. Although some flight-lines (hedgerows) would be permanently severed in order to accommodate the scheme, the provision of oversized culverts/safe crossing points would still ensure commuting routes are available. The use of these would be encouraged through the implementation of the landscape design and strategic planting to guide bats to the safe crossing points. Due to the time required for new planting to become established, although implemented during construction, new planting would not be realised as a resource for bats until the operational phase of the Scheme. However, scrub planting would be implemented around crossing point entrances to encourage use by bats.
- 8.7.65 Noise, lighting and pollution from the Scheme has potential to displace bats from the area although mitigation and a sensitive lighting strategy would ensure any adverse effects from lighting would be avoided / kept to a minimum around junction areas. The use of baffles, to ensure that lighting remains directional and light-spill avoided, could be implemented. Additionally, during baseline surveys, bats were frequently recorded using hedgerows and woodland areas adjacent to existing lit roads, suggesting they are, to some extent, tolerant / habituated to light and noise pollution from roads
- 8.7.66 The new highway may result in increased bat fatalities. As stated above, the provision of additional landscaping and safe crossing points passing beneath the carriageway would ensure the Scheme is permeable. Planting and fencing would be

used to guide bats to these crossing points to maximise the likelihood of uptake and to avoid mortality and bats crossing the Scheme at carriageway height. In addition, the new Scheme includes the de-trunking on the existing A585 Mains Lane. This action would inherently reduce traffic levels below baseline levels and would offset, to a certain extent, the risk of RTAs in the Survey Area as the bats would continue to use the existing trees and shrubs.

- 8.7.67 Operational effects are unlikely to adversely affect the conservation status of these species given the better-quality habitats in the local area and the abundance and distribution of these species in the wider landscape as well as the mitigation to be provided. Therefore, impacts to the local bat population, which has been valued as being of **Local** importance, are considered to be **Neutral** in the long-term. In terms of EIA this would **not be significant**.

Otters

- 8.7.68 Habitat fragmentation would be limited to a reduction in terrestrial habitat of low suitability lost beneath the footprint of the Scheme. Aquatic terrestrial connectivity would be mitigated in the long-term through the maintenance of existing culverts and watercourses wherever possible; additionally, purpose-designed culverts suitable for use by otters would be installed where the Scheme creates new watercourse crossing points. Culverts suitable for use by otters would be installed at the 5 of the 9 watercourse crossing points along the Scheme corridor, refer to Environmental Masterplan (document reference TR010035/APP/6.19), Sheets 2, 4, 5, 6 and 7. Each culvert would be equipped with a ledge suitable for use by otter during periods of high-water flow. However, the limited vertical alignment has meant that a dry pipe would be installed adjacent to the crossing point as shown on Sheet 7 of the Environmental Masterplan (document reference TR010035/APP/6.19). Permanent otter-proof fencing is to be installed along the Scheme at appropriate locations as detailed in Section 8.6 above and as presented on the Environmental Masterplan (document reference TR010035/APP/6.19). Consequently, aquatic habitat connectivity would be maintained post-construction and mitigation would be in place to reduce the likelihood of otter accessing the highway and succumbing to RTAs. Therefore, effects during operation upon this receptor, which is valued as being of **County** importance, are considered to be **Neutral** in the long-term and not significant. In terms of EIA this would **not be significant**.

Badgers

- 8.7.69 Given the locations of the 2 setts, the Scheme is likely to result in habitat fragmentation. As mitigation, 3 mammal tunnels would be installed along the Scheme corridor, refer to Environmental Masterplan (document reference TR010035/APP/6.19), Sheets 4 and 5.
- 8.7.70 Fatalities due to RTAs are possible but unlikely to occur given the permanent badger-proof fencing that is to be installed along the Scheme corridor as detailed in Section 8.6 above. Additionally, the de-trunking of the Garstang Road, closest to the active badger sett may serve to reduce existing baseline impacts associated with RTAs.
- 8.7.71 Effects during operation upon this receptor, which is valued as being **Locally** important, are considered to be **Neutral**. In terms of EIA this would **not be significant**.

