

# A47 Wansford to Sutton Dualling

**Scheme Number: TR010039**

## **Volume 6**

### **6.9 Report to Inform Habitats Regulations Assessment**

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Forms and Procedure) Regulations 2009

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**The Infrastructure Planning  
(Applications: Prescribed Forms and  
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A47 Wansford to Sutton  
Development Consent Order 202[x]

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**6.9 REPORT TO INFORM HABITATS REGULATIONS  
ASSESSMENT**

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# 1. Introduction

## 1.1. Background

- 1.1.1. Highways England (the Applicant) has submitted an application for an order to grant a development consent order (DCO) for the A47 Wansford to Sutton Scheme (hereafter referred to as ‘the Proposed Scheme’). The Proposed Scheme comprises the dualling of a section of the A47 between Wansford to Sutton; improvements to the A47 Wansford junction; creation of the A47 Sutton Heath roundabout to replace the Nene Way roundabout; associated side road alterations; and walking, cycling and horse-riding connections.
- 1.1.2. This section of A47 road is currently unable to cope with the high traffic volume and there are limited opportunities to overtake slower moving vehicles on the single carriageway. The Proposed Scheme aims to reduce congestion related delay, improve journey time reliability and increase the overall capacity of the A47. Full details of the Proposed Scheme are provided in Environmental Statement (Chapter 2) (**TR010039/APP/6.1**).
- 1.1.3. The key elements of the Proposed Scheme include:
- approximately 2.6km of new dual carriageway constructed largely offline of the existing A47, including the construction of two new underpasses
  - a new free-flow link road connecting the existing A1 southbound carriageway to the new A47 eastbound carriageway
  - a new link road from the Wansford eastern roundabout to provide access to Sacrewell Farm, the petrol filling station and the Anglian Water pumping station
  - closure of the existing access to Sacrewell Farm with a new underpass connecting to the farm from the link road provided
  - a new slip road from the new A47 westbound carriageway also providing access to the petrol filling station
  - a link road from the new A47 Sutton Heath roundabout, linking into Sutton Heath Road and Langley Bush Road
  - new junction arrangements for access to Sutton Heath Road and Langley Bush Road
  - closure of the existing accesses to the A47 from Sutton Heath Road, Sutton Drift and Upton Road
  - new passing places and limited widening along the Upton Drift (also referred to as Main Road)
  - new walking and cycling routes, including a new underpass at the disused railway
  - new safer access to the properties on the A1, north of Windgate Way
  - installation of boundary fencing, safety barriers and signage
  - new drainage systems including:
    - two new outfalls to the River Nene

- extension of the A1 culvert at the Mill Stream
- realignment and replacement of the A47 culvert at the Wittering Brook
- compensatory flood storage
- dry culverts to maintain overland flow paths
- new attenuation basins, with pollution control devices, to control discharges to local watercourses
- works to alter or divert utilities infrastructure such as electricity lines, water pipelines and telecommunications lines
- temporary compounds, material storage areas and vehicle parking required during construction
- environmental mitigation measures

1.1.4. Under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the Proposed Scheme is an Environmental Impact Assessment (EIA) development and as such requires submission of an Environmental Statement (ES) presenting the likely significant environmental effects of the Proposed Scheme. The ES provides the background information which has informed this assessment.

1.1.5. This report has been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended) to present information to inform the Habitats Regulations Assessment that will be undertaken by the Secretary of State when determining the DCO application.

## 1.2. The Habitats Regulations

1.2.1. The Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna ('Habitats Directive') is transposed into English law by The Conservation of Habitats and Species Regulations 2017 (as amended) ('The Habitats Regulations').

1.2.2. Part II, Paragraph 12 of The Conservation of Habitat and Species Regulations 2017 (England and Wales) provides a definition of the term "European Site" which it identifies as including Special Areas of Conservation (SAC) and Special Protection Areas (SPA) as well as candidate / proposed sites (cSAC and pSPA) which are being consulted on or are pending a European Commission decision. However, the Habitats Regulations do not provide statutory protection for pSPAs or to cSACs before they are agreed with the European Commission.

1.2.3. The Habitats Regulations set out the process that must be followed where an application for development consent may have effect on a site of nature conservation importance if a 'European site', hereon referred to as a site within the National Site Network (NSN).

1.2.4. For the purpose of this assessment, NSN sites include: Special Areas of Conservation, ~~(SAC)~~, Special Protection Areas ~~(SPA)~~, Sites of Community

Importance (SCI), European Marine Sites (EMS) and Wetlands of International Importance designated under the Ramsar Convention (known as Ramsar sites). These also include candidate and possible sites (e.g. cSACs and pSACs) as if they have already been classified or designated.

- 1.2.5. Special Areas of Conservation (~~SAC~~) are high-quality conservation sites that have been given strict protection under the Habitats Regulations -to conserve rare and vulnerable animals, plants and habitats (excluding birds) that are listed in Annexes I and II of the Habitats Directive (as amended), which have since been written into the Habitats Regulations.
- 1.2.6. Special Protection Areas (~~SPA~~) are strictly protected sites that have been implemented to protect rare and vulnerable bird species and their populations that are listed in Annexes I and II of the Birds Directive, which have since been written into the Habitats Regulations.
- 1.2.7. European Marine Sites (~~EMS~~) are marine areas protected as SACs or SPAs often managed through underlying Site of Special Scientific Interest (SSSI) or Areas of Special Scientific Interest (ASSI). These areas range from subtidal to intertidal and can comprise the entire SAC or SPA or only part of it.
- 1.2.8. Under Regulation 63 of the Habitats Regulations '*any plan or scheme not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or schemes, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or scheme only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*'.
- 1.2.9. Ramsar sites are wetlands of international importance that have been designated under the Ramsar Convention (1971). Sites are selected for their international significance relating to all ecology, botany, zoology, limnology or hydrology wetland components. The designation recognises the importance of wetlands as economic, social and environmental entities and the need to conserve them. Any activity that may have significant effects on a Ramsar site requires an Appropriate Assessment. Therefore, they are also considered in this screening assessment.
- 1.2.10. It is UK Government policy that Ramsar sites are afforded the same level of protection as Natura 2000 sites and so are referred to alongside SAC and SPA sites within this report as NSN sites.

- 1.2.11. Sites contained within the National Site Network are designated for both Annex I habitat features and Annex II species. Conservation objectives and targets relate to maintaining the integrity of these features.
- 1.2.12. Finally, the Applicant has consulted Natural England throughout the Proposed Scheme's development, including on the HRA process. In their letter dated 10 June 2021 (ref. DAS/343666/354532), Natural England's Discretionary Advice Service stated that "Natural England has reviewed the Report to Inform HRA and finds that the approach to the assessment generally accords with the requirements of the Conservation of Habitats and Species Regulations 2017".

## 2. Habitats Regulations Assessment Methodology

- 2.1.1. The methodology for producing this Screening report follows guidance from Planning Inspectorate Advice Note 10 for the Proposed Scheme of the A47 Wansford to Sutton Dualling in order for a Habitats Regulations Assessment (HRA) to be undertaken. However, the DMRB LA 115 (Habitats Regulations Assessment) standards have also been adopted to aid the production of this Screening report.
- 2.1.2. Stage 1 Screening – determines whether a plan or scheme, either alone or in combination with other plans or schemes, is likely to have a significant effect upon a site within the National Site Network (NSN). If the screening process identifies effects to be significant, potentially significant or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2. The process should apply the precautionary principle to ascertain if significant effects are likely. For Stage 1, Planning Inspectorate Advice Note 5 (Ref: 5.1.24) is used in conjunction with Planning Inspectorate Advice Note 10.
- 2.1.3. Stage 2 Appropriate Assessment – considers the impact on the integrity of sites within the NSN of the Proposed Scheme or plan either alone or in combination with other plans or schemes with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, it assesses the potential mitigation for those impacts.
- 2.1.4. Stage 3 Assessment where no Alternative Solutions exist and where adverse effects remain – assesses compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the plan or scheme should proceed.
- 2.1.5. Each stage determines whether the next stage in the process is required, if for example, it is concluded that at the end of Stage 1 there will be no significant effects on sites within the NSN, there is no requirement to proceed to Stage 2.
- 2.1.6. On the 12 April 2018, a precedent was set by a decision made by the Court of Justice of the European Union (CJEU) in the case of People Over Wind and Sweetman v Coillte Teoranta (C-323/17). The CJEU issued a judgement which ruled that Article 6(3) of the Habitats Directive must be interpreted as meaning that mitigation measures (referred to in the judgment as measures which are intended to avoid or reduce effects) should be assessed within the framework of Appropriate Assessment. As such it is now not permissible to take account of measures intended to avoid or reduce the harmful effects of the plan or project on a European Site at the screening stage. As a consequence, this Screening

report does not take into account mitigation measures, including aspects such as timing restrictions.:

- 2.1.7. This Screening report has been written to support the Environmental Statement (ES) Chapter 8 (Biodiversity) (**TR010039/APP/6.1**), which has been written as part of the Environmental Impact Assessment (EIA). EIA can be defined as an assessment of those consequences of a major project which affect the natural, built and social environment. The Infrastructure Planning (EIA) Regulations 2017 (the EIA Regulations) require an assessment of the effects of certain public and private projects, which are likely to have significant effects on the environment, before development is granted.
- 2.1.8. The ES is a key part of the application documents submitted by Highways England in support of the Development Consent Order (DCO) application for the Proposed Scheme. The overall purpose of the ES is to provide the Planning Inspectorate, members of the public, statutory consultees with information on the predicted effects of the Proposed Scheme and to provide stakeholders with an opportunity to provide additional information and comments. All of this is environmental information that the Secretary of State must then take into account before determining the application for the DCO.
- 2.1.9. The Planning Inspectorate has issued guidance to applicants for DCO in Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects. Advice Note 10 states that when preparing applications for Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008 (as amended), the potential effects upon protected habitats must be considered.
- 2.1.10. If an NSIP, when taken alone or with existing and known future projects, is likely to affect a European Site, the applicant must provide a report with the application showing the sites that may be affected together with sufficient information to enable the competent authority to make an appropriate assessment, if required.

## 2.2. Guidance and standards

- 2.2.1. The screening assessment process which has been used for the production of this report is set out in the Planning Inspectorate Advice Note 10, and the Screening matrices are provided in Appendix C.
- 2.2.2. In addition, to screening matrices to satisfy the standards set out in DMRB LA 115 are provided in tabular format in Appendix A.



### ***Determination of connection with site management***

- 2.2.3. This Screening report will assess whether the works are connected with or necessary to the management of an NSN site.
- 2.2.4. Such works should include those that are:
- 1) for conservation purposes
  - 2) management which is 'directly connected with or necessary' to the site
  - 3) solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.
- 2.2.5. The A47 Wansford to Sutton Dualling Scheme does not fit any of the above criteria.

### ***Examination of the nature of proposed works***

- 2.2.6. The HRA screening assessment shall include a full description of the proposed works including the programme of works.
- 2.2.7. The description of the project shall not include mitigation measures that are introduced to avoid harm to the NSN site or to avoid likely significant effects (LSE) but does include best practice design and construction measures to comply with statutory standards set out by the Environment Agency and Water Framework Directive.

### ***Identification of potential effects on NSN sites***

- 2.2.8. The HRA screening assessment shall include all NSN sites that meet any of the following screening criteria, namely that the development:
- 1) is within 2km—— of an NSN site or functionally linked land<sup>1</sup>
  - 2) is within 30km of a SACs, where bats are noted as one of the qualifying interests
  - 3) crosses or lies adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a NSN site

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<sup>1</sup> Effect pathways on qualifying interests that are mobile species can extend to land occupied outside of the designated site boundary this is defined as functionally linked land

4) has a potential hydrological or hydrogeological linkage to a NSN site containing a groundwater dependent terrestrial ecosystem (GWDTE) which triggers the assessment of NSN sites in accordance with LA 113<sup>2</sup>

5) has an affected road network (ARN) which triggers the criteria for the assessment of NSN sites HA 207 07<sup>3</sup>.

2.2.9. For the purposes of HRA, where the established risk to GWDTE is assessed to be above negligible, further assessment in accordance with LA 113 may be required.

2.2.10. Additional NSN sites should be subject to screening where the existence of ecological connectivity between the project and NSN sites is identified beyond the screening criteria above.

### ***Reporting the outcomes of screening***

2.2.11. The screening stage of HRA shall be reported within an HRA screening report which will include completed screening matrices for all NSN sites which meet the screening criteria.

2.2.12. Screening matrices shall set out the conclusion that either:

- there is an absence of LSE or
- there are LSE

2.2.13. Where the screening assessment concludes that significant effects are likely (alone or in combination) or that sufficient uncertainty remains then further HRA shall be undertaken and reported in the form of a Statement to Inform Appropriate Assessment (SIAA).

2.2.14. This assessment has been completed using the following guidance and standards:

- DMRB LA 115 'Habitats Regulations assessment' Revision 1- (Ref 5.1.8)
- The UK Government's guidance on the use of the Habitats Regulations Assessment
- The Habitats Regulations Assessment Handbook (Ref 5.1.9)
- The European Commission Managing Natura 2000 sites (the Provisions of Article 6 of the Habitats Directive 92/43/EEC (Ref 5.1.13)).

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<sup>2</sup> Highways England. LA 113, 'Road drainage and the water environment'

<sup>3</sup> Highways England. LA 105, 'Air Quality'



- 2.2.15. In addition, Appendix C incorporates guidance set out in Planning Inspectorate Advice Note 10 November 2017 Version 8 (Ref: 5.1.25) and includes the Stage 1 screening matrices which sets out the findings of the DMRB process into the Planning Inspectorate format.
- 2.2.16. The Planning Inspectorate has issued guidance to applicants for Development Consent Orders in Planning Inspectorate (Advice Note 10: Habitats Regulations Assessment (Ref 5.1.25) relevant to nationally significant infrastructure projects. Advice Note 10 states that when preparing applications for Nationally Significant Infrastructure Projects (~~NSIPs~~) under the Planning Act 2008 (as amended), the potential effects upon protected habitats must be considered.
- 2.2.17. If an NSIP, when taken alone or with existing and known future projects, is likely to affect an internationally designated site within the National Site Network (~~NSN~~), which includes site such as Special Areas of Conservation, Special Protected Areas and Ramsar sites, the applicant must provide a report with the application showing the sites that may be affected together with sufficient information to enable the competent authority to make an appropriate assessment, if required.
- 2.2.18. As required in Planning Inspectorate Advice Note 10, this report comprises a Stage 1 screening assessment to ascertain whether the Proposed Scheme is likely to have a significant effect on qualifying features of any NSN site either alone or in-combination with other plans and projects. If Stage 1 identifies significant effects that cannot be excluded on the basis of objective information, then a plan or scheme should be considered to have a likely significant effect and taken through to Stage 2 Appropriate Assessment (AA).
- 2.2.19. As explained in the Planning Inspectorate Advice Note 10 Habitats Regulations Assessment, a set of matrices has been developed to assist the Secretary of State, as the Competent Authority in fulfilling the requirements of the Habitats Directive and the Habitats Regulations in the context of the 2008 Act process. The matrices are intended to clearly present the outcomes at each stage of the process in a standardised tabular form for the benefit of all those involved in the application and examination. The matrices in Appendix C of this report contain the combined outcomes of the process for both the Proposed Scheme and other projects within the Zone of Influence anticipated to result in significant effects that would require additional mitigation in response to cumulative effects.

2.2.20. The matrices comprise:

- Screening Matrices (HRA Stage 1: Screening) - which summarise the screening exercise for Likely Significant Effects of the Proposed Scheme on the European Sites and qualifying features considered.

## **2.3. Assumptions**

2.3.1. Construction is likely to commence in approximately March 2023 and occur for the duration of 18 months.

## 3. Stage 1 screening results

### 3.1. Background

- 3.1.1. In May 1992 European Union member states adopted legislation designed to protect the most seriously threatened habitats and species across Europe.
- 3.1.2. The legislation that protects these sites in the UK is the Conservation of Habitats and Species Regulations 2017 (as amended). Special Protection Areas ~~(SPAs)~~ are protected for rare and vulnerable bird species and Special Areas of Conservation ~~(SACs)~~ are designated for threatened habitats (and species. Sites that are approved by the Government and are in the process of being classified – known as candidate Special Areas of Conservation ~~(cSAC)~~ and potential Special Protection Areas ~~(pSPA)~~ are afforded the same level of protection.
- 3.1.3. Together, SPAs, pSPAs, SACs and cSACs make up the called the National Site Network ~~(NSN)~~.
- 3.1.4. In the UK it is government policy that wetlands of international importance - Ramsar sites - are also considered in the Habitats Regulations Assessment process.

### 3.2. Stage 1 screening: alone

#### Study area

- 3.2.1. A study area of 2km from the Proposed Scheme boundary of the Proposed Scheme was used to identify international sites likely to be affected. A study area of 30km from the Proposed Scheme was used to identify international sites designated for bats. These search areas for designated sites are defined as 2km from the Proposed Scheme in the DMRB LA 115 (Habitats Regulations Assessment (formerly HD 44/09)) as stated: *‘The screening stage of HRA shall be completed for all European sites where a route corridor or project meets any of the following screening criteria:*
- *Is within 2km of a European site or functionally linked land.*
  - *Is within 30km of a SACs, where bats are noted as one of the qualifying interests.*
  - *Crosses or lies adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a European site.*
  - *Has a potential hydrological or hydrogeological linkage to a European site containing a groundwater.*
  - *Dependent terrestrial ecosystem (GWDTE) which triggers the assessment of European sites in accordance with LA 113.*

- *Has an affected road network (ARN) which triggers the criteria for assessment of European sites LA 105.'*

### 3.3. Identification of NSN designated sites

- 3.3.1. NSN sites which have been identified as requiring screening assessment based on the criteria outlined in section 3.2 are set out below.

#### NSN sites within 2km of the proposed works:

- 3.3.2. There are no NSN sites within 2km of the proposed works.

#### NSN sites designated for bats within 30km of the proposed works:

- 3.3.3. There ~~is~~are no NSN sites designated for bats within 30km of the proposed works.

#### NSN sites where any other potential effect pathway exists:

- Nene Washes – Special Protection Area (Ref No. UK9008031) – 10km from the proposed works, but 16.3km from the proposed works through the affect pathway, down the River Nene.
  - Nene Washes – Special Areas of Conservation (Ref No. UK0030222) – 10km from the proposed works, but 16.3km from the proposed works through the affect pathway, down the River Nene.
  - Nene Washes – Ramsar – 10km from the proposed works
- 3.3.4. Nene Washes SPA, SAC and Ramsar is a diffuse site which lies approximately 10km east of the ~~P~~roposed Scheme at its nearest point. The Proposed Scheme is situated upstream of, and adjacent to, the River Nene, which flows into Nene Washes SPA, SAC and Ramsar. While this site does not lie within the route corridor, there is potential for an effect pathways to exist between the route corridor and the Nene Washes SPA, SAC and Ramsar through diffuse pollution and changes in drainage affecting watercourses that flow into the River Nene.
- 3.3.5. A desktop study was undertaken using MAGIC maps to identify any sites within the NSN that could be affected, according to the guidance in section 2.2. From this, it was determined that there is potential for effects pathways to the Nene Washes SAC, SPA and Ramsar.
- 3.3.6. Further information on the designated site including the baseline status of the site's features, vulnerabilities and management plans have been derived from documents contained on the Joint Nature Conservation Committee and Natural England websites. This has included the following sources:
- Site Improvement Plan – Nene Washes

- Conservation Objectives – Nene Washes SAC
- Conservation Objectives – Nene Washes SPA

3.3.7. Appendix D details the vulnerabilities of the NSN sites and Appendix E gives the map showing the NSN within the study area. In addition, Appendix F shows the presence of NSN qualifying features recorded in the study area during the ecological surveys.

### **Other sites - screened out from further assessment**

3.3.7.3.3.8. Rutland Water ~~Ramsar~~ SPA and Ramsar is located 21km to the north-west of the Proposed Scheme. The assessment detailed in Environmental Statement Chapter 13 – Road Drainage and the Water Environment, confirms that there is no likely adverse impact on the hydrology of Rutland Water as a result of this ~~s~~Scheme. A hydrological link between the Proposed Scheme and Rutland Water has been acknowledged within Chapter 13, however this is based on an artificial human link created in respect of water pumping, therefore it is concluded that there will be no impact on the rates of flow in the Nene and no reason that there will be any detrimental impact on the qualifying features of Rutland Water.

### **Nene Washes overview**

3.3.8.3.3.9. The Nene Washes are an extensive mosaic of low-lying wet grassland and rough pasture that lie in the Fens National Character Area of Norfolk and Cambridgeshire. They were created in the 17th century with a primary function to store floodwater from the Nene and protect surrounding land.

3.3.9.3.3.10. They total around 15 square kilometres and are located on the lower reaches of the River Nene, running out eastwards from Peterborough, towards and past Whittlesey, ending at Ringsend. The soils of the washes are slightly base rich peats, alluvial in nature and with a high silt content from the flood waters. For most of the extent of the Washes, the peat soils overlie Oxford clays laid down in the Jurassic Period although the Barroway Drove Beds of marine alluvial deposits would laterally cut out the lower peat. Around the King's Dyke area between Whittlesey and Peterborough, River Terrace Deposits overlying the Oxford Clay provide evidence of former floodplains of the river. These grasslands play a major land drainage role as a flood water storage area and this washland is therefore subject to regular winter flooding. In the summer months the grasslands provide grazing and hay. The regular winter flooding and the continuance of traditional management of cattle grazing and hay cutting maintains the nature conservation value of the area.

3.3.10.3.3.11. When severe winters occur elsewhere in continental Europe, it can force water-birds from these areas to seek a relatively milder climate such as

that found around the Washes. The site can also act as refuge when other nearby areas such as the Ouse Washes are subject to deep and prolonged flooding. During the winter large assemblages of waterfowl can congregate, sometimes in excess of 20,000 birds.

~~3.3.11~~~~3.3.12~~. Many of the ditches hold a rich flora and several nationally scarce plants including fringed water-lily *Nymphoides peltata*, hair-like pondweed *Potamogeton trichoides*, frogbit *Hydrocharis morsus-ranae* and marsh dock *Rumex palustris*. Morton's Leam, a large drainage channel and SAC feature, runs along the southern flank of the washes and contains a high density of spined loach *Cobitis taenia*.

## Nene Washes SAC

~~3.3.12~~~~3.3.13~~. The Nene Washes SAC is a wetland covering an area of 88.19ha and is also designated as a SSSI and is one of the country's few remaining areas of washland habitat. The site is notable for the diversity of plant and associated animal life within its network of dykes. The SAC supports populations of spined loach ~~*Cobitis taenia*~~. Moreton's Leam, a large drainage channel running along the eastern flank of the Nene Washes, contains the highest recorded density of spined loach in the UK.

~~3.3.13~~~~3.3.14~~. The overarching conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site

~~3.3.14~~~~3.3.15~~. A summary of the interest features and their baseline status' have been detailed in Table 3-1 below.

Table 3-1: Interest Features of the Nene Washes SAC

Interest Features	Description	Status (Unit level)
Annex II species that are a primary reason for selection of this site:		
<b>Spined loach</b> <i>Cobitis taenia</i>	The spined loach is one of the UK's smallest freshwater fish, usually reaching no more than 14 centimetres in length. Its name is derived from the two small spines present under each eye. It is a bottom-living fish that has a restricted microhabitat associated with a specialised feeding	<b>Unknown</b>



Interest Features	Description	Status (Unit level)
	<p>mechanism. They use a complex branchial or gill apparatus to filter-feed in fine but well-oxygenated sediments. Optimal habitat is typically standing or slow-moving open water with a patchy cover of submerged (and possibly emergent) plants which are important for spawning during summer, and a sandy or silty substrate into which juvenile fish tend to bury themselves when inactive.</p> <p>Whilst spined loach has a broad European range, in the UK it appears to be restricted to just five east flowing river systems in eastern England – the Rivers Trent, Welland, Witham, Nene and Great Ouse, <u>along</u> with their associated waterways. The fish has limited means of dispersal, so UK populations are largely genetically isolated from each other.</p> <p>The Nene Washes SAC represents spined loach populations within the Nene catchment. Moreton's Leam, a large drainage channel running along the eastern flank of the Nene Washes, contains the highest density of spined loach in the UK. There may also be populations in the smaller ditches of the Washes.</p> <p><del>Moreton's Leam, a large drainage channel running along the eastern flank of the washes, contains a high density of spined loach.</del></p>	

## Nene Washes SPA

~~3.3.15~~ 3.3.16. The Nene Washes SPA covers an area of 1517.4ha, the boundaries of which follow those of the Nene Washes (Whittlesey) SSSI.

~~3.3.16~~ 3.3.17. The Nene Washes is also of importance for a diverse assemblage of breeding birds of wet grasslands, including: redshank *Tringa tetanus*; snipe *Gallinago gallinago*; lapwing *Vanellus vanellus*; mute swan *Cygnus olor*; sedge warbler *Acrocephalus schoenobaenus*; and yellow wagtail *Motacilla flava*.

~~3.3.17~~ 3.3.18. The site has an important role in maintaining the range of several of these species which have been affected by changes in habitat elsewhere in Britain. Also notable is an assemblage of wintering waterfowl including, in addition to species listed above, mute swan, whooper swan *C. cygnus*, mallard *Anas platyrhynchos*, pochard *Aythya ferina*, tufted duck *Aythya fuligula*, shelduck *Tadorna tadorna* and coot *Fulica atra*. A wide range of raptors occur through the year on the Nene Washes, including merlin *Falco columbarius*, hobby *F. subbuteo*, peregrine *F. peregrinus*, marsh harrier *Circus aeruginosus*, hen harrier *C. cyaneus*, sparrowhawk *Accipiter nisus*, short-eared owl *Asio flammeus*, long-eared owl *A. otus*, and barn owl *Tyto alba*.

~~3.3.18~~ 3.3.19. During severe winter weather elsewhere, the Nene Washes can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available. It can also assume greater importance at times on deep flooding on the nearby Ouse Washes when it holds displaced birds. Over winter, the area regularly supports 25,437 individual waterfowl (5-year peak mean 1991/2 -

1995/6) including: Black-tailed godwit, teal *Anas crecca*, gadwall *Anas strepera*, wigeon *Mareca penelope*, shoveler *Anas clypeata*, pintail *Anas acuta*, and Bewick's swan *Cygnus columbianus bewickii*.

~~3.3.19~~ **3.3.20.** The overarching conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

~~3.3.20~~ **3.3.21.** A summary of the interest features and their baseline status' have been detailed in Table 3-12 above.

Table 3-2: Interest Features of the Nene Washes SPA

Interest Features	Description	Status (Unit level)
<b>Breeding</b>		
<b>Gadwall</b> <i>Anas strepera</i>	The site supported 25 breeding pairs at the time of SPA notification, 5% of the British population. UK breeding numbers have been increasing generally in the last few decades, and also in the close continent. The mean population count in the period 2013-17 was 86 pairs.	Unknown
<b>Garganey</b> <i>Anas querquedula</i>	The site supported 5 breeding pairs at the time of notification, 10% of the British population. UK breeding numbers have increased slightly in the last 25 years. The mean population count in the period 2013-17 was five pairs.	Unknown
<b>Northern shoveler</b> <i>Anas clypeata</i>	The site supported 36 breeding pairs at the time of notification, representing 3% of the British population. The mean population count in the period 2013-17 was 68 pairs. Breeding numbers in the UK have been stable in the last 10 years but there has been an increase since designation.	Unknown
<b>Black-tailed godwit</b> <i>Limosa limosa limosa</i>	The site supported 16 breeding pairs at the time of notification, representing 30% of the British population. The population on the Nene Washes has increased as the nearby population on the Ouse Washes decreased, peaking at 48 pairs in 2006. An increase in the levels of predation has caused productivity to plummet, but the long life-expectancy of the adults means that the mean population count in the period 2013-17 is still 40 pairs. This represents the majority of breeding pairs in the UK.  The species nests on the Low Wash almost without exception, although in recent years there have been relays on March Farmers and past nesting on Ring's End.	Unknown
<b>Non-breeding</b>		



Interest Features	Description	Status (Unit level)
<b>Bewick's swan</b> <i>Cygnus columbianus bewickii</i>	The site supports more than 7% of the north-west European wintering population. The peak 5 year mean from 2013/14 – 2017/18 was 431. Both the north-west European population and numbers occurring within Britain have declined substantially during the last 20 years. This is thought to be at least in part due to milder winters causing fewer birds to travel as far west as in previous years. Other influences on population dynamics have been identified as climate change, disease, illegal/accidental shooting and a diminished food resource and human disturbance on overwintering sites. Numbers of Bewick's swans on the Nene Washes have held up well in comparison with the national trend. Swans tend to spend the daytime foraging on functionally linked arable land around the SPA, as well as on the SPA itself, returning to the SPA to roost on open water at night. Roosting sites can be dependent on water levels in the Washes and will change throughout the season.	Unknown
<b>Eurasian wigeon</b> <i>Mareca penelope</i>	The site supported 3640 individuals at notification, 1% of the British population. The peak 5 year mean from 2013/14 – 2017/18 was 13864. As stated in the conservation objectives produced by Natural England, the increases could be due to the more suitable management of March Farmers and sub-optimal flooding conditions at the Ouse Washes leading birds to move between sites <sup>4</sup> . Numbers in Britain have increased by about two thirds since the SPA was notified. Wigeon preferentially feed on grassland within the SPA, roosting on open water. Both feeding and roosting areas will be dependent on water levels and wildfowling and will change throughout the season.	Unknown
<b>Gadwall</b> <i>Anas strepera</i>	The site supported 95 individuals at notification, over 1% of the British population. The peak 5 year mean from 2013/14 – 2017/18 was 247. Nationally, the population has approximately doubled over the same period. Gadwall is a dabbling duck requiring shallow water for feeding; feeding and roosting areas will be dependent on water levels and wildfowling and will change throughout the season.	Unknown
<b>Eurasian teal</b> <i>Anas crecca</i>	The site supported 980 individuals at notification, 1% of the British population. The peak 5 year mean from 2013/14 – 2017/18 was 2857. Since notification, the national population has increased by approximately a half. Teal prefers shallow water for feeding; feeding and roosting areas will be dependent on water levels and wildfowling and will change throughout the season.	Unknown
<b>Northern pintail</b> <i>Anas acuta</i>	The site supported 440 individuals at notification, over 1% of the British population. The peak 5 year mean from 2013/14 – 2017/18 was 646. Numbers have fluctuated but have held up well compared to the national trend, which has seen a small decline over the same period for reasons that aren't well understood. Numbers at the Nene Washes were generally much higher from the late 1990s until about 2010.	Unknown
<b>Northern shoveler</b> <i>Anas clypeata</i>	The site supported 110 individuals at notification, over 1% of the British population. The peak 5 year mean from 2013/14 – 2017/18 was 475. Numbers nationally have doubled over the same period.	Unknown

<sup>4</sup> There is no direct hydrological pathway between Nene Washes and the Ouse Washes with a distance in excess of 15km between the two sites. There is no supporting ringing evidence from the British Trust for Ornithology which support the statement that there is a movement direct between the two sites. It can be assumed that as the water levels vary throughout the wintering months flocks of wildfowl will move throughout site in Cambridgeshire, East Anglia and Lincolnshire to utilise optimal feeding habitats and not just directly between these two sites.

~~3.3.21~~3.3.22. The most important area for breeding wetland birds, including the duck species above, on the Nene Washes is the Low Wash (unit 3), with March Farmers becoming increasingly important since restoration from arable land to grassland in 2015. The High Wash (unit 2), Eldernell (unit 4) also support important numbers, while Ring's End, at the higher end of the washes, can be important in some years depending on climatic conditions. Stanground (unit 1), with its drained gravel substrate, and Garner (unit 5), which is largely arable, generally do not support nesting wetland birds.

## Nene Washes Ramsar

~~3.3.22~~3.3.23. The Nene Washes Ramsar covers an extensive area of 1517ha of seasonally flooded wet grassland along channelized river reaches. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented. The site is important for various species of breeding and wintering waterbirds. A refuge for birds displaced by excessive floodwaters, the site's international importance will only be retained by the preservation of winter flooding and high summer water tables.