8.8 **Monitoring**

- 8.8.1 Monitoring is not required to inform the accuracy of the assessment of effects; however, to ensure the successful implementation of mitigation measures, monitoring would be undertaken before, during and after the construction phase. The results of the monitoring would be reviewed to ensure that the mitigation measures for the Scheme continue to be appropriate and effective. Monitoring proposed includes the following:
- Bird monitoring would be undertaken during the construction phase of the Scheme. This would specifically look at the responses of birds to the Scheme in relation to the provision of alternative habitat for pink-footed geese, lapwing, curlew and little egret. The results of the monitoring would be reviewed to ensure that the mitigation measures for the Scheme continue to be appropriate and effective. Details of the monitoring strategy would be determined in consultation with Natural England. Refer to the Bird Mitigation Strategy (appended to the Outline CEMP – document reference TR010035/APP/7.2) for full details
 - Monitoring would be undertaken annually for the first 5 years after construction to assess the success of the new linear planting and woodland. Where necessary trees would be replaced
 - To identify any maintenance requirements, tunnels, culverts and fencing installed for otters and badgers would be monitored annually for the first 3 years. Rectification measures, if required, would be implemented within 6 months of being identified
 - All new and reinstated ponds would be monitored annually for the first 3 years of the operational phase of the Scheme. Rectification measures, if required, would be implemented within 6 months of being identified
- 8.8.2 A suitably qualified ECoW would be available during construction responsibilities would include advising on micro-siting of infrastructure to minimise habitat impacts. The ECoW would be available for the duration of the construction period to resolve any uncertainties regarding ecological issues and to monitor compliance with good practice mitigation measures (as defined in the REAC (document reference TR010035/APP/7.3)). The ECoW would undertake all necessary surveys (e.g. for breeding birds) during the construction period to ensure up-to-date information is available.
- 8.8.3 Monitoring of all habitat mitigation measures (e.g. ponds, culverts, bat boxes) would be undertaken during the 3-year aftercare period by a suitably qualified ecologist.
- 8.8.4 Details of mitigation and enhancement measures as implemented would be made available to Highways England in a format compatible with their ENVIS Asset Management System to facilitate effective long term of these measures. It is recommended that provision of this information is included within terms agreed with the appointed contractor and forms part of the consignment of works required prior to the site being handed over to Highways England after construction.

8.9 Summary

- 8.9.1 The assessment has considered the likely impacts upon designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity and has sought

- opportunities which may benefit biodiversity interests within the draft order limits and the wider environment as required by the NN NPS.
- 8.9.2 In line with NN NPS, the assessment demonstrates the approach the Scheme has taken to avoid and mitigate its effects on ecology and nature conservation.
- 8.9.3 The nature of the Scheme, a new highway with large land-take means that opportunities to provide biodiversity enhancements are extensive. Efforts have been made to maximise benefits potentially achieved; biodiversity enhancement measures would be delivered in accordance with the requirement of the NN NPS.
- 8.9.4 Biodiversity units as a result of the Scheme would be significantly higher than existing conditions.
- 8.9.5 Mitigation measures outlined within this chapter address the effects of the Scheme during construction and operation. The extent of the draft order limits has been minimised wherever possible, and best practice measures are proposed to address the potential adverse effects of pollution, vegetation/habitat removal, disturbance and road mortality, as required by the provisions of the NN NPS.
- 8.9.6 Habitats would be reinstated (and created) within the soft estate once construction works have been completed and areas become available and biodiversity benefits would be taken into account as part of the landscape design. This would include the use of wildflower seed mixes and native and fruit-bearing species which would provide benefits to a wildlife in general.
- 8.9.7 Mitigation measures implemented would comprise pre-construction destructive searches and safe working practices to prevent injury or disturbance to animals during construction; installation of structures underneath the carriageway to maintain habitat connectivity; woodland and linear planting to offset habitat loss and improve habitat connectivity; the establishment of aquatic habitats for great crested newts; and, during construction, the provision of refuge habitats for pink-footed geese.
- 8.9.8 EPS licenses for bats and great crested newts would be obtained, where appropriate. Licences have been drafted and issued to Natural England and letters of no impediment have been sought.
- 8.9.9 Significant adverse effects during construction have been identified for deciduous woodland; this is due to the unavoidable habitat loss required for construction of the Scheme. However, this would be a temporary loss and once the landscape design for the Scheme has matured, in the long-term there would be a net gain. The Scheme's residual effects in relation to ecology and nature conservation have been assessed to be slightly negative, neutral or slightly positive, but not significant in terms of EIA Regulations.
- 8.9.1 Through the application of the biodiversity metric, the results of the calculations determined that there would be a net gain of 17 biodiversity units for non-linear habitats and 72,062.18 biodiversity units for linear habitats. The net increase in biodiversity is as a result of increasing the quality of the habitats post-construction (for example, defunct or species-poor hedgerows would be replanted so as to achieve species-rich and continuous hedgerows, once re-established), and increasing the quantity of the habitats (for example, less than 1ha of broadleaved woodland would be lost, but this would be replaced with more than 5ha of new woodland planting). By improving the quality of the habitats this would increase the distinctiveness score after construction, and increasing the quantity of the habitat

would increase the area score after construction. Thereby resulting in a net increase in the number of biodiversity units post construction.

8.10 References

Amphibian and Reptile Groups of the United Kingdom (2010) *ARG UK Advice Note 5: Great Crested Newt Habitat Sustainability Index. Amphibian and Reptile Groups of the United Kingdom. [Online] Available from: <https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file> [Accessed March 2018].*

Andrews (2013) *Chapter B5 – Tree-roosting bats – Inspecting & Assessing PRF, Chapter B5*

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Wouldiams P and Dunn F (2014) *Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt. Appendix 5. Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt (Triturus cristatus) Environmental DNA. Freshwater Habitats Trust, Oxford.*

Chanin P. (2005) *Otter Surveillance in SACs: Testing the Protocol. English Nature Research Reports - Number 664, English Nature, Peterborough*

Chartered Institute of Ecology and Environmental Management (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*