~~3.3.23~~3.3.24. A mixture of largely arable land and agriculturally improved, floristically poor grassland. The latter being dominated by species such as common couch *Elymus repens*, rough meadow-grass *Poa trivialis* and tufted hairgrass *Deschampsia cespitosa*. Areas of more structurally diverse grassland exist containing a range of grasses, sedges and rushes. Species of frequent occurrence include common spike-rush *Eleocharis palustris*, floating sweet-grass *Glyceria fluitans*, greater sweet-grass *Glyceria maxima*, reed canary grass *Phalaris arundinacea*, marsh foxtail *Alopecurus geniculatus* and soft rush *Juncus effusus*. A couple of small semi-natural grassland areas are also present. The washlands are used for the seasonal uptake of floodwaters and traditionally, cattle grazing in summer months. The mosaic of rough grassland and wet pasture provide a variety of habitats for breeding and feeding birds. Many of the ditches hold a rich flora and several nationally scarce plants including fringed water-lily *Nymphoides peltata*, hair-like pondweed *Potamogeton trichoides* and marsh dock *Rumex palustris*.

~~3.3.24~~3.3.25. The overarching conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to the Birds and Habitats Directives by achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species

- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site

~~3.3.25~~ 3.3.26. A summary of the interest features and their baseline status' have been detailed in Table 3-13 above.

Table 3-3: Interest Features of the Nene Washes Ramsar

Interest Features	Description	Status (Unit level)
<b>Internationally Important Assemblages</b>		
<b>Bewicks swan</b> <i>Cygnus columbianus bewickii</i>	Winter: 694 individuals, representing an average of 2.3% of the population (5 year peak mean 1998/9- 2002/3)	Unknown
<b>Possible future designation – Northern pintail</b> <i>Anas acuta</i>	Winter: 1848 individuals, representing an average of 3% of the population (5 year peak mean 1998/9- 2002/3)	Unknown
<b>Possible future designation – Black-tailed godwit</b> <i>Limosa limosa limosa</i>	Spring and Autumn: 482 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9- 2002/3 - spring peak)	Unknown
<b>Non-breeding</b>		
<b>Whooper swan</b> <i>Cygnus cygnus</i>	80 individuals, representing an average of 1.3% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown
<b>Eurasian wigeon</b> <i>Mareca penelope</i>	9651 individuals, representing an average of 2.3% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown
<b>Pochard</b> <i>Aythya ferina</i>	1795 individuals, representing an average of 3% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown
<b>Eurasian teal</b> <i>Anas crecca</i>	2015 individuals, representing an average of 1% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown
<b>Golden plover</b> <i>Pluvialis apricaria apricaria</i>	2949 individuals, representing an average of 1.1% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown
<b>Ruff</b> <i>Philomachus pugnax</i>	98 individuals, representing an average of 14% of the GB population (5-year peak mean 1998/9- 2002/3)	Unknown

3.3.27. Notably criterion 2 refers to the site supporting ‘an important assemblage of nationally rare breeding birds. The site also supports several nationally scarce plants, and two vulnerable and two rare British Red Data Book invertebrate species have been recorded’.

3.3.28. The four vulnerable and rare invertebrates are described as the aquatic snail *Valvata macrostoma*, the water beetle *Agabus undulatus*, the dragonfly *Libellula fulva* and the hoverfly *Anasimyia interpuncta* however there is no further information regarding the populations of these invertebrates present on the RAMSAR site.

3.3.29. The scarce plants are described as **fringed waterlily** *Nymphoides peltata*, *Potamogeton trichoides*, *Rumex palustris*, **flat-stalked pondweed** *Potamogeton friesii*, **narrow-leaved water plantain** *Alisma lanceolatum* and **sea barley** *Hordeum marinum* however there is no further information regarding ~~the these of these plants on~~ **at** the RAMSAR site.

3.3.30. There is no further information provided regarding the nationally rare breeding birds recorded on site.

~~3.3.26-3.3.31.~~ In addition, four vulnerable or rare invertebrates have been recorded: the aquatic snail *Valvata macrostoma*, the water beetle *Agabus undulatus*, the **scarce chaser** dragonfly *Libellula fulva* and the hoverfly *Anasimyia interpuncta*.

### **3.4. Ecological baseline of Proposed ~~scheme~~Scheme** **Background**

- 3.4.1. An Extended Phase 1 Habitat survey was undertaken in May 2016, in order to assess the ecological importance of the site and determine the requirement for further protected species surveys.
- 3.4.2. Further ecological surveys have been undertaken since 2017 to inform the environmental statement as part of the environmental impact assessment for the Proposed Scheme. These surveys provide a baseline of ecological data to help quantify the importance of the study area<sup>5</sup> for species and habitats. This data helps inform the project design and assists in developing an understanding of the presence of protected or notable species. The data below has been curtailed to those relevant to produce this HRA. Full details and results of all the

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<sup>5</sup> The study area is defined within the EAR and can vary depending upon the ecological receptor. For all ecological receptors the study area includes the red-line boundary plus an appropriate buffer for that receptor.



ecological studies can be found in the Environmental Assessment Report for the A47 Wansford to Sutton project.

**3.4.3.** The existing baseline scenario refers to the conditions that currently exist, as surveyed between 2016 and 2020, in the area within which the Proposed Scheme would be implemented. The surveys relevant to this report are detailed below and summarised in

**3.4.3.3.4.4.** Table 3-4.

Table 3-4 Summary of relevant ecological surveys undertaken

Biodiversity resource	Methodology	Distance from the Proposed Scheme boundary	Dates of surveys
Phase 1 Habitat Assessment / Preliminary Ecological Appraisal (including invasive species surveys)	JNCC's Handbook for Phase 1 habitat survey - a technique for environmental audit (JNCC, 2010) CIEEM's Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017)	50m	May 2016. Habitat updates recorded during Phase 2 surveys in 2020.
Wintering bird surveys	Bibby <i>et al.</i> 2000	500m	October 2017 to March 2018 January and February 2020
Breeding bird surveys	Bibby <i>et al.</i> 2000	500m	April – June 2018 March 2020
Aquatic invertebrate surveys (spined loach)	Drake <i>et al.</i> , 2007	Within Proposed Scheme boundary	May 2018

**3.4.4.3.4.5.** Full results of these surveys undertaken are detailed in ES (Chapter 8) Biodiversity (**TR010039/APP/6.1**).

## Principal habitats

**3.4.5.3.4.6.** The Phase 1 habitat survey data detailed in ES Chapter 8 (Biodiversity) (**TR010039/APP/6.1**) indicates that the main habitat in the area is arable farmland and semi-improved grassland. There are some areas of woodland to the south of the A47, and Along A1, to the western side of Sacrewell Farm road, south of A47. Swamp habitat occurs between the A47 and River Nene, to the east of the petrol station.

## Protected species

### Wintering birds

3.4.6-3.4.7. Overwintering bird surveys were undertaken once a month, for ~~6-six~~ months between October 2017 and March 2018. The surveys recorded a total of five Schedule 1 species<sup>6</sup>, twelve red listed species, fifteen Amber listed species, two of which are Nene Washes SPA and Ramsar qualifying species (teal ~~Anas crecca~~ and gadwall ~~Anas strepera~~).

3.4.7-3.4.8. Five Schedule 1 species were recorded during the overwintering bird surveys: fieldfare (~~Turdus pilaris~~), redwing (~~Turdus iliacus~~), woodlark (~~Lullula arborea~~), kingfisher and red kite Milvus milvus.

3.4.8-3.4.9. Wintering bird surveys were undertaken in January and February 2020. Two SPA qualifying species, gadwall and teal, were recorded. Gadwall were recorded on two separate occasions in January (with two and four individuals) and on occasion in February (with two individuals), and two individuals of teal were recorded in January. Teal is also a Ramsar qualifying species. In addition, a larger group of 30 golden plover, which is a Ramsar qualifying species, were recorded on January 2020.

### Breeding birds

3.4.9-3.4.10. The breeding bird surveys were undertaken between April and June 2018, each lasting ~~2-two~~ days. Three Schedule 1 species were recorded: goshawk (~~Accipiter gentilis~~), kingfisher (~~Alcedo atthis~~) and red kite (~~Milvus milvus~~). In total 70 species were recorded during the breeding bird surveys, these included 35 species of Birds of Conservation Concern (fifteen Red & twenty Amber)<sup>7</sup>

3.4.10-3.4.11. Only one of the species recorded during the breeding bird surveys is an SPA qualifying species: teal (~~Anas crecca~~).

3.4.11-3.4.12. There have been high levels of activity for a variety of species near to the Wittering Brook and River Nene watercourses and their associated riparian habitat, highlighting the importance of these corridors. Agricultural areas on the north eastern section of the study area showed relatively low levels of bird activity, with few numbers of species present.

<sup>6</sup> Species protected under Schedule 1 of the Wildlife and Countryside Act (WCA) 1981, as amended

<sup>7</sup> Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746

~~3.4.12~~~~3.4.13~~. \_\_\_\_\_ None-native bird species recorded during the survey included Canada goose *Branta canadensis*, pheasant *Phasianus colchicus* and red-legged partridge *Alectoris rufa*.

~~3.4.13~~~~3.4.14~~. \_\_\_\_\_ Breeding bird surveys were carried out in March to June (inclusive) 2020. One SPA qualifying species, gadwall, was found in pairs on three occasions, and one Ramsar qualifying species, golden plover, was found as a flock of 80 individuals.

### *Migrating birds*

~~3.4.14~~~~3.4.15~~. \_\_\_\_\_ Autumn passage surveys were undertaken between September and October 2017.

~~3.4.15~~~~3.4.16~~. \_\_\_\_\_ During the above surveys one species designated under Schedule 1, was recorded (red kite ~~*Milvus milvus*~~), six red listed species and eight amber listed species.

~~3.4.16~~~~3.4.17~~. \_\_\_\_\_ No autumn passage surveys were undertaken in 2020 as, from the results of the 2017 surveys, these were considered to not be required.

### *Fish*

~~3.4.17~~~~3.4.18~~. \_\_\_\_\_ Previous aquatic invertebrate surveys were carried out on the River Nene in May 2018, to monitor the abundance of species of conservation interest, including spined loach ~~*Cobitis taeni*~~.

~~3.4.18~~~~3.4.19~~. \_\_\_\_\_ During the survey, a single qualifying species for Nene Washes SAC was recorded: spined loach (~~*Cobitis taeni*~~), however no population assessment was carried out. The report concluded that no impacts were to be anticipated on this species as the result of the Proposed Scheme.

~~3.4.19~~~~3.4.20~~. \_\_\_\_\_ There is no known data published on the existing population size within the SAC other than the Nene Washes contains the highest recorded density of spined loach ~~*Cobitis taeni*~~ in the UK.

### **Other notable species**

3.4.1. In addition, ad hoc records of invasive species were received throughout, during other Phase 2 surveys. Those species which have been identified on site and are cited on Schedule 9 of the Wildlife and Countryside Act (1981) are:

- Himalayan Balsam (~~*Impatiens glandulifera*~~)

- 3.4.2. Scattered stands of Himalayan balsam were identified along two watercourses within the Proposed Scheme boundary and is considered unlikely to be affected by the selected route option.

### 3.5. Stage 1 screening: in combination

- 3.5.1. For the purposes of this assessment, developments have been divided into two categories as follows:
- a single project (the Proposed Scheme), which considers numerous different effects impacting a single receptor
  - different projects, in combination with the Proposed Scheme.
- 3.5.2. The assessment of cumulative effects is fully detailed in ES Chapter 15 (Cumulative Effects) (**TR010039/APP/6.1**) and is summarised below.

#### *Single project effects*

- 3.5.3. All potential single project effects are presented in Table A.1 in Appendix A. Further details of potential effects are shown in Appendix B

#### *Different project effects*

- 3.5.4. The Zone of Influence (ZOI) and shortlist of developments is shown in ES Chapter 15 (Cumulative effects) (**TR010039/APP/6.1**). The assessment follows the methodology in Chapter 15.

#### *In-combination effects*

- 3.5.5. Only developments within the 2km ZOI which have scoping reports or environmental statements available are classified as Tier 1 developments. Within the 2km ZOI surrounding the Proposed Scheme boundary there are no major developments which have a scoping report available on the planning portal, therefore there are no developments which have been deemed to require further assessment and there is no potential for different project effects within this ZOI. Developments within the area have been informed by the 'Uncertainty Log' used to produce the Traffic Forecasting Package Report for the Proposed Scheme, and the major developments listed on the National Infrastructure Planning website.
- 3.5.6. The Peterborough City Council Local Plan 2016- 2036 (2019) and the Huntingdonshire District Council Local plan to 2036 (2019) informs the preparation of the Local Plans for these locations and identifies areas that the Council understands to be available for development. Review of these documents show there to be no land allocated for development within 2km of the Proposed Scheme.



- 3.5.7. None of the other sections of the A47 improvements programme are close enough to consider an in-combination effect on the Nene Washes SAC, SPA and Ramsar.

### 3.6. Limitations

- 3.6.1. The detailed design stage of the Proposed Scheme is not yet complete. To reduce limitations associated with this, the assessment will consider potential effects based on the precautionary principle. The Screening report is based on assumptions that construction will comply with legal requirements on a statutory basis, such as pollution prevention and control.

### 3.7. Consultation with Natural England (NE)

- 3.7.1. The conclusions of the screening exercise undertaken in February 2020 were discussed with the NE Lead Advisor for the Norfolk and Suffolk Team. It was agreed that as the Assessment of Implications on European Sites report produced in 2017 was preliminary and based on information available to date that the screening exercise should be updated and reviewed as the Proposed Scheme progresses. This Screening report demonstrates compliance with this advice.
- 3.7.2. Natural England were consulted on the HRA and comment was received from Natural England in response on 10<sup>th</sup> June 2021 (Appendix G) **(TR010039/APP/6.3)**. Natural England confirmed that they agreed with our findings of no likely significant effect, however they requested further detail to clarify our position, which has been provided as a letter in response (Annex B). Any comments and recommendations will be reflected during further updates of this assessment.

## 4. Screening summary and conclusion

- 4.1.1. This Screening report has identified potential for potential effect pathways between the Proposed Scheme at Wansford to Sutton on the Nene Washes SAC, SPA and Ramsar.
- 4.1.2. Following a review of the potential threats and pressures to the Nene Washes SAC, SPA and Ramsar, the works being undertaken, and evidence gathered within the environmental statements, Potential Effects screening matrices were developed in accordance with Planning Inspectorate Advice Note 10 (Tables C-2 to C-5).
- 4.1.3. As discussed in the screening matrices presented in Appendix A, the screening process highlighted the main threats and pressures to the key indicators of conservation value upon the Nene Washes SAC, SPA and Ramsar. The screening process assessed each potential affect to conclude whether they would cause a likely significant effect on the features associated with sites.
- 4.1.4. The Stage 1 Screening Assessment therefore concluded that there will be No Likely Significant Effect on the Nene Washes SAC, SPA and Ramsar from the Proposed Scheme. These findings are summarised in the LA 115 Matrix tables (Tables 4-1 to 4-3) below.

Table 4-1 Finding of no significant effects report matrix (Screening) Nene Washes SPA

<b>Project Name</b>	<b>A47 Wansford to Sutton Dualling</b>	
<b>European Site under consideration</b>	Nene Washes SPA	
<b>Date</b>	<b>Author (Name/Organisation)</b>	<b>Verified (Name/Organisation)</b>
27.01.2021	Ishbel Campbell	Keith Ross, Sweco
<b>Name and location of European Site:</b>	Nene Washes – Special Protection Area (Ref No. UK9008031), Location: 10km from the Proposed Scheme for terrestrial species and 16.3km downstream for aquatic species	
<b>Description of the project:</b>	<p>A47 Wansford to Sutton improvement works:</p> <ul style="list-style-type: none"> <li>The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordinance Survey Grid Reference at the approximate centre of the Proposed Scheme is TF TL 09020 99571.</li> <li>Works will be based between the A1/A47 Wansford junction and Nene Way roundabout.</li> <li>Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li> <li>Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (TR010039/APP/7.3).</li> <li>The Development Consent Order (DCO) boundary is provided in Appendix E (Figure 1).</li> <li>The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO.</li> </ul>	

Is the project directly connected with or necessary to the management of the site (provide details)?	No
Are there other projects or plans that together with the project being assessed could affect the site (provide details)?	No
<b>The assessment of significance of effects</b>	
Describe how the project (alone or in combination) is likely to affect the European Site.	<p><b>Pollution of watercourses</b></p> <p><b>Air pollution</b></p> <p><b>Noise and vibration disturbance</b></p> <p><b>Visual disturbance</b></p> <p><b>Light disturbance</b></p>
Explain why these effects are not considered significant.	<p><b>Water Pollution:</b> There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.</p> <p>In addition, the River Nene Ramsar lies approximately 16.3km downstream from where the Proposed Scheme is closest to the River Nene. With best practice design and construction measures in place, and with works following the monitoring and Drainage Strategy (ES Chapter 13 (Road drainage and water environment) (TR010039/APP/6.1) that will be in place, it is considered that there will be <b>no likely significant effects</b> that will occur on the SPA or the qualifying features during construction or operation.</p> <p>Only two bird species which are designated features of the Nene Washes SPA were found in the wintering and breeding bird surveys over the study area. In addition, these species were found in such small numbers that it is highly unlikely that these individuals are part of the populations within the SPA and Ramsar site. Therefore, it can be concluded that there will be <b>no likely significant effects</b> upon the populations within the Nene Washes SPA.</p> <p><b>Air Quality:</b> Air quality modelling has been undertaken. It is anticipated that the change in air quality within the SPA site would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SPA or the qualifying features during construction or operation as the site lies 16.3km downstream (aquatic species) and 10km (terrestrial species) to the east of the site, with the city of Peterborough between the Proposed Scheme and the SPA site.</p> <p>Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be <b>no likely significant effects</b> upon the Nene Washes SPA during construction.</p> <p>During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be no likely significant effects upon the Nene Washes SPA, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.</p> <p><b>Noise and vibration disturbance:</b> Noise modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SPA or the qualifying features during construction or operation as the site lies 16.3km downstream and 10km to the east of the site, with the city of Peterborough between the Proposed Scheme and the Ramsar site.</p> <p>Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be no LSE upon the Nene Washes SPA as a result of construction traffic or construction noise and vibration.</p> <p>Designated features from the Nene Washes SPA recorded within the study area include gadwall, teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be no LSE upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.</p>



	<p><b>Visual disturbance:</b> The proposed works will be 10km from the SPA (terrestrial species) and 16.3km upstream of the SPA (aquatic species), with the city of Peterborough between the Proposed Scheme and the SPA site. In addition no large populations of any qualifying species were recorded on site and therefore no additional impact <u>in respect of visual disturbance</u> is expected. <u>No likely significant effects on the SPA or it's qualifying features are anticipated.</u></p> <p><b>Light disturbance:</b></p> <p>Construction: Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required. In addition, construction is due to be undertaken over the short duration of 18 months.</p> <p>Operation: The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SPA or the qualifying features during construction or operation.</p>		
List of agencies consulted: provide contact name and telephone or e-mail address.	Natural England (Ryan Rees, Lead Adviser – Sustainable Development) commercialservices@naturalengland.org.uk		
Response to consultation	Natural England agree to the conclusion of no Likely Significant Effect (Appendix G) (TR010039/APP/6.3).		
<b>Data collected to carry out the assessment</b>			
Who carried out the assessment	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed?
All information on the assessment process and data used for the assessment is set out in the full assessment report:			

Table 4-2 Finding of no significant effects report matrix (Screening) Nene Washes SAC

Project Name	A47 Wansford to Sutton Dualling	
European Site under consideration	Nene Washes SAC	
Date	Author (Name/Organisation)	Verified (Name/Organisation)
27.01.2021	Ishbel Campbell	Keith Ross, Sweco
Name and location of European Site:	Nene Washes – Special Areas of Conservation (Ref No. UK0030222) Location: approximately 10km from the Proposed Scheme for terrestrial species and 16.3km downstream for aquatic species	
Description of the project:	A47 Wansford to Sutton improvement works: <ul style="list-style-type: none"><li>The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordinance Survey Grid Reference at the approximate centre of the <u>P</u>roposed <u>S</u>cheme is TF TL 09020 99571.</li><li>Works will be based between the A1/A47 Wansford junction and Nene Way roundabout.</li><li>Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li><li>Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (TR010039/APP/7.3).</li><li>The Development Consent Order (DCO) boundary is provided in Appendix E (Figure 1).</li></ul>	

	<ul style="list-style-type: none"> <li>The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO</li> </ul>
Is the project directly connected with or necessary to the management of the site (provide details)?	No
Are there other projects or plans that together with the project being assessed could affect the site (provide details)?	No
<b>The assessment of significance of effects</b>	
Describe how the project (alone or in combination) is likely to affect the European Site.	<b>Air Quality</b> <b>Pollution of watercourse</b> <b>Vibration disturbance of SAC designated species (Spined Loach)</b> <b>Lighting disturbance</b>
Explain why these effects are not considered significant.	<p><b>Air Quality</b></p> <p>Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be <b>no likely significant effects</b> <del>no LSE</del> upon the Nene Washes SAC during construction.</p> <p>During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be <b>no likely significant effects upon the Nene Washes SAC</b>, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.</p> <p><b>Water Pollution</b> – There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.</p> <p>In addition, the River Nene SAC lies approximately 16.3km downstream from where the Proposed Scheme is closest to the River Nene. With best practice design and construction measures in place, and with works following the monitoring and Drainage Strategy ES Appendix 13.2 (TR010039/APP/6.2) that will be in place, it is considered that there will be no likely significant effects that will occur on the SAC or the qualifying features during construction or operation. Spined loach were found in one location on the River Nene in 2017 and has not been found in any subsequent surveys. Therefore, it can be concluded that it is unlikely that this individual was from the population in the Nene Washes SAC. Therefore, any changes in water quality in the River Nene will have <b>no likely significant effects</b> upon the population or the water quality in the Nene Washes SAC, which lies 16.3km downstream of the proposed works.</p> <p><b>Noise and Vibration</b> – Vibration modelling has been undertaken. It is anticipated that the vibration levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SAC or the qualifying features during construction or operation.</p> <p>Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be <b>no likely significant effects</b> <del>no LSE</del> upon the Nene Washes SAC as a result of construction traffic or construction noise and vibration.</p> <p>Designated features from the Nene Washes recorded within the study area include spined loach. This species does not occur frequently, or in great numbers which therefore suggests that spined loach are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be <b>no likely significant effects</b> <del>no LSE</del> upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.</p> <p><b>Light disturbance</b></p> <p>Construction: Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required.</p>

	Operation: The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SAC or the qualifying features during construction or operation.		
List of agencies consulted: provide contact name and telephone or e-mail address.	Natural England (Ryan Rees, Lead Adviser – Sustainable Development) commercialservices@naturalengland.org.uk		
Response to consultation	Natural England agree to the conclusion of no Likely Significant Effect (Appendix G) (TR010039/APP/6.3).		
<b>Data collected to carry out the assessment</b>			
Who carried out the assessment	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed?
All information on the assessment process and data used for the assessment is set out in the full assessment report:			

Table 4-3 Finding of no significant effects report matrix (Screening) Nene Washes Ramsar

<b>Project Name</b>	<b>A47 Wansford to Sutton Dualling</b>	
<b>European Site under consideration</b>	Nene Washes Ramsar	
<b>Date</b>	<b>Author (Name/Organisation)</b>	<b>Verified (Name/Organisation)</b>
27.01.2021	Ishbel Campbell	Keith Ross, Sweco
<b>Name and location of European Site:</b>	Nene Washes Ramsar Location: approximately 10km from the Proposed Scheme for terrestrial species and 16.3km downstream for aquatic species.	
<b>Description of the project:</b>	A47 Wansford to Sutton improvement works: <ul style="list-style-type: none"> <li>The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordinance Survey Grid Reference at the approximate centre of the <del>P</del>roposed <del>S</del>cheme is TF TL 09020 99571.</li> <li>Works will be based surrounding A1/A47 Wansford junction and Nene Way roundabout.</li> <li>Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li> <li>Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (TR010039/APP/7.3).</li> <li>The Development Consent Order (DCO) boundary is provided in Appendix E (Figure 1).</li> <li>The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO</li> <li>Traffic volume will remain unchanged</li> </ul>	
<b>Is the project directly connected with or necessary to the management of the site (provide details)?</b>	No	



Are there other projects or plans that together with the project being assessed could affect the site (provide details)?	No
<b>The assessment of significance of effects</b>	
Describe how the project (alone or in combination) is likely to affect the European Site.	<p><b>Pollution of watercourses</b></p> <p><b>Air pollution</b></p> <p><b>Noise disturbance of Ramsar features</b></p> <p><b>Light disturbance of Ramsar features</b></p> <p><b>Spread of Invasive Non-native Species</b></p>
Explain why these effects are not considered significant.	<p><b>Water Pollution:</b> There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.</p> <p>Only three bird species which are designated features of the Nene Washes Ramsar site were found in the wintering and breeding bird surveys over the study area. In addition, these species were found in such small numbers that it is highly unlikely that these individuals are part of the populations within the Ramsar site. Therefore, it can be concluded that there will be <b>no likely significant effects</b> upon the populations within the Nene Washes Ramsar site.</p> <p><b>Air Quality:</b> Air quality modelling has been undertaken. It is anticipated that the change in air quality within the Ramsar site would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the Ramsar or the qualifying features during construction or operation as the site lies 16.3km downstream (aquatic species) and 10km (terrestrial species) to the east of the site, with the city of Peterborough between the Proposed Scheme and the Ramsar site.</p> <p>Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be no LSE upon the Nene Washes Ramsar site during construction.</p> <p>During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be <b>no likely significant effects</b> upon the Nene Washes Ramsar site, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.</p> <p><b>Noise and vibration:</b> Noise modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the Ramsar or the qualifying features during construction or operation as the site lies 16.3km downstream and 10km to the east of the site, with the city of Peterborough between the Proposed Scheme and the Ramsar site.</p> <p>Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be no LSE upon the Nene Washes Ramsar as a result of construction traffic or construction noise and vibration.</p> <p>Designated features from the Nene Washes recorded within the study area include gadwall, teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be <b>no likely significant effects</b> upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.</p> <p><b>Visual disturbance:</b> The proposed works will be 10km from the Ramsar site (terrestrial species) and 16.3km upstream of the Ramsar site (aquatic species), with the city of Peterborough between the Proposed Scheme and the Ramsar site. In addition no large populations of any qualifying species were recorded on site and therefore <b>no likely significant effects</b> are expected.</p> <p><b>Light disturbance:</b> Construction: Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required.</p> <p>Operation: The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented</p>

	perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the Ramsar or the qualifying features during construction or operation.  <u><a href="#">Invasive Non Native Species (INNS): The spread of INNS onsite will be prevented through standard construction best practice; this will include strict biosecurity measures as detailed in the Environmental Management Plan (EMP) (REAC, BD 6).</a></u>		
List of agencies consulted: provide contact name and telephone or e-mail address.	Natural England (Ryan Rees, Lead Adviser – Sustainable Development) commercialservices@naturalengland.org.uk		
Response to consultation	Natural England agree to the conclusion of no Likely Significant Effect (Appendix G) (TR010039/APP/6.3).		
<b>Data collected to carry out the assessment</b>			
Who carried out the assessment	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed?
All information on the assessment process and data used for the assessment is set out in the full assessment report:			



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## Appendix A. DMRB Screening matrix

Potential effects upon the designated sites which are considered in this assessment are provided below in Table A.1 to be in line with DMRB LA 115 (Habitats Regulations Assessment):

The European sites included within the screening assessment are the:

- Nene Washes SAC
- Nene Washes SPA
- Nene Washes Ramsar

These have been assessed using the screening matrices in Tables A-1 to A-4, which follow the format taken from Appendix A: Screening Matrices, DMRB LA115 Habitats Regulations assessment.

Table A-1 Nene Washes SAC Screening Matrix

<b>Project Name:</b>	A47 Wansford to Sutton Dualling	
<b>European site under consideration</b>	Nene Washes SAC	
<b>Date:</b>	<b>Author (Name/Organisation):</b>	<b>Verified (Name/Organisation):</b>
January 2021	Ishbel Campbell, Sweco	Keith Ross, Sweco
<b>Description of project</b> Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
<b>• Size and scale (road type and probable traffic volume)</b>	A47 Wansford to Sutton improvement works: <ul style="list-style-type: none"> <li>• The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordnance Survey Grid Reference at the approximate centre of the <del>P</del>roposed <del>S</del>scheme is TF TL 09020 99571. This 2.5km of single carriageway forms a part of the main arterial highway route connecting Norwich with Great Yarmouth to the east.</li> <li>• Works will be based surrounding A1/A47 Wansford junction and Nene Way roundabout.</li> <li>• Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li> <li>• Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (TR010039/APP/7.3).</li> <li>• The Development Consent Order (DCO) boundary is provided in Appendix E (Figure 1).</li> <li>• The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO</li> <li>• Traffic volume will remain unchanged</li> </ul>	
<b>• Land-take</b>	The Proposed Scheme boundary is provided in Appendix E (Figure 1). No land-take is required in the SAC. The Proposed Scheme land-take is currently unknown as designs are still being finalised.	

<ul style="list-style-type: none"><li>Distance from the European Site or key features of the site (from edge of the project assessment corridor)</li></ul>	Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species.
<ul style="list-style-type: none"><li>Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)</li></ul>	Not applicable as no land-take from the Nene Washes SAC is required.
<ul style="list-style-type: none"><li>Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)</li></ul>	<p>Construction: Nitrogen dioxide from diesel-powered plant during construction. Proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Potential for spills during refuelling and machine servicing. Air quality modelling shows that during construction, there is no anticipated change in air quality of the Nene Washes SAC due to the SAC being 16.3km downstream of the proposed site and therefore any effluents would be considerably diluted at the confluence point. In addition, the City of Peterborough lies between the Proposed Scheme and the SAC. Therefore, no likely significant effects are predicted upon the SAC or its qualifying features.</p> <p>Operation: Ongoing emissions from vehicles usage of the road (no increase in vehicle emissions concluded from air quality modelling). At operation, there is no anticipated change in air quality at the Nene Washes SAC.</p> <p>Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be <u>no likely significant effects</u> <del>no LSE</del> upon the Nene Washes SAC site during construction.</p> <p>During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be <u>no likely significant effects</u> <del>no likely significant effects</del> upon the Nene Washes SAC, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.</p>
<ul style="list-style-type: none"><li>Excavation requirements (e.g. impacts of local hydrogeology)</li></ul>	<p>All excavations are located in the vicinity of the new and existing roads. Excavations will not be deep enough to impact local hydrogeology.</p> <p>All excavated material will be stored in a safe location to prevent rainwater leaching silts into the waterbodies as legally required under current Water Framework Directive legislation.</p>
<ul style="list-style-type: none"><li>Transportation requirements</li></ul>	Machinery will be transported to and from the site, this will be standard construction equipment of excavators, trucks etc.
<ul style="list-style-type: none"><li>Duration of construction, operation, etc.</li></ul>	The proposed works programme is due to begin in March 2023 and is expected to last 18 months.
<ul style="list-style-type: none"><li>Other.</li></ul>	N/A
<b>Description of avoidance and/or mitigation measures</b> <i>Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:</i>	
<ul style="list-style-type: none"><li>Nature of proposals</li></ul>	No mitigation measures included.
<ul style="list-style-type: none"><li>Location</li></ul>	
<ul style="list-style-type: none"><li>Evidence for effectiveness</li></ul>	
<ul style="list-style-type: none"><li>Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)</li></ul>	
<b>Characteristics of European Site(s)</b> A brief description of the European Site should be produced, including information on:	



<b>Name of European Site and its EU code</b>	Nene Washes – Special Areas of Conservation (Ref No. UK0030222)
<b>Location and distance of the European Site from the proposed works</b>	Nene Washes SAC - <del>adjacent to</del> <u>Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species</u> <del>the proposed works</del>
<b>European Site size</b>	Nene Washes SAC – 82.57ha
<b>Key features of the European Site including the primary reasons for selection and any other qualifying interests</b>	Nene Washes SAC - Annex II species (spined loach <del>Cobitis taenia</del> )
<b>Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways</b>	<p>The vulnerabilities of spined loach within the SAC are listed below.</p> <ul style="list-style-type: none"> <li>• Juvenile densities</li> <li>• Population abundance</li> <li>• Distribution of supporting habitats</li> <li>• Extent of supporting habitats</li> <li>• Biological connectivity</li> <li>• Flow regime</li> <li>• Integrity of off-site habitats</li> <li>• Invasive non-native species</li> <li>• Riparian zone</li> <li>• Screening of intake and discharge</li> <li>• Sediment regime</li> <li>• Fisheries – Introduction of fish species</li> <li>• Cover of submerged macrophytes</li> <li>• Adaptation and resilience</li> <li>• Air quality</li> <li>• Conservation measures</li> <li>• Water quality and quantity.</li> </ul> <p>Within the scope of the proposed works we have scoped out all the vulnerabilities except “<del>Water Quality/Quantity</del>” and “<del>Air Quality</del>”.</p>
<b>European Site conservation objectives – where these are readily available</b>	<p>The conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the favourable conservation status of its qualifying features, by maintaining or restoring:</p> <ul style="list-style-type: none"> <li>• the extent and distribution of qualifying natural habitats and habitats of qualifying species.</li> <li>• the structure and function (including typical species) of qualifying natural habitats.</li> <li>• the structure and function of the habitats of qualifying species.</li> <li>• the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely.</li> <li>• the populations of qualifying species.</li> <li>• the distribution of qualifying species within the site.</li> </ul>
<b>Assessment criteria</b> Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.	