Chartered Institute of Ecology and Environmental Management (2017) *Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute for Ecology and Environmental Management, Winchester*

Countryside and Rights of Way Act (2000) *London: The Stationery Office*

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London*

Cresswell P., Harris S., & Jefferies D.J. (1990) *The History, Distribution, Status and Habitat Requirements of the Badger in Britain. Nature Conservancy Council, Peterborough*

Dean M., Strachan R., Gow D. and Andrews R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London*

Department for Communities and Local Government (DCLG) (2014) *National Planning Practice Guidance*

Department for Communities and Local Government (2018) *National Planning Policy Framework*

Department for Environment, Food and Rural Affairs (2007) *Hedgerow Survey Handbook. A Standard Procedure for local surveys in the UK. Defra, London*

Department for Environment, Food and Rural Affairs (2018) *Multi-Agency Geographical Information System (MAGIC) [Online] Available from: <http://magic.defra.gov.uk> [Accessed February 2018]*

English Nature (2001) *Great Crested Newt Mitigation Guidelines. English Nature,*

Peterborough

ERAP Ltd (2013) *Land off Garstang Road, Little Poulton, Poulton-Le-Fylde - Ecological Survey and Assessment*

Froglife (1999) *Reptile Survey: An Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation. Froglife Advice Sheet 10. Froglife, Halesworth*

Fylde Council, (2018) *Fylde Local Plan to 2032* [Online] Available at: <http://www.fylde.gov.uk/council/planning-policy--local-plan-/local-development-framework/www-fylde-gov-uk-submission/> [last accessed August 2018].

Fylde Council (2005) *Fylde Local Plan 1996-2006 (as altered 2005)*

Gent T, Gibson S (2003) *Herpetofauna Workers Manual. JNCC, Peterborough*

Gilbert, et al., (1998) *Bird Monitoring Methods: A Manual of Techniques for Key UK Species. RSPB*

Google Earth Pro (2018). Google Earth Pro 7.1.5.1557 [Online] Available from: <https://www.google.co.uk/earth/download/gep/agree.html> [Accessed February 2018].

Hundt L (2012) *Bat Surveys: Good Practice Guidelines, 2nd Edition, Bat Conservation Trust*

Highways England (2018). *Chief Highway Engineer Memorandum 422/18*

Langton T., Beckett C. and Foster J., (2001) *Habitat Suitability Index: Great Crested Newt Conservation Handbook. Froglife, Halesworth*

Harris, S., Cresswell, P., and Jeffries, D.J., (1989) *Surveying Badgers. Mammal Society, London*

Her Majesty's Stationery Office 1997 Hedgerow Regulations.

Highways Agency (1992) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 Nature Conservation, Part 2 Nature Conservation Advice in Relation to Badgers. HA 59/92*

Highways Agency (1993) *Design Manual for Roads and Bridges Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 4 Ecology and Nature Conservation*

Highways Agency (1999a) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 Nature Conservation, Part 3 Nature Conservation Advice in Relation to Bats. HA 80/99*

Highways Agency (1999b) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 Nature Conservation, Part 4 Nature Conservation Advice in Relation to Otters. HA 81/99*

Highways Agency (2001) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 The Good Roads Guide – Nature Conservation, Part 1 Nature Conservation and Biodiversity. HA 84/01*

Highways Agency (2001) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 Nature Conservation, Part 6 Nature Conservation Management Advice in Relation to Amphibians. HA 98/01*

- Highways Agency (2005) *Design Manual for Roads and Bridges Volume 10 Environmental Design and Management, Section 4 Nature Conservation, Part 7 Nature Conservation Advice in Relation to Reptiles and Roads*. HA 116/05
- Highways Agency (2008) *Design Manual for Roads and Bridges Volume 11 Environmental Assessment, Section 2 Environmental Impact Assessment, Part 5 Assessment and Management of Environmental Effects*. HA 205/08
- Highways Agency (2009) *Design Manual for Roads and Bridges Volume 11 Environmental Assessment, Section 4 Assessment of Implications on European Sites, Part 1, Assessment of Implications (of Highways and/or Roads Projects) on European Sites (Including Appropriate Assessment)*. HD 44/09
- Highways Agency (2010) *Interim Advice Note 130/10. Ecology and Nature Conservation Criteria for Impact Assessment*. IAN 130/10
- Highways Agency (2010) *Highways Agency Environmental Strategy*
- Joint Nature Conservation Committee (2010) *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit*. Revised print, JNCC, Peterborough
- MAGIC (2014) [Online] Available from <http://magic.defra.gov.uk/>
- Mouchel (2013) *A585 Windy Harbour Junction Improvements – Extended Phase 1 Habitat Survey*
- Mouchel (2014) *A585 Windy Harbour Junction Improvements – Great Crested Newt Survey Report*
- National Biodiversity Network (2017). National Biodiversity Network (NBN) Atlas. [Online] Available from: <https://nbnatlas.org/> [Accessed July 2017].
- National Joint Utilities Group (2007) *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. Volume 4, NJUG*
- National Rivers Authority (1992) *River Corridor Surveys. Conservation Technical Handbook Number 1*.
- Natural Environment and Rural Communities Act (2006) *London: The Stationery Office*
- Natural England (2011) *Assessing population status of the great crested newt in Great Britain (NERC080) First Edition. October 2011*
- Rodwell, J.S. (1991). *British Plant Communities. Publication in Five Volumes. Cambridge University Press. Cambridge*
- Rodwell, J.S. (2006). National Vegetation Classification: User's Handbook. Joint Nature Conservation Committee. Peterborough. [Online] Available from: http://jncc.defra.gov.uk/pdf/pubo6_NVCusershandbook2006.pdf [Accessed 18/01/2018].
- Shawyer, C. R. (2011). *Barn Owl (Tyto alba) Survey Methodology and Techniques for Use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.
- Statutory Instrument 1151. The Wildlife and Countryside Act 1981 (Variation of Schedule 4) Order 1994. (1994) The Stationary Office Limited
- Statutory Instrument (1992) *Protection of Badgers Act 1992. London: The Stationery*