<p><u>Water Quality/Quantity</u></p> <p>Although not cited by Natural England as a factor affecting water quality, it is considered that pollution through spillages may have a negative effect on the water quality thus impacting the designated sites.</p> <p>The machinery used during the works require fuel and chemicals to perform the tasks and this may lead to accidental spillages. In addition, vibration may be caused through construction activities and the ground vibration may cause an effect on the sediment within the water reducing the overall water quality.</p> <p><u>Vibration</u></p> <p>Effect from vibration through the ground may results in increase in sedimentation and a reduction in habitat quality for the spined loach which is a feature of the SAC features.</p> <p><u>In-combination effects</u></p> <p>There were no predicted in-combination effects with other schemes Chapter 15 (Cumulative Effects Assessment) (TR010039/APP/6.1).</p> <p>None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes SAC.</p>	
<p><b>Initial assessment</b></p> <p>The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:</p>	
<p><b>Reduction of habitat area</b></p>	<p>There is to be no reduction in habitat area within the SAC boundary.</p>
<p><b>Disturbance to key species</b></p>	<p><b>Water Pollution</b> – There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.</p> <p>During construction, standard construction best practice methods for pollution prevention and water management will be implemented as part of the Environmental Management Plan (EMP (TR010039/APP/7.5)). Guidance on best practice in relation to pollution prevention and water management is set out in CIRIA guidelines (Charles and Edward, 2015; Gaba <i>et al.</i> 2017; Murnane <i>et al.</i>, 2006) and the Environment Agency's approach to groundwater protection (Environment Agency, 2017a) and groundwater protection guides (Environment Agency, 2017b). Monitoring of local non-designated watercourses, drainage ditches, and groundwaters at risk from pollution will be carried out prior to and during the construction phase. In addition, a temporary surface water drainage strategy shall be incorporated into the EMP (TR010039/APP/7.5). This is to prevent increased flood risk to people and property elsewhere, and to manage pollution risks most commonly associated with increased sediment loading.</p> <p>There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, it is likely that consent from the Local Lead Flood Authority and Internal Drainage Board. will be required.</p> <p>During operation, it is intended that the Proposed Scheme would utilise the existing drainage network where applicable. On the new carriageways the road drainage network would include standard design features such as filter drains carrier drains, and kerb and gullies. Drainage channels and combined kerb drains will be used where continuous drainage is required in flatter gradients. These will lead to an infiltration basin, infiltration trenches or soakaways.</p> <p>In addition, the River Nene SAC lies approximately 16.3km downstream from where the Proposed Scheme is closest to the River Nene. With best practice design and construction measures in place, and with works following the monitoring and Drainage Strategy ES Chapter 13 (Road drainage and water environment) (TR010039/APP/6.1) that will be in place, it is considered that there will be <b>no likely significant effects</b> that will occur on the SAC or the qualifying features during construction or operation. Further information is presented in Appendix B for Road Drainage and Water Environment. Spined loach were found in one location on the River Nene in 2017 and has not been found in any subsequent surveys. Therefore, it can be concluded that it is unlikely that this individual was from the population in the Nene Washes SAC. Therefore, any changes in water quality in the River Nene will have no likely significant effects upon the population</p>

	<p>or the water quality in the Nene Washes SAC, which lies 16.3km downstream of the proposed works.</p> <p><b>Noise and vibration</b> – The spawning season of spined loach is during spring (April to June). Spined loach are often nocturnal feeders and tend to rest within the sandy substrate of the watercourse during the day. Consideration on the behavioural ecology of this species has also enabled us to understand the possible effects of the proposed project on the species.</p> <p>Vibration produced from construction is not considered as a possible negative effect on spined loach within the SAC boundary as the Proposed Scheme lies 16.3km upstream of the SAC. To date no scientific studies have been undertaken on what levels of ground vibration affect spined loach (or similar fish species) therefore, our approach is to ensure the levels were as minimal as possible. As outlined in the noise and vibration assessment, impacts of vibration are likely to be restricted to the vicinity of the Proposed Scheme, although could extend along elements of the existing road network.</p> <p>Vibration modelling has been undertaken. It is anticipated that the vibration levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SAC or the qualifying features during construction or operation.</p> <p>Operational vibration was scoped out of the completed assessments in accordance with DMRB LA 111.</p> <p><b>Light disturbance</b></p> <p>Construction: Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required.</p> <p>Operation: The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SAC or the qualifying features during construction or operation.</p>
<b>Habitat or species fragmentation</b>	There is to be no habitat loss within the SAC boundary.
<b>Reduction in species density</b>	<p>There will be no in-stream works.</p> <p>Spined loach were found in two survey locations in the River Nene during the 2017 aquatic invertebrate surveys. However, they were not found in the 2018 surveys. Therefore, it is <b>unlikely</b> that the population is not significant enough to be impacted by <b>the Proposed Scheme</b>, and in turn impact the species density within the SAC.</p>
<b>Changes in key indicators of conservation value (water quality, etc)</b>	<p>Effects of possible pollution events through spillages may have a negative effect on the water quality thus impacting the designated sites. It may also reduce the integrity of off-site habitats for spined loach. The proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Refuelling will be required throughout the works at pre-designated areas. Machine servicing including maintaining oil levels (both engine and hydraulic), will also be required throughout the works and there are potential spills that can occur during this process.</p> <p>No Likely Significant Effect</p>
<b>Climate change</b>	<p>An assessment was undertaken which considered the Proposed Scheme's effect on climate (i.e. increases in carbon emissions) as well as the potential vulnerability of the Proposed Scheme to climate change.</p> <p>The construction, operation and use of the Proposed Scheme is predicted to increase carbon emissions by approximately 81,129 tonnes carbon dioxide equivalent (tCO<sub>2</sub>e) over the appraisal period of 60 years (up to 2085). As per DMRB LA 114 standards, Proposed Scheme carbon emissions have been compared with the Government's published UK carbon budgets. These budgets currently extend until 2037 and can be compared with 45% of the emissions increase associated with the Proposed Scheme. The remaining 55% of the</p>



	<p>increase in carbon emissions will occur after 2037 (the end of the last currently published UK carbon budget). Further information on the assessment of materiality can be found in Chapter 14 (Climate) (TR010039/APP/6.1).</p> <p>The vulnerability of Proposed Scheme assets to projected changes in climate during operation has been assessed, and the Proposed Scheme has been deemed resilient. Therefore, no significant effects as a result of climate change are anticipated.</p>
<b>Describe any likely impacts on the European Site as a whole in terms of:</b>	
<b>Interference with the key relationships that define the structure of the site</b>	There will be no impacts on the Nene Washes SAC through the interference with the key relationships which define the structure of the site
<b>Indicate the significance as a result of the identification of impacts set out above in terms of:</b>	
<b>Reduction of habitat area</b>	As there will be no reduction in the habitat within the SAC it has been concluded that there will be No Likely Significant Effect
<b>Disturbance to key species</b>	<p>There are in-river works on the River Nene (drainage outflows/headwalls), which are 16.3km upstream from the Nene Washes SAC where high densities of spined loach may be found. Vibration modelling has been undertaken.</p> <p>Vibration modelling has been undertaken. It is anticipated that the vibration levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SAC or the qualifying features during construction or operation as very few spined loach were found during the surveys, meaning that this population is unlikely to be from the SAC.</p>
<b>Habitat or species fragmentation</b>	No habitat or species fragmentation will occur as part of the works and therefore it has been concluded there will be no Likely Significant Effect
<b>Loss</b>	There will be no habitat loss from the proposed works and therefore it was concluded there will be <b>no likely significant effects</b> <del>No Likely Significant Effect</del>
<b>Fragmentation</b>	There will be no fragmentation across the site from the proposed works and therefore it is concluded that there will be No Likely Significant Effect
<b>Disruption</b>	No Likely Significant Effect
<b>Disturbance</b>	No Likely Significant Effect
<b>Change to key elements of the site (e.g. water quality, hydrological regime etc)</b>	<p>Construction activities for the <del>P</del>roposed <del>S</del>cheme could increase the risk of a pollution incident, associated with contaminated land or spills / leaks of chemicals. This could adversely impact on the Nene Washes SAC. However, due to the relatively short duration of the works, and the best practice approach which will be outlined within the EMP, this will ensure potential pollution issues are suitably managed.</p> <p>Operational Phase: Appropriate drainage system in place including vegetated attenuation ponds to treat run off.</p> <p>Catchpit chambers would collect any remaining sediment which has not been collected in the planted attenuation basins before it discharges into the River Nene at the headwalls.</p>
<b>Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.</b>	
<p>The impacts upon the spined loach and its habitat requirements from both noise disturbance, pollution and air quality and lighting have been assessed in detail. Evidence from both noise and air quality modelling and the surveys undertaken on site since 2017, in combination with strict DMRB stated standards on drainage and air quality assessments, have concluded that there will be <b>no likely significant effects</b><del>No Likely Significant Effect</del> on SAC features both during construction and operation.</p>	

<b>Outcome of screening stage (delete as appropriate)</b>	<b>No Likely Significant Effect</b>
<b>Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attached relevant correspondence).</b>	Natural England have been consulted regarding this Screening report and have confirmed they are satisfied with the conclusions that there will be <b>no likely significant effects</b> <del>no likely significant effects</del> upon the Nene Washes SAC as a result of the Proposed Scheme

Table A-2 Nene Washes SPA Screening Matrix

<b>Project:</b>	A47 Wansford to Sutton Dualling	
<b>European site under consideration</b>	Nene Washes SPA	
<b>Date:</b>	<b>Author (name/organisation):</b>	<b>Verified (Name/Organisation):</b>
January 2021	Ishbel Campbell, Sweco	Keith Ross, Sweco
<b>Description of project</b> Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
<b>• Size and scale (road type and probable traffic volume)</b>	<ul style="list-style-type: none"> <li>The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordinance Survey Grid Reference at the approximate centre of the <del>P</del>roposed <del>S</del>scheme is TF TL 09020 99571. This 2.5km of single carriageway forms a part of the main arterial highway route connecting Norwich with Great Yarmouth to the east.</li> <li>Works will be based surrounding A1/A47 Wansford junction and Nene Way roundabout.</li> <li>Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li> <li>Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (<b>TR010039/APP/7.3</b>).</li> <li>The Development Consent Order (DCO) boundary is provided in Appendix E. (Figure 1)</li> <li>The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO.</li> <li>Traffic volume will remain unchanged.</li> </ul>	
<b>• Land-take</b>	The Proposed Scheme boundary is provided in Appendix E (Figure 1). No land-take is required in the SPA. The Proposed Scheme land-take is currently unknown as designs are still being finalised.	
<b>• Distance from the European Site or key features of the site (from edge of the project assessment corridor)</b>	Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species.	
<b>• Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)</b>	Not applicable as no land-take from the Nene Washes SPA is required.	

<ul style="list-style-type: none"> <li>• Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)</li> </ul>	<p>Construction: Nitrogen dioxide from diesel-powered plant during construction. Proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Potential for spills during refuelling and machine servicing. Air quality modelling shows that during construction, there is no anticipated change in air quality of the Nene Washes SPA due to the SPA being 16.3km downstream of the proposed site and therefore any effluents would be considerably diluted at the confluence point. In addition, the City of Peterborough lies between the Proposed Scheme and the SPA. Therefore, no likely significant effects are predicted upon the SPA or its qualifying features. Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be <b>no likely significant effects</b> upon the Nene Washes SPA during construction.</p> <p>Operation: Ongoing emissions from vehicles usage of the road (no increase in vehicle emissions concluded from air quality modelling). At operation, there is no anticipated change in air quality at the Nene Washes SPA. During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be <b>no likely significant effects</b> upon the Nene Washes SPA, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.</p>
<ul style="list-style-type: none"> <li>• Excavation requirements (e.g. impacts of local hydrogeology)</li> </ul>	<p>All excavations are located in the vicinity of the roundabout and existing road. Excavations are not going to be deep enough to impact local hydrogeology. All excavated material will be stored in a safe location to prevent rainwater leaching silts into the waterbodies.</p>
<ul style="list-style-type: none"> <li>• Transportation requirements</li> </ul>	<p>Machinery will be transported to and from the site, this will be standard construction equipment of excavators, trucks etc..</p>
<ul style="list-style-type: none"> <li>• Duration of construction, operation, etc.</li> </ul>	<p>The proposed works programme is due to begin in March 2023 and is expected to last 18 months.</p>
<ul style="list-style-type: none"> <li>• Other.</li> </ul>	<p>N/A</p>
<b>Description of avoidance and/or mitigation measures</b> <i>Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:</i>	
<ul style="list-style-type: none"> <li>• Nature of proposals</li> <li>• Location</li> <li>• Evidence for effectiveness</li> <li>• Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)</li> </ul>	<p>No mitigation measures included.</p>
<b>Characteristics of European Site(s)</b> A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	Nene Washes – Special Protection Area (Ref No. UK9008031)
Location and distance of the European Site from the proposed works	Nene Washes SPA – Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species.
European Site size	Nene Washes SPA – 1519.85ha
Key features of the European Site including the primary reasons for	Nene Washes SPA – Breeding and Non-breeding bird species (refer to Section 3.3 and Table 3-1).



selection and any other qualifying interests																																			
<b>Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways</b>	<p>The vulnerabilities of each feature cited within the SPA are listed below. Full detailed descriptions can be found in Appendix D</p> <table border="1"> <thead> <tr> <th>Vulnerabilities &amp; Conservation Objectives</th><th>Species Affected (BTO Code<sup>8</sup>)</th></tr> </thead> <tbody> <tr> <td>Population abundance</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Extent and distribution of supporting non-breeding habitat</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Air quality</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Connectivity with supporting habitats</td><td>BS, WN, T, PT, SV,</td></tr> <tr> <td>Conservation measures</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Food availability within supporting habitat</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Hydrology/flow</td><td>BS, GA, GY, SV, BW,</td></tr> <tr> <td>Water area</td><td>BS</td></tr> <tr> <td>Water quality/quantity</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Minimising disturbance caused by human activity</td><td>BS, WN, GA, T, PT, GY, SV, BW,</td></tr> <tr> <td>Landscape</td><td>BS, WN, BW,</td></tr> <tr> <td>Vegetation characteristics</td><td>BS, WN, GA, GY, SV, BW,</td></tr> <tr> <td>Water depth</td><td>GA, T, PT, GY, SV,</td></tr> <tr> <td>Predation</td><td>GA, GY, SV, BW,</td></tr> <tr> <td>Grazing animals</td><td>BW</td></tr> <tr> <td>Landform</td><td>BW</td></tr> </tbody> </table> <p>Within the scope of the proposed works we have scoped out all the vulnerabilities except “<i>Minimising disturbance caused by human activity</i>”, “<i>Air quality</i>” and “<i>Water Quality/Quantity</i>”.</p>	Vulnerabilities & Conservation Objectives	Species Affected (BTO Code <sup>8</sup> )	Population abundance	BS, WN, GA, T, PT, GY, SV, BW,	Extent and distribution of supporting non-breeding habitat	BS, WN, GA, T, PT, GY, SV, BW,	Air quality	BS, WN, GA, T, PT, GY, SV, BW,	Connectivity with supporting habitats	BS, WN, T, PT, SV,	Conservation measures	BS, WN, GA, T, PT, GY, SV, BW,	Food availability within supporting habitat	BS, WN, GA, T, PT, GY, SV, BW,	Hydrology/flow	BS, GA, GY, SV, BW,	Water area	BS	Water quality/quantity	BS, WN, GA, T, PT, GY, SV, BW,	Minimising disturbance caused by human activity	BS, WN, GA, T, PT, GY, SV, BW,	Landscape	BS, WN, BW,	Vegetation characteristics	BS, WN, GA, GY, SV, BW,	Water depth	GA, T, PT, GY, SV,	Predation	GA, GY, SV, BW,	Grazing animals	BW	Landform	BW
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Grazing animals	BW																																		
Landform	BW																																		
<b>European Site conservation objectives – where these are readily available</b>	<p>The overarching conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:</p> <ul style="list-style-type: none"> <li>• The extent and distribution of the habitats of qualifying species</li> <li>• The structure and function of the habitats of qualifying species</li> <li>• The supporting processes on which the habitats of qualifying species rely</li> <li>• The populations of qualifying species</li> <li>• The distribution of qualifying species within the site.</li> </ul>																																		
<b>Assessment criteria</b> Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.																																			