Office

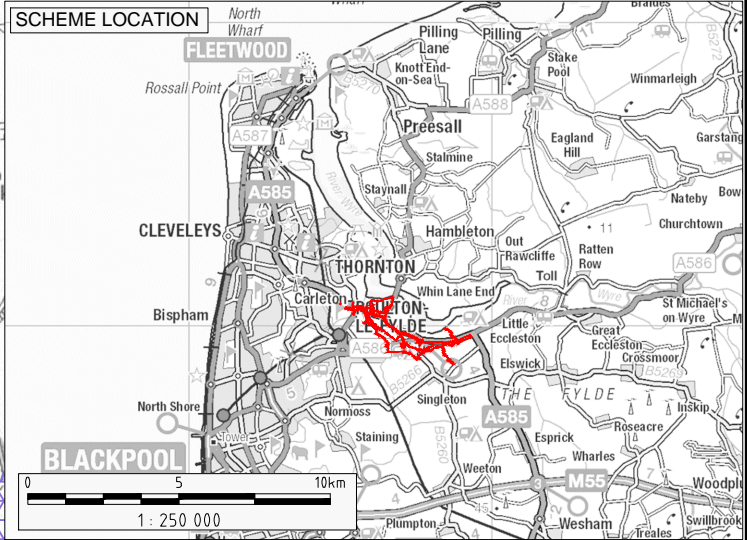
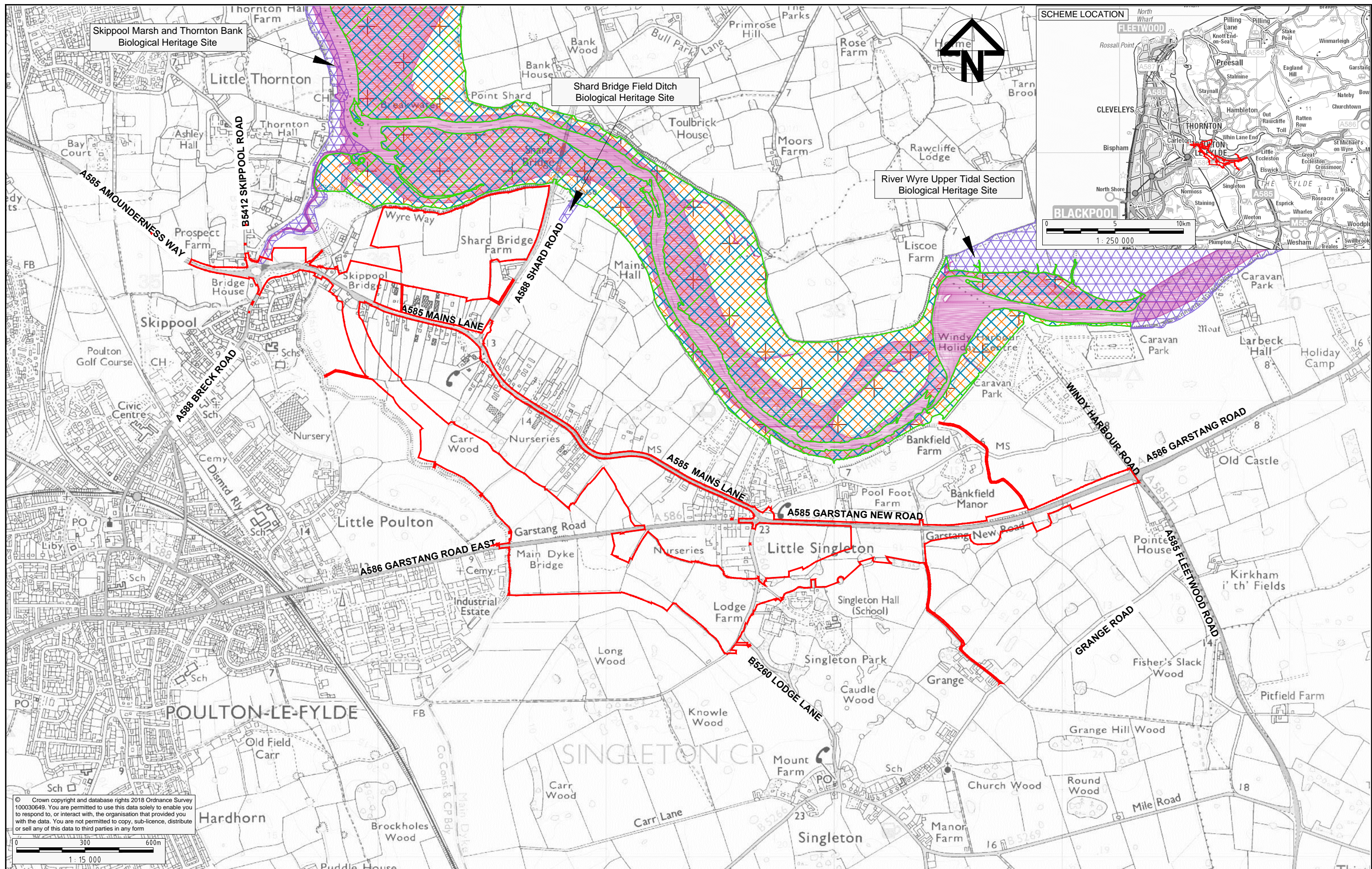
The Conservation of Habitats and Species Regulations (2010) *London: The Stationery Office*

Wyre Council, (2018) *Wyre Local Plan to 2031* [Online] Available at: http://www.wyre.gov.uk/info/200319/wyres_emerging_new_local_plan (last accessed August 2018).

Wyre Council Local Plan (1999) *Wyre Local Plan*

8.11 **Figures**

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Scale: 1:15 000

KEY:	
	Draft Order Limits
	Morecambe Bay Ramsar Site
	Morecambe Bay and Duddon Estuary Special Protection Area (SPA)
	Biological Heritage Site
	Site of Special Scientific Interest
	Important Bird Area
	Recommended Marine Conservation Area



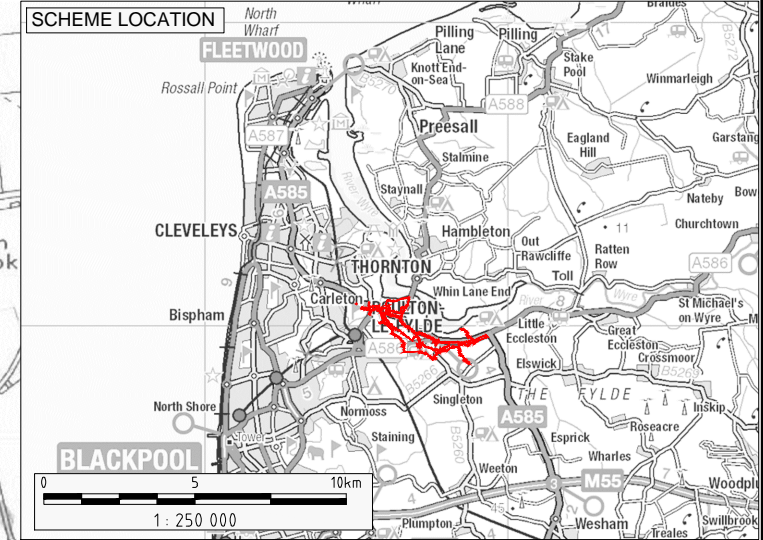
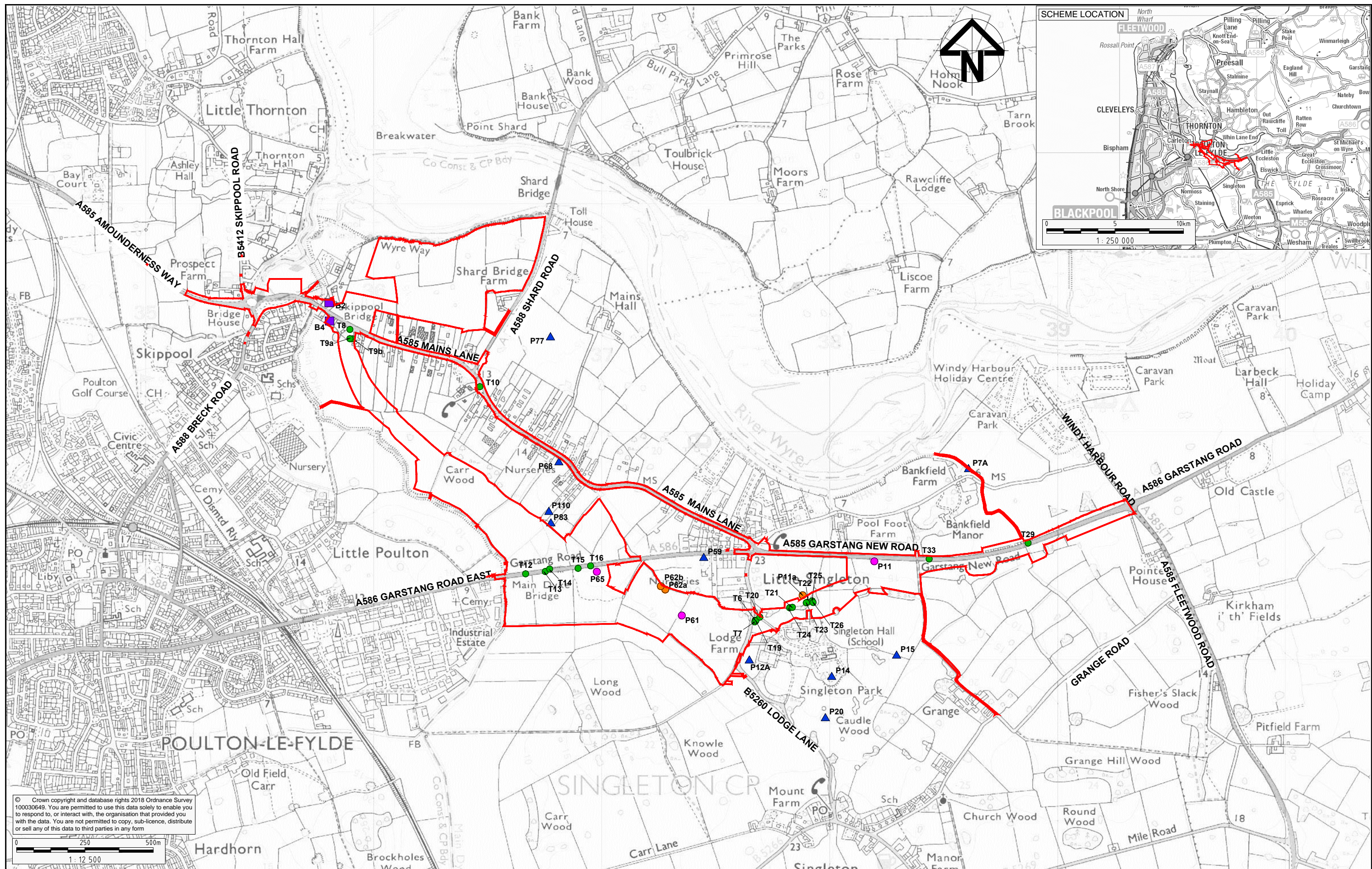
Client: **highways england**