<sup>8</sup> Bewick's Swan (BS), Wigeon (WN), Gadwall (GA), Teal (T), Pintail (PT), Garganey (GY), Shoveler (SV), Black-tailed Godwit (BW)



#### Minimising disturbance caused by human activity

Effects such as noise and visual disturbance ~~have been highlighted as having an effect on the SPA features. The works will create noise during the construction activities and potential for increased noise during operation. Lighting disturbance has also been included in this assessment are not anticipated as a result of the Proposed Scheme given the distance between the Proposed Scheme and the SPA.~~

#### Water Quality/Quantity

Although not cited by Natural England as a factor affecting water quality, it is considered that pollution through spillages may have a negative effect on the water quality thus impacting the designated sites.

The machinery used during the works require fuel and chemicals to perform the tasks and this may lead to accidental spillages.

#### Air Quality

Effects from increases in air pollution due to increased traffic volume and/or traffic flow during operation may have an impact on SPA features.

#### In-combination effects

There were no predicted in-combination effects with other schemes Chapter 15 (Cumulative Effects Assessment) (TR010039/APP/6.1).

None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes SPA.

#### **Initial assessment**

The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:

#### **Reduction of habitat area**

There is to be no reduction in habitat area within the SPA boundary.

Vegetation clearance will be required for construction however this is restricted to within 15m of the existing road and the Proposed Scheme boundary. Much of the vegetation being removed is scrub and small trees which are not within known habitat requirements for any SPA designated birds. The vegetation clearance does not link in any form with the SPA. This will be updated when more information is available.

#### **Disturbance to key species**

**Water Pollution** – There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.

During construction, standard construction best practice methods for pollution prevention and water management will be implemented as part of the Environmental Management Plan (EMP (TR010039/APP/7.5)). Guidance on best practice in relation to pollution prevention and water management is set out in CIRIA guidelines (Charles and Edward, 2015; Gaba *et al.* 2017; Murnane *et al.*, 2006) and the Environment Agency's approach to groundwater protection (Environment Agency, 2017a) and groundwater protection guides (Environment Agency, 2017b). Monitoring of local non-designated watercourses, drainage ditches, and groundwaters at risk from pollution will be carried out prior to and during the construction phase. In addition, a temporary surface water drainage strategy shall be incorporated into the EMP (TR010039/APP/7.5). This is to prevent increased flood risk to people and property elsewhere, and to manage pollution risks most commonly associated with increased sediment loading.

There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. It is likely that consent from the Local Lead Flood Authority and Internal Drainage Board. may be required.

During operation, it is intended that the Proposed Scheme would utilise the existing drainage network where applicable. On the new carriageways the road drainage network would include standard design features such as filter drains carrier drains, and kerb and gullies. Drainage channels and combined kerb drains will be used where continuous drainage is required in flatter gradients. These will lead to an infiltration basin, infiltration trenches or soakaways.

In addition, the River Nene SPA site lies approximately 16.3km downstream of the Proposed Scheme. With best practice design and construction measures in place, and with works following the monitoring and Drainage Strategy (ES Chapter 13 (Road drainage and water environment) (TR010039/APP/6.1)) that will be in place, it is considered that there will be **no likely significant effects** that will occur on the SPA or the qualifying features during construction or operation.

#### **Light disturbance**

Construction: Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required.

**Operation:** Operation: The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the SPA or the qualifying features during construction or operation.

**Air Quality:** Air quality modelling has been undertaken. It is anticipated that the change in air quality within the SPA would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the SPA or the qualifying features during construction or operation as the site lies 10km (terrestrial species) to the east of the site, with the city of Peterborough between the Proposed Scheme and the SPA. It is anticipated that there will be no likely significant effects upon the SPA. Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be **no likely significant effects** ~~no LSE~~ upon the Nene Washes SPA during construction.

During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be no likely significant effects upon the Nene Washes SPA, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.

**Noise disturbance:** Noise modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the Ramsar or the qualifying features during construction or operation as the site lies 10km (terrestrial species) to the east of the site, with the city of Peterborough between the Proposed Scheme and the SPA. It is anticipated that there will be no likely significant effects upon the SPA site.

Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be **no likely significant effects** ~~no LSE~~ upon the Nene Washes SPA as a result of construction traffic or construction noise and vibration.

Designated features from the Nene Washes recorded within the study area include, gadwall and teal. Neither of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be **no likely significant effects** ~~no LSE~~ upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.

**Visual disturbance:** The proposed works will be 10km from the SPA (terrestrial species), with the city of Peterborough between the Proposed Scheme and the SPA. In addition no large populations of any qualifying species were recorded on site and therefore no additional impact is expected. It is anticipated that there will be no likely significant effects **in respect of visual disturbance** upon the SPA.

<b>Habitat or species fragmentation</b>	<p>There is to be no habitat loss within the SPA boundary.</p> <p>Vegetation clearance will be minimal, limited only to only within the Proposed Scheme boundary. There will be no large-scale vegetation clearance which will result in no habitat or species fragmentation.</p>
<b>Reduction in species density</b>	<p>Overwintering bird surveys were undertaken once a month, for 6 months between October 2017 and March 2018. The surveys recorded two species of which are Nene Washes SPA qualifying species, teal and gadwall.</p> <p>In addition, Gadwall were recorded on two separate occasions in January 2020 (with two and four individuals) and on occasion in February 2020 (with two individuals), and two individuals of teal were recorded in January 2020.</p> <p>The breeding bird surveys were undertaken between April and June 2018, each lasting 2 days. Only one of the species recorded during the breeding bird surveys is a SPA qualifying species: teal. In addition, breeding bird surveys were carried out in March to June (inclusive) 2020. One SPA qualifying species, gadwall (found in pairs on three occasions) was recorded.</p> <p>There have been high levels of activity for a variety of species near to Wittering Brook and River Nene watercourses and their associated riparian habitat, highlighting the importance of these corridors. Agricultural areas on the north eastern section of the study area showed relatively low levels of bird activity, with few numbers of species present. However, none of these species were found in high enough numbers to be considered part of the population within the SPA as this suggests that the SPA populations are not using the Proposed Scheme boundary as preferred foraging grounds outside of the SPA. <u>The air quality and noise assessments concluded no likely significant effects <del>no likely significant effects</del> on the SPA.</u></p>



	It is considered that there will be no likely significant effects upon the SPA features due to the proposed works. <del>However, this will be updated upon receipts of the noise and air quality assessments.</del>
<b>Changes in key indicators of conservation value (water quality, etc)</b>	<p>Effects of possible pollution events through spillages and over land run-off from chemicals may have a negative effect on the water quality thus impacting the designated sites. During construction the proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Refuelling will be required throughout the works at pre-designated areas. Machine servicing including maintaining oil levels (both engine and hydraulic), will also be required throughout the works and there are potential spills that can occur during this process.</p> <p>All drainage systems throughout the construction and operation phase will be installed to DMRB standards (CG 501), therefore, it can be concluded that drainage across the Proposed Scheme will be improved from the existing system which will ensure that risk of pollution events will be minimal and therefore no impacts are anticipated.</p> <p>An air quality assessment have been undertaken. Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be <b>no likely significant effects</b> <del>no LSE</del> upon the Nene Washes SPA during construction.</p> <p>During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be <b>no likely significant effects</b> <del>no likely significant effects</del> upon the Nene Washes SPA, during operation as these sites are 10km from the proposed works, and 16.3km downstream from the proposed works via the River Nene</p>
<b>Climate change</b>	<p>An assessment was undertaken which considered the Proposed Scheme's effect on climate (i.e. increases in carbon emissions) as well as the potential vulnerability of the Proposed Scheme to climate change.</p> <p>The construction, operation and use of the Proposed Scheme is predicted to increase carbon emissions by approximately 81,129 tonnes carbon dioxide equivalent (tCO<sub>2</sub>e) over the appraisal period of 60 years (up to 2085). As per DMRB LA 114, Proposed Scheme carbon emissions have been compared with the Government's published UK carbon budgets. These budgets currently extend until 2037 and can be compared with 45% of the emissions increase associated with the Proposed Scheme. The remaining 55% of the increase in carbon emissions will occur after 2037 (the end of the last currently published UK carbon budget). Further information on the assessment of materiality can be found in Chapter 14 (Climate) (TR010039/APP/6.1).</p> <p>The vulnerability of Proposed Scheme assets to projected changes in climate during operation has been assessed, and the Proposed Scheme has been deemed resilient. Therefore, no significant effects as a result of climate change are anticipated.</p>
<b>Describe any likely impacts on the European Site as a whole in terms of:</b>	
<b>Interference with the key relationships that define the structure of the site</b>	It is predicted that there will be no impacts on the Nene Washes SPA through the interference with the key relationships which define the structure of the site. But this will be updated when more information has been provided.
<b>Indicate the significance as a result of the identification of impacts set out above in terms of:</b>	
<b>Reduction of habitat area</b>	As there will be no reduction in the habitat within the SPA it has been concluded that there will be No Likely Significant Effect
<b>Disturbance to key species</b>	<p>Noise and air quality modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose <b>no likely significant effects</b> on the SPA or the qualifying features during construction or operation as only two SPA qualified species, in small numbers a were found during the surveys, meaning that this population is unlikely to be from the SPA.</p> <p>Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be no LSE upon the Nene Washes SPA as a result of construction traffic or construction noise and vibration.</p>

	Designated features from the Nene Washes recorded within the study area include spined loach, gadwall, teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be <b>no likely significant effects</b> <del>no LSE</del> upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.
<b>Habitat or species fragmentation</b>	No habitat or species fragmentation will occur as part of the works and therefore it has been concluded there will be <b>no likely significant effects</b> <del>no Likely Significant Effect</del>
<b>Loss</b>	There will be no habitat loss from the proposed works and therefore it was concluded there will be <b>no likely significant effects</b> <del>No Likely Significant Effect</del>
<b>Fragmentation</b>	There will be no fragmentation across the site from the proposed works and therefore it is concluded that there will be <b>no likely significant effects</b> <del>No Likely Significant Effect</del>
<b>Disruption</b>	<b>no likely significant effects</b> <del>No Likely Significant Effect</del>
<b>Disturbance</b>	<b>no likely significant effects</b> <del>No Likely Significant Effect</del>
<b>Change to key elements of the site (e.g. water quality, hydrological regime etc)</b>	Construction activities for the proposed scheme could increase the risk of a pollution incident, associated with contaminated land or spills / leaks of chemicals. This could adversely impact on the Nene Washes Ramsar. However, due to the relatively short duration of the works, and the best practice approach which will be outlined within the EMP, this will ensure potential pollution issues are suitable managed.  Run-off from road through surface drains will be improved during construction to remove existing direct outfalls to the River Nene present on the bridge deck. Therefore, no impacts are anticipated. It can therefore be concluded that there will be <b>no likely significant effects</b> <del>no Likely Significant Effect</del> from pollution as part of the proposed works.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	
<del>The impacts from air quality and drainage have been assessed in detail and have concluded that there will be No Likely Significant Effect on SPA features both during construction and operation. Evidence from both noise modelling and the wintering and breeding bird surveys undertaken on site since 2017 in combination with strict DMRB stated standards on drainage and air quality assessments have concluded that there will <u>will</u> be No Likely Significant Effect on SPA features both during construction and operation.</del>	
<b>Outcome of screening stage (delete as appropriate).</b>	<b>No Likely Significant Effect</b>
<b>Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attached relevant correspondence).</b>	Natural England have been consulted regarding this Screening report and have confirmed they are satisfied with the conclusions that there will be no likely significant effects upon the Nene Washes SAC as a result of the Proposed Scheme.

Table A-34 Nene Washes Ramsar Screening Matrix

<b>Project Name:</b>	A47 Wansford to Sutton Dualling	
<b>European site under consideration</b>	Nene Washes Ramsar	
<b>Date:</b>	<b>Author (Name/Organisation):</b>	<b>Verified (Name/Organisation):</b>
January 2021	Ishbel Campbell	Keith Ross

<b>Description of project</b> <b>Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:</b>	
<b>• Size and scale (road type and probable traffic volume)</b>	<ul style="list-style-type: none"> <li>The proposed works are located between A1/A47 Wansford junction and Nene Way roundabout, Cambridgeshire. The Ordinance Survey Grid Reference at the approximate centre of the <del>P</del>roposed <del>S</del>cheme is TF TL 09020 99571. This 2.5km of single carriageway forms a part of the main arterial highway route connecting Norwich with Great Yarmouth to the east.</li> <li>Works will be based surrounding A1/A47 Wansford junction and Nene Way roundabout.</li> <li>Whilst around half of the A47 is already dual carriageway, the Wansford to Sutton section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users.</li> <li>Traffic volume is anticipated to increase over the lifespan of the road. This is considered in detail in the Transport Assessment (TR010039/APP/7.3).</li> <li>The Development Consent Order (DCO) boundary is provided in Appendix E (Figure 1).</li> <li>The Proposed Scheme is categorised as a Nationally Significant Infrastructure Project and therefore requires DCO.</li> <li>Traffic volume will remain unchanged.</li> </ul>
<b>• Land-take</b>	<p>The Proposed Scheme boundary is provided in Appendix E (Figure 1).</p> <p>No land-take is required in the Ramsar.</p> <p>The Proposed Scheme land-take is currently unknown as designs are still being finalised.</p>
<b>• Distance from the European Site or key features of the site (from edge of the project assessment corridor)</b>	<p>Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species.</p>
<b>• Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)</b>	<p>Not applicable as no land-take from the Nene Washes Ramsar is required.</p>
<b>• Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)</b>	<p>Construction: Nitrogen dioxide from diesel-powered plant during construction. Proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Potential for spills during refuelling and machine servicing. Air quality modelling shows that during construction, there is no anticipated change in air quality of the Nene Washes Ramsar due to the Ramsar site being 16.3km downstream of the proposed site and therefore any effluents would be considerably diluted at the confluence point. In addition, the City of Peterborough lies between the Proposed Scheme and the Ramsar site. Therefore, <del>no likely significant effects</del> <u>no likely significant effects</u> are predicted upon the Ramsar site or its qualifying features.</p> <p>Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be <u>no likely significant effects</u> <del>no LSE</del> upon the Nene Washes Ramsar as a result of construction traffic or construction noise and vibration.</p> <p>Designated features from the Nene Washes recorded within the study area include teal and golden plover. Neither of these species occurred</p>



	<p>frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be <u>no likely significant effects</u> <del>no LSE</del> upon the features of the Nene Washes Ramsar site as a result of construction traffic or construction noise and vibration or from operational noise.</p> <p>Operation: Ongoing emissions from vehicles usage of the road (no increase in vehicle emissions concluded from air quality modelling). At operation, there is no anticipated change in air quality at the Nene Washes Ramsar site.</p>
• Excavation requirements (e.g. impacts of local hydrogeology)	<p>All excavations are located in the vicinity of the roundabout and existing road. Excavations are not going to be deep enough to impact local hydrogeology.</p> <p>All excavated material will be stored in a safe location to prevent rainwater leaching silts into the waterbodies.</p>
• Transportation requirements	Machinery will be transported to and from the site, this will be standard construction equipment of excavators, trucks etc.
• Duration of construction, operation, etc.	The proposed works programme is due to begin in March 2023 and is expected to last 18 months.
• Other.	N/A
<b>Description of avoidance and/or mitigation measures</b> Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:	
• Nature of proposals	No mitigation measures included.
• Location	
• Evidence for effectiveness	
• Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	
<b>Characteristics of European Site(s)</b> A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	Nene Washes – Ramsar
Location and distance of the European Site from the proposed works	Nene Washes Ramsar – Approximately 10km to the proposed works for terrestrial species and 16.3km for aquatic species.
European Site size	Nene Washes Ramsar – 1519.66ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	<p>Bewick's swan Possible future designation – Northern pintail Possible future designation – Black-tailed godwit Whooper swan Eurasian wigeon Pochard Eurasian teal Golden plover Ruff <u>Nationally rare breeding birds<sup>9</sup></u></p>

<sup>9</sup> [The rare breeding birds used a justification for RAMSAR criterion 2 are not detailed within the Information Sheet](#)

	<p><u>Nationally rare plants<sup>10</sup></u></p> <p><u>Two vulnerable and two rare invertebrate species<sup>11</sup></u></p>
<b>Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways</b>	Nene Washes Ramsar – There are no outlined vulnerabilities or conservation objectives outlined within the most updated Nene Washes Ramsar Information Sheet (RIS). The most up to date document for this site is 5 March 1993.
<b>European Site conservation objectives – where these are readily available</b>	<p>The overarching conservation objectives for the site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to the Birds and Habitats Directives by achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:</p> <ul style="list-style-type: none"> <li>• The extent and distribution of the habitats of qualifying species</li> <li>• The structure and function of the habitats of qualifying species</li> <li>• The supporting processes on which the habitats of qualifying species rely</li> <li>• The populations of qualifying species</li> <li>• The distribution of qualifying species within the site</li> </ul>
<p><b>Assessment criteria</b></p> <p><b>Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.</b></p>	
<p><del>Minimising disturbance caused by human activity</del></p> <p><del>Effects such as noise and visual disturbance have been highlighted as having an effect on the Ramsar features. The works will create noise during the construction activities and potential for increased noise during operation. Lighting disturbance has also been included in this assessment.</del></p> <p><u>Water Quality/Quantity</u></p> <p>Although not cited by Natural England as a factor affecting water quality, it is considered that pollution through spillages may have a negative effect on the water quality thus impacting the designated sites.</p> <p>The machinery used during the works require fuel and chemicals to perform the tasks and this may lead to accidental spillages.</p> <p><u>Air Quality</u></p> <p>Effects from increases in air pollution due to increased traffic volume and/or traffic flow during operation may have an impact on Ramsar features.</p> <p><u>In-combination effects</u></p> <p>There were no predicted in-combination effects with other schemes Chapter 15 (Cumulative Effects Assessment) (TR010039/APP/6.1).</p> <p>None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes Ramsar.</p>	
<p><b>Initial assessment</b></p> <p><b>The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:</b></p>	
<b>Reduction of habitat area</b>	There will be no reduction in habitat area from the proposed works.
<b>Disturbance to key species</b>	

<sup>10</sup> The nationally rare plant species recorded on site are *Nymphoides peltata*, *Potamogeton trichoides*, *Rumex palustris*, *Potamogeton friesii*, *Alisma lanceolatum* and *Hordeum marinum*.

<sup>11</sup> The vulnerable and rare invertebrates recorded on site are *Valvata macrostoma*, *Agabus undulatus*, *Libellula fulva* and *Anasimyia interpuncta*

**Water Pollution** – There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. In addition, consent from the Local Lead Flood Authority and Internal Drainage Board may be required.

During construction, standard construction best practice methods for pollution prevention and water management will be implemented as part of the Environmental Management Plan (EMP (TR010039/APP/7.5)). Guidance on best practice in relation to pollution prevention and water management is set out in CIRIA guidelines (Charles and Edward, 2015; Gaba *et al.* 2017; Murnane *et al.*, 2006) and the Environment Agency's approach to groundwater protection (Environment Agency, 2017a) and groundwater protection guides (Environment Agency, 2017b). Monitoring of local non-designated watercourses, drainage ditches, and groundwaters at risk from pollution will be carried out prior to and during the construction phase. In addition, a temporary surface water drainage strategy shall be incorporated into the EMP (TR010039/APP/7.5). This is to prevent increased flood risk to people and property elsewhere, and to manage pollution risks most commonly associated with increased sediment loading.

There are construction activities planned within the River Nene and its floodplain. As such, consent (in the form of a Flood Risk Activity Permit) will be required from the Environment Agency. It is likely that consent from the Local Lead Flood Authority and Internal Drainage Board. may be required.

During operation, it is intended that the Proposed Scheme would utilise the existing drainage network where applicable. On the new carriageways the road drainage network would include standard design features such as filter drains carrier drains, and kerb and gullies. Drainage channels and combined kerb drains will be used where continuous drainage is required in flatter gradients. These will lead to an infiltration basin, infiltration trenches or soakaways.

In addition, the River Nene Ramsar site lies approximately 10km east of the Proposed Scheme. With best practice design and construction measures in place, and with works following the monitoring and Drainage Strategy (ES Chapter 13 (Road drainage and water environment) (TR010039/APP/6.1) that will be in place, it is considered that there will be **no likely significant effects** that will occur on the Ramsar site or the qualifying features during construction or operation. Only two bird species which are designated features of the Nene Washes Ramsar site were found in the wintering and breeding bird surveys over the study area. In addition, these species were found in such small numbers that it is highly unlikely that these individuals are part of the populations within the Ramsar site. Therefore, it can be concluded that there will be **no likely significant effects** upon the populations within the Nene Washes Ramsar site.

#### Light disturbance

**Construction:** Construction will predominately take place during daytime, minimising the need for further lighting requirements. Night-time working would be undertaken only when required.

**Operation:** The current lighting design proposes 10m height lighting columns with LED luminaires, located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero-degree tilt and a minimum as installed luminous intensity of G4, to ensure glare and upward light spill is minimised. In addition, lightening has been kept to a minimum by locating columns at the junctions only. Therefore, it is anticipated that the lighting levels would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the Ramsar or the qualifying features during construction or operation.

**Air Quality:** Air quality modelling has been undertaken. Air quality modelling is has been undertaken. It is anticipated that the change in air quality within the Ramsar site would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the Ramsar or the qualifying features during construction or operation as the site lies 16.3km downstream (aquatic species) and 10km (terrestrial species) to the east of the site, with the city of Peterborough between the Proposed Scheme and the Ramsar site.

Construction is due to occur over the course of 18 months. The threshold for including this in an air quality assessment is 24 months. Therefore it is predicted that there will be no LSE upon the Nene Washes Ramsar site during construction.

During operation it has been concluded that, because the receptors identified in Appendix B in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be no likely significant effects upon the Nene Washes Ramsar site, during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.

**Noise disturbance:** Noise modelling has been undertaken. Noise modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose **no likely significant effects** on the Ramsar or the qualifying features during construction or operation as the site lies 16.3km downstream and 10km to the east of the site, with the city of Peterborough between the Proposed Scheme and the Ramsar site.

Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be no LSE upon the Nene Washes Ramsar site as a result of construction traffic or construction noise and vibration.

Designated features from the Nene Washes Ramsar site recorded within the study area include teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be **no likely significant effects** ~~no LSE~~ upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration or from operational noise.

**Visual disturbance:** The proposed works will be 10km from the Ramsar site (terrestrial species), with the city of Peterborough between the Proposed Scheme and the Ramsar site. In addition no large populations of any qualifying species were recorded on site and therefore no additional impact is expected. It is anticipated that there will be no likely significant effects upon the Ramsar site.



<b>Habitat or species fragmentation</b>	<p>There is to be no habitat loss within the Ramsar boundary. Vegetation clearance will be minimal, limited only to only within the Proposed Scheme boundary. There will be no large-scale vegetation clearance which will result in no habitat or species fragmentation.</p>
<b>Reduction in species density</b>	<p>Overwintering bird surveys were undertaken once a month, for 6 months between October 2017 and March 2018. The surveys recorded two species of which are Nene Washes Ramsar qualifying species, teal and golden plover.</p> <p>In addition, and two individuals of teal were recorded in January 2020. A larger group of 30 golden plover, were recorded <del>on</del> in January 2020.</p> <p>The breeding bird surveys were undertaken between April and June 2018, each lasting 2 days. Only one of the species recorded during the breeding bird surveys is a Ramsar qualifying species: teal. In addition, breeding bird surveys were carried out in March to June (inclusive) 2020. Golden plover (was found as a large flock of 80 individuals).</p> <p>There have been high levels of activity for a variety of species near to Wittering Brook and River Nene watercourses and their associated riparian habitat, highlighting the importance of these corridors. Agricultural areas on the north eastern section of the study area showed relatively low levels of bird activity, with few numbers of species present. However, none of these species were found in high enough numbers to be considered part of the population within the Ramsar as this suggests that the Ramsar populations are not using the Proposed Scheme boundary as preferred foraging grounds outside of the Ramsar site. <a href="#">The air quality and noise assessments concluded no likely significant effects on the SPA.</a></p> <p>It is considered that there will be no likely significant effects upon the Ramsar features due to the proposed works. <del>However, this will be updated upon receipts of the noise and air quality assessments.</del></p> <p><a href="#">The breeding bird, plant and invertebrate species listed under criterion 2 will not be impacted by the Proposed Scheme due to the distance involved between the scheme and the RAMSAR site.</a></p>
<b>Changes in key indicators of conservation value (water quality, etc)</b>	<p>Effects of possible pollution events through spillages and over land run-off from chemicals may have a negative effect on the water quality thus impacting the designated sites. During construction the proposed works machinery will be diesel / petrol powered, and on-site generators will also be required. Refuelling will be required throughout the works at pre-designated areas. Machine servicing including maintaining oil levels (both engine and hydraulic), will also be required throughout the works and there are potential spills that can occur during this process.</p> <p>All drainage systems throughout the construction and operation phase will be installed to DMRB standards (CG 501), therefore, it can be concluded that drainage across the Proposed Scheme will be improved from the existing system which will ensure that risk of pollution events will be minimal and therefore no impacts are anticipated.</p>
<b>Climate change</b>	<p>An assessment was undertaken which considered the Proposed Scheme's effect on climate (i.e. increases in carbon emissions) as well as the potential vulnerability of the Proposed Scheme to climate change.</p> <p>The construction, operation and use of the Proposed Scheme is predicted to increase carbon emissions by approximately 81,129 tonnes carbon dioxide equivalent (tCO<sub>2</sub>e) over the appraisal period of 60 years (up to 2085). As per DMRB LA 114, Proposed Scheme carbon emissions have been compared with the Government's published UK carbon budgets. These budgets currently extend until 2037 and can be compared with 45% of the emissions increase associated with the Proposed Scheme. The remaining 55% of the increase in carbon emissions will occur after 2037 (the end of the</p>

	<p>last currently published UK carbon budget). Further information on the assessment of materiality can be found in Chapter 14 (Climate) (TR010039/APP/6.1).</p> <p>The vulnerability of Proposed Scheme assets to projected changes in climate during operation has been assessed, and the Proposed Scheme has been deemed resilient. Therefore, <u>no likely significant effects</u> <del>no significant effects</del> as a result of climate change are anticipated.</p>
<b>Describe any likely impacts on the European Site as a whole in terms of:</b>	
<b>Interference with the key relationships that define the structure of the site</b>	There will be no impacts on the Nene Washes Ramsar through the interference with the key relationships which define the structure of the site.
<b>Indicate the significance as a result of the identification of impacts set out above in terms of:</b>	
<b>Reduction of habitat area</b>	As there will be no reduction in the habitat within the Ramsar is has been concluded that there will be No Likely Significant Effect
<b>Disturbance to key species</b>	Noise and air quality modelling has been undertaken. It is anticipated that the noise levels would be negligible to minor (EIA terminology) and will pose <u>no likely significant effects</u> on the Ramsar or the qualifying features during construction or operation as only two Ramsar qualified species, in small numbers a were found during the surveys, meaning that this population is unlikely to be from the Ramsar site.
<b>Habitat or species fragmentation</b>	No habitat or species fragmentation will occur as part of the works and therefore it has been concluded there will be no Likely Significant Effect
<b>Loss</b>	There will be no habitat loss from the proposed works and therefore it was concluded there will be <u>no likely significant effects</u> <del>No Likely Significant Effect</del>
<b>Fragmentation</b>	There will be no fragmentation across the site from the proposed works and therefore it is concluded that there will be No Likely Significant Effect
<b>Disruption</b>	<u>No likely significant effects</u> <del>No Likely Significant Effect</del>
<b>Disturbance</b>	<u>No likely significant effects</u> <del>No Likely Significant Effect</del>
<b>Change to key elements of the site (e.g. water quality, hydrological regime etc)</b>	<p>Construction activities for the proposed scheme could increase the risk of a pollution incident, associated with contaminated land or spills / leaks of chemicals. This could adversely impact on the Nene Washes Ramsar. However, due to the relatively short duration of the works, and the best practice approach which will be outlined within the EMP, this will ensure potential pollution issues are suitable managed.</p> <p>Run-off from road through surface drains will be improved during construction to remove existing direct outfalls to the River Nene present on the bridge deck. Therefore, no impacts are anticipated. It can therefore be concluded that there will be <u>no likely significant effects</u> <del>no Likely Significant Effect</del> from pollution as part of the proposed works.</p>
<b>Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.</b>	
<p>Evidence from both noise and air quality modelling <del>is yet to be received</del> <u>confirms no significant effects on the site are likely</u> <del>however,</del> The wintering and breeding bird surveys undertaken on site since 2017, in combination with strict DMRB stated standards on drainage and air quality assessments have concluded that there will be <u>no likely significant effect</u> on Ramsar features both during construction and operation.</p>	



Outcome of screening stage (delete as appropriate)	No Likely Significant Effect
Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attached relevant correspondence).	Natural England have been consulted regarding this Screening report and have confirmed they are satisfied with the conclusions that there will be <del>no likely significant effect</del> <del>no likely significant effects</del> upon the Nene Washes SAC as a result of the Proposed Scheme

## Appendix B. Potential effects

### Air quality

#### Construction

As construction activities are programmed to last less than two years, it is unlikely there would be a significant effect on air quality or affect the UK's ability to comply with the Air Quality Directive. The construction traffic assessment was therefore screened out of the assessment.

With the implementation of best practice construction measures, the impact of construction dust is considered highly unlikely to trigger a significant air quality effect upon the Nene Washes SAC, SPA and Ramsar site, as they lie 10km (and 16.3km downstream of the River Nene) to the east of the Proposed Works. Therefore, in accordance with LA 105, no significant effects on sensitive receptors have been identified.

#### Operation

A nitrogen deposition assessment was conducted to assess whether there was potential for a significant impact to be predicted. The background nitrogen deposition rates (kg N/ha/yr) were sourced from the Air Pollution Information System (APIS). The APIS website was used and the competent expert for biodiversity was consulted to identify which feature of the identified designated habitats were sensitive to nitrogen deposition.

The relevant nitrogen critical load values and background information used in this assessment is presented in Table B-1.

Table B-1: Background nitrogen deposition rates and critical load values

Designated habitat	Nitrogen critical load class	Critical Load (kg N/ha/yr)	Average background nitrogen deposition rate (kg N/ha/yr)	Species sensitive to nitrogen deposition?
Thorpe Wood	Broadleaved, mixed and yew woodland	10-20	23.5	Yes
Sibson Flood Meadows	Coastal and floodplain grazing marsh	10-20	18.2	Yes
Roadside Nature Reserve	Calcareous grassland	21.3	5-10	Yes
Sutton Heath and Bog	Calcareous grassland	15-25	19.7	Yes

The modelled road NO<sub>x</sub> was converted to road NO<sub>2</sub> using the NO<sub>x</sub>-NO<sub>2</sub> calculator. The following equations, taken from paragraph 2.43 onwards in LA 105, outlines the steps taken to obtain a total receptor nitrogen deposition rate.

1a. *Conversion rate for grassland and similar habitats*

$$= 0.14 \frac{\text{kg N}}{\text{ha yr}} \text{ (obtained from LA105)}$$

1b. *Conversion rate for forests and similar habitats*

$$= 0.29 \frac{\text{kg N}}{\text{ha yr}} \text{ (obtained from LA105)}$$

$$2. \text{Road NO}_2 \times \text{conversion rate} = \text{dry nutrient (N) deposition rate} \left( \frac{\text{kg N}}{\text{ha yr}} \right)$$

$$3. \text{Dry nutrient (N) deposition rate} + \text{background nitrogen deposition rate} \\ = \text{total receptor nitrogen deposition rate}$$

The total receptor nitrogen deposition rate was compared against the critical load values of the most sensitive site feature for the designated habitat. The change in nitrogen deposition was also compared against the lower critical load value for each designated habitat. This approach is consistent with LA 105.

The comparison of the total nitrogen deposition rate to the critical load is presented in Table B-2. The first point of each modelled transect is presented as this represented the highest and worst-case concentrations.

Table B-2: Comparison of total nitrogen deposition to critical load

Transect receptor ID	Total nitrogen deposition rate (kg N/ha/yr)			DM-DS as % of lower critical load
	DM 2025	DS 2025	DM-DS	
Thorpe_Wood_AW_01	25.45	25.54	0.08	0.84%
Sibson_Flood_Meadows_01	19.43	19.41	-0.02	-0.21%
Roadside_Nature_Reserve_01	22.41	22.27	-0.14	-2.80%
1_SH_SSSI_1	20.03	20.32	0.28	1.89%

The nitrogen deposition assessment concluded the total nitrogen deposition rate with the project was above the applicable lower critical load for each designated site.

The change in nitrogen deposition with the project was less than 1% of the lower critical load for three of the four designated sites assessed. In line with the criteria outlined in Figure 2.98 in LA 105, no significant effects on these designated sites were identified.

The change in nitrogen deposition with the project at the Sutton Heath and Bog SSSI was greater than 1% of the lower critical load for the first four modelled transect points. Results for the comparison against the lower critical load values for the SSSI transect can be found in Table .

Table B-3: SSSI transect results

Transect receptor ID	Total nitrogen deposition rate (kg N/ha/yr)			DM-DS as % of lower critical load
	DM 2025	DS 2025	DM-DS	
1_SH_SSSI_1	20.03	20.32	0.28	1.89
1_SH_SSSI_2	20.01	20.23	0.22	1.47
1_SH_SSSI_3	19.98	20.16	0.18	1.20
1_SH_SSSI_4	19.96	20.11	0.15	1.00
1_SH_SSSI_5	19.95	20.08	0.13	0.85
1_SH_SSSI_6	19.94	20.05	0.11	0.74
1_SH_SSSI_7	19.92	20.02	0.10	0.64
1_SH_SSSI_8	19.91	20.00	0.09	0.58
1_SH_SSSI_9	19.90	19.98	0.08	0.51
1_SH_SSSI_10	19.90	19.97	0.07	0.47
1_SH_SSSI_11	19.89	19.95	0.06	0.43
1_SH_SSSI_12	19.88	19.94	0.06	0.39
1_SH_SSSI_13	19.88	19.93	0.06	0.37

In line with Figure 2.98 in LA105, the competent expert for biodiversity was contacted to identify whether the site air quality attribute will be restored or maintained.

The Sutton Heath and Bog SSSI supports grassland communities of two main types, namely calcareous grassland and neutral grassland of the base-poor marsh type, both of which are uncommon in Cambridgeshire. The southern extent of the site comprises semi natural broadleaved woodland. Air quality modelling highlighted an impact of nitrogen deposition 40m north of the ~~Proposed scheme~~ Scheme at Station House. The habitat within this 40m area is deciduous woodland comprising pedunculate oak (*Quercus robur*), and sycamore (*Acer pseudoplatanus*) abundant with hawthorn (*Crataegus* ~~sp~~ *monogyna*) and elder (*Sambucus nigra*) understory. None of the species listed are noted as particularly nitrogen vulnerable in this case. Nitrogen deposition would typically affect more coniferous species and species such as lichens/mosses/ferns rather than the species that are listed. As the core grassland habitat which is listed on the citation is approximately 150m further north-east of the 40m impact area, it is not considered to be impacted by nitrogen disposition from the proposed road alignment. No significant effects have therefore been identified.

It has been concluded that, because the sites identified in Tables B-1 and B-2 will not be subject to likely significant effects, there will also be no likely significant effects upon the Nene Washes SAC, SPA and Ramsar during operation as these sites are 10km from the proposed works, and 16.3km from the proposed works via the River Nene.

## Noise and vibration

### *Construction traffic, noise and vibration*

For the construction noise assessment, the study area has been defined as the area that is 300m from the closest construction activity.

For the construction vibration assessment, DMRB LA 111 notes that a study area encompassing a 100m area from vibration generating activity is normally sufficient. However, given the expected methods of work, a study area encompassing 30m area from vibration generating activity is considered appropriate for identifying potentially significant effects since beyond this distance construction vibration, would not be perceptible.

For the construction traffic assessment, DMRB LA 111 states that a study area shall be defined to include a 50m width from the kerb line of public roads with the potential for an increase in the baseline noise level of 1dB(A) or more as a result of the addition of construction traffic to existing traffic levels. As shown in ES Chapter 11 (Noise and Vibration (**TR010039/APP/6.1**)), increases in the baseline noise level due to the addition of construction related traffic are predicted to remain below 1dB(A). Therefore, a study area for the construction traffic assessment is considered unnecessary, the likelihood of significant effect is



determined through assessment of the road traffic noise increase alone, not at specific receptors or areas.

It is expected that the majority of construction works would normally take place between 07.00 – 19.00 Monday to Friday and 07.00 – 19.00 on Saturday. There may be exceptions to these hours for oversized deliveries, and junction tie-ins. Exceptions may include works taking place between 20:00hrs and 06:00hrs, as detailed in the Environmental Management Plan (**TR010039/APP/7.3**).

A construction noise assessment has been undertaken, which shows that only some of the residential receptors located within 30m to some construction activities are predicted to experience a temporary moderate or major magnitude of impact. Suitable means of reducing the significance of noise from construction have been presented including the provision of temporary acoustic barriers to reduce the impact of this noise.

The Nene Washes SAC, SPA and Ramsar site lie 10km away from the Proposed Works, and 16.3km downstream from them along the River Nene. Construction is due to occur for a duration of 18 months, and therefore, it is considered that there will be no LSE upon the Nene Washes as a result of construction traffic or construction noise and vibration.

Designated features from the Nene Washes recorded within the study area include spined loach, gadwall, teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be no LSE upon the features of the Nene Washes as a result of construction traffic or construction noise and vibration.

## Operation

The operational study area for this assessment has been defined as the area within 600 metres of new road links or road links physically changed or bypassed by the project. Road links predicted to have a short-term BNL change of more than 1.0dB(A) beyond this area are also predicted to have road traffic noise levels well below SOAEL due to the Proposed Scheme. Therefore, these additional road links have not been assessed because a minor noise change where SOAEL is not met or exceeded due to the Proposed Scheme is considered to be not significant according to DMRB LA 111

The assessment identifies that there are no dwellings where the façade noise level is at least 68 dB  $L_{A10,18h}$  and the noise from the new or altered highways causes the total level to increase by at least 1.0dB.

The Nene Washes SAC, SPA and Ramsar site lie 10km away from the Proposed Works, and 16.3km downstream from them along the River Nene. Designated features from the Nene Washes recorded within the study area include spined loach, gadwall, teal and golden plover. None of these species occurred frequently, or in great numbers which therefore suggests that these individuals are not part of the populations which rely on the Nene Washes. Therefore, it is considered that there will be no LSE upon the features of the Nene Washes as a result of operational noise.

## Road drainage and water environment Construction

During construction, best practice measures will be implemented as part of the overall Environment Management Plan (EMP). Guidance in relation to pollution prevention and water management is set out in CIRIA guidelines (C741 Charles and Edward, 2015; C648 Murnane *et al.*, 2006) and the Environment Agency's approach to groundwater protection (Environment Agency, 2017a) and groundwater protection guides (Environment Agency, 2006, 2017b).

### Surface water

The design and construction of all above ground structures should aim to minimise the potential to impact on surface water features and flood risk. Specific best practice measures will be implemented, which are described below.

The potential for impacts to occur as a result of contamination from accidental spillages must be minimised by the following elements:

- Appropriate storage of construction materials, including bunding of storage tanks, use of silt fencing and covering stockpiles.
- Spill kits should be located on sites near to ordinary watercourses and within the works compounds and staff should be trained in their use.
- Emergency response procedures included in the EMP to handle any leakages or spillages of potentially contaminating substances.

No pollution pathways should be created between the construction sites, including material lay down areas, and ordinary watercourses. Measures shall be implemented to prevent surface water runoff containing suspended sediment reaching watercourses through overland flow during rainfall events. This shall include an appropriate treatment train to prevent accidental spillages reaching groundwater, remove sediment and other contaminants as well as attenuating runoff. This must be specified as part of a temporary surface water drainage strategy within the EMP.

Mill Stream, Wittering Brook and River Nene is designated as a NVZ for surface water and for groundwater. Splash Dyke is also designated as a NVZ for surface water. Wittering Brook and the Nene – Islip to Tidal WFD water bodies are prevented from achieving good ecological potential due to the phosphate concentrations found in the catchment. Where construction activities have the potential to mobilise nitrate and phosphate during, for example, earthworks in areas of agriculture, there is a potential to increase nitrate and phosphate concentrations within the surface water features or to groundwater.

Temporary drainage from the main construction compound would typically be collected within a ditch surrounding the compound and redirected to settlement ponds before being discharged to either a surface watercourse or ground. Discharges to groundwater, surface water and / or sewer must only be made with the appropriate consents or permits in place. Any non-compliant discharges would be collected and disposed of off-site at a licensed facility.

The above required elements will satisfy the WFD physicochemical and biological water quality objectives of Wittering Brook and the Nene – Islip to Tidal water bodies caused by construction activities and spillages.

There are construction activities planned within Mill Stream, Wittering Brook, River Nene and their floodplains, ordinary watercourse and drainage ditches. This includes the construction of the proposed drainage, outfalls, Sacrewell Farm receptor site, Wittering Brook culvert and associated watercourse diversion and drainage ditch interception. Approval must be sought for an ordinary watercourse consent from Cambridgeshire and Peterborough County Council before any construction works is undertaken. There are construction activities planned within the main river (the River Nene) and its floodplain. This includes the construction of new outfalls, embankments, and the Proposed Scheme. As such, consent in the form of a Flood Risk Activity Permit would be required from the Environment Agency. Any potential increase in flood risk and negative impacts on surface water receptors shall be managed by the implementation of a construction-phase drainage system, where the construction will take place offline.

The potential impacts from the construction of the Proposed Scheme including outfalls, drainage, crossings, and associated features shall be managed through the phased construction plan. The Wittering Brook culvert, the minor watercourse diversions associated with the culvert, the outfalls into the River Nene, drainage ditch interception, Sacrewell Farm receptor site and the compensatory flood storage areas will be designed to minimise impacts on water quality as is a legal requirement. In-river sediment controls (for example, sediment booms, silt nets, straw matting) shall be used and it shall be undertaken during low flows to minimise sediment transport. Due to the

installation of the new Wittering Brook culvert it is deemed there will be minor adverse impacts on the biodiversity of Wittering Brook as a result. However, the Proposed Scheme has been designed to minimise impacts on the water environment:

- The new culvert at Wittering Brook must accommodate natural river-bed material in the base of the culvert, together with a mammal ledge above the design flood level to maintain habitat connectivity.
- The installation of new ditch and ponds at Sacrewell Farm receptor site adjacent to Mill Stream must provide suitable water depth for water voles.
- Riparian planting adjacent to Mill Stream and the minor watercourse diversion will be provided to offset any negative impacts of lost habitat.

Works would lead to temporary changes in overland flow and volume by the alterations of ground elevations due to re-profiling, pond infilling and construction of above ground structures and embankments acting as a barrier to flow. This increased flood risk and negative impacts on surface water receptors must be managed by the implementation of a construction-phase drainage. A temporary surface water drainage strategy must be developed and be incorporated into the EMP to prevent increased flood risk to people and property elsewhere, and to manage pollution risks. Drainage must be constructed in the early stages of the Proposed Scheme.

Increased flood risk and negative impacts on surface water receptors caused by an increase in impermeable area, leading to an increase in the peak flow rate, volume or change in the direction of surface water runoff, must be managed by the implementation of a temporary surface water drainage strategy. The strategy shall adopt SuDS principles to attenuate runoff to existing rates as well as provide water treatment; this must be incorporated into the EMP. This would prevent increased flood risk to people and property elsewhere and manage any impacts on aquatic environment, recreation, and value to economy.

## Operational

The Drainage strategy ES Chapter 13 (Road drainage and water environment) **TR010039/APP/6.1**) proposes the road drainage will drain to groundwater and surface water. Road drainage discharging surface water will discharge to seven locations, utilising five new outfalls, which is to be confirmed through a drainage survey. The receiving watercourses include Mill Stream, Wittering Brook, a tributary of Wittering Brook, River Nene, Splash Dyke. The location of the outfalls can be found in ES Chapter 13 (Road drainage and water environment) **(TR010039/APP/6.1)**. Prior to discharging to the watercourses, the runoff from the new outfalls must be directed through filter drains and detention basins or



wetlands. A wetland and swale have been proposed at the Oak Farm tributary outfalls to mitigate copper pollution impacts.

The potential water quality impacts of routine runoff on surface water receptors has also been assessed using DMRB LA 113 HEWRAT assessment (assessment of pollution impacts from routine runoff to surface waters), as described in ES Chapter 13 (Road drainage and water environment) (**TR010039/APP/6.1**). The assessment shows that there is a negligible impact following dilution in the channel for both soluble and sediment-bound pollutants.

The potential water quality impacts of accidental spillages on surface water bodies were assessed using HEWRAT spillage assessment, as described in Appendix D of DMRB LA 113. All outfalls passed this assessment with the results indicating all drainage areas would have <0.5% annual risk of pollution. The output from these assessments can be found in Appendix 13.3 (Water quality assessment) (**TR010039/APP/6.3**). Best practice measures for pollution control will be provided in order to reduce any pollution that may occur in the event of a spillage as described in the ES Chapter 13 (Road drainage and water environment) (**TR010039/APP/6.1**).

As the Proposed Scheme option has a footprint greater than 1ha and crosses Flood Zone 3, a Flood risk assessment has been prepared. The pattern of flood risk impacts and the best practice design measures depend on the location and the proposed works, as discussed below.

Any increase in runoff associated with the alteration of ground elevation due to the re-profiling and construction of embankments will be intercepted using appropriately designed drains along the Proposed Scheme. Further details can be found in the Flood risk assessment Appendix 13.1 (**TR010039/APP/6.3**). Any increase or redirection of flood risk associated with the Proposed Scheme crossing two drainage ditches located west of Upton Road will be intercepted using appropriately designed drains at the base of the Proposed Scheme embankment. This will divert the flow from the drainage ditches to the east, along the base of the embankment and will tie into the drainage design. This is to be confirmed once drainage surveys have been undertaken.

The proposed increase in areas of hard standing and alteration of ground elevations due to re-profiling would result in an increase in peak flow rates and volumes discharging to the Mill Stream, Wittering Brook, and its tributary, the River Nene and Splash Dyke. Particularly within areas of Flood Zones 2 and 3. Any increase in surface water runoff shall be attenuated using detention basins or oversized pipes. The drainage is designed to attenuate to existing runoff rates and includes a 1 in 100-year storm event plus 20% climate change allowance to allow for changes in peak rainfall intensity. Where carriageway widening or

realignment occurs the additional contributing area will be attenuate to greenfield runoff rates up to a 1 in 100-year storm event plus 40% climate change. Where an attenuation basin is not required, attenuation will be in the form of flow controls and oversized pipes. This will ensure there is no increase in surface water runoff peak flow rate resulting from the Proposed Scheme.

Wittering Brook culvert, embankments, and the widening of the carriageway near Wittering Brook has the potential to alter the conveyance of flow in the floodplain. The flood risk impact of the Proposed Scheme has been fully assessed using hydraulic modelling.

As part of the Proposed Scheme a section of Wittering Brook watercourse would be culverted 10m west from the existing culvert with a minor watercourse realignment. The new box culvert is approximately 60m in length, box shaped with a width of 2.5m and height of 2.5m and is designed to convey a 1 in 100-year peak flow