Project: **A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME**

Drawing Title: **ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) BIODIVERSITY: DESIGNATED SITES**

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035	FIGURE	8.1
Drawing number: HE/EN/Operat/Issue/Location/Type/Revision Number HE548643-A585-EAC-SZ_GN000-DR-L-3019			

Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved
0	SB	OCT18	SB - DCO SUBMISSION	JN	KB	NH



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0 250 500m
1:12 500

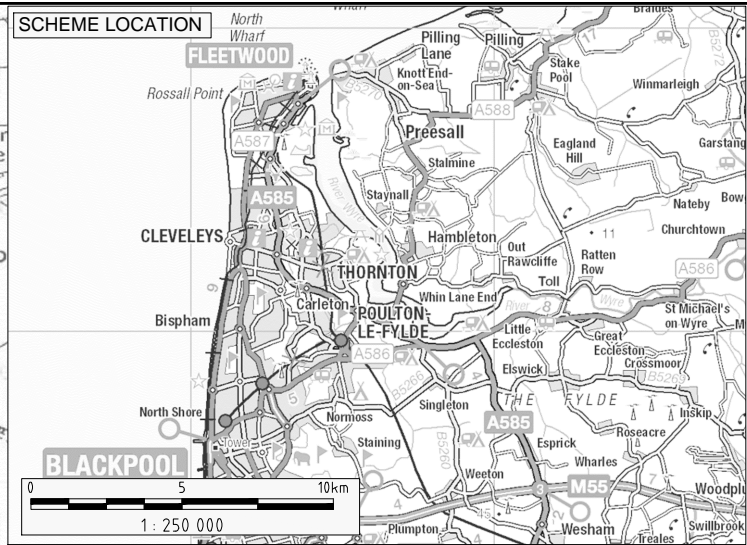
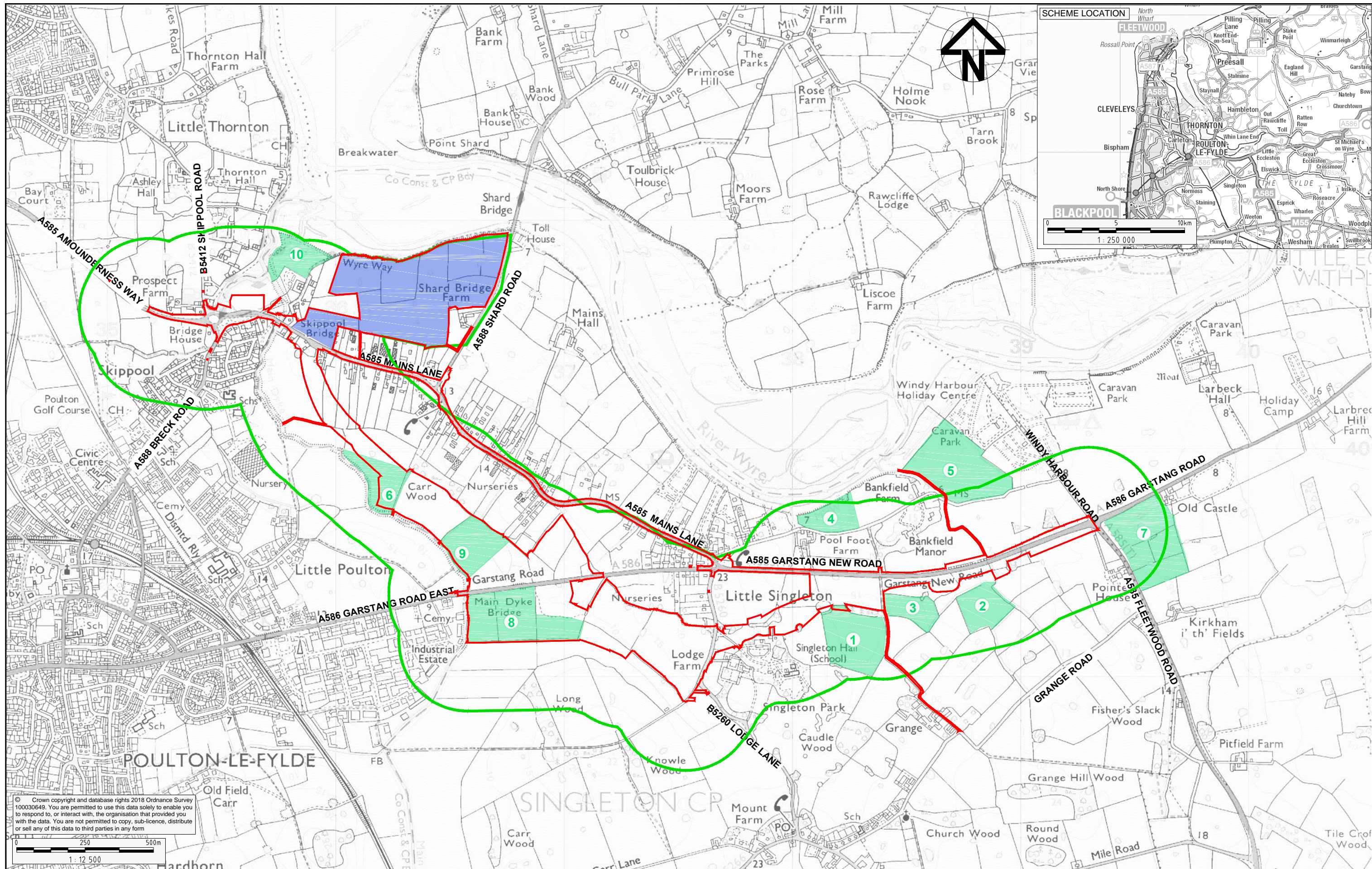
KEY:	
	Draft Order Limits
	Tree with Bat Roost Potential
	Bat Roost Building
	Pond Lost Permanently
	Pond Lost Temporarily
	GCN Presence Confirmed



Client
Project A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME
Drawing Title ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) BIODIVERSITY: ECOLOGICAL FEATURES

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:12 500 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035	FIGURE	8.2
Drawing number HE/EN/Originator/Issue/Location/Type/Revision Number HE548643-A585-EAC-SZ_GN000-DR-L-3020			

Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH



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0 250 500m
1:12 500

KEY:

- Draft Order Limits
- 300m Construction Buffer
- Temporary Mitigation Area
- Fields Supporting 1% or greater SPA/Ramsar species

0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH
Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved

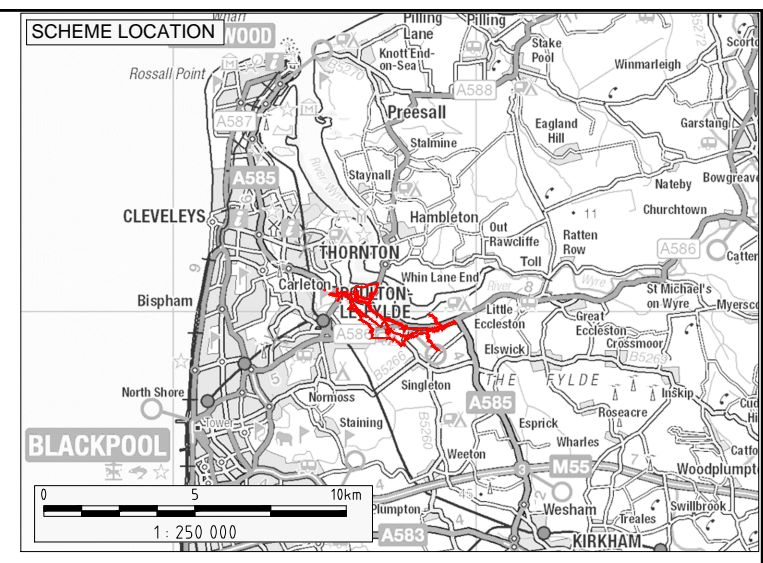
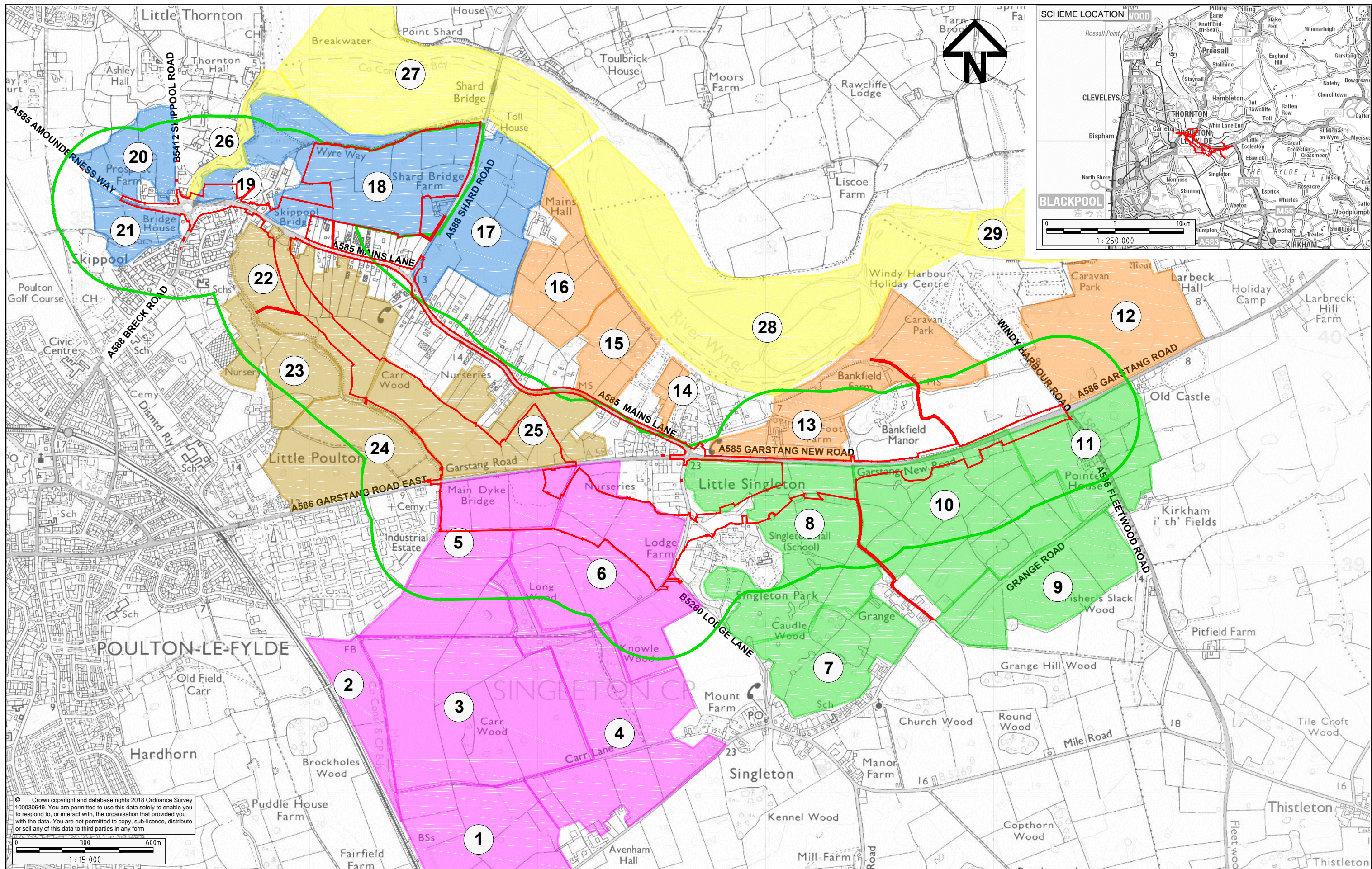


Client
Project
Drawing Title

A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) BIODIVERSITY: MITIGATION AREAS

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:12 500 @ A3	Date	OCT 2018
Drawn By	J.NORMAN	Checked By	K.BURROWS
Approved By	N.HENDERSON		
PINS No.	TR010035	FIGURE	8.3
Drawing number	HE548643-A585-EAC-SZ_GN000-DR-L-3020		



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0 300 600m
1:15 000

KEY:	
	Draft Order Limits
	Construction Area 300m Buffer
	Land Parcel Number
	Bird Survey Area 1
	Bird Survey Area 2
	Bird Survey Area 3
	Bird Survey Area 4
	Bird Survey Area 5
	Bird Survey Area 6

Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved
0	S8	OCT18	S8 DCO - FINAL SUBMISSION	JN	KB	NH



Client
Project A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME
Drawing Title ENVIRONMENTAL STATEMENT REGULATION 5(2)(a) BIODIVERSITY: SCHEME LOCATION, SURVEY AREAS AND LAND PARCEL NUMBERS

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035	FIGURE	8.4
Drawing number HE548643-A585-EAC-SZ_GN000-DR-L-3021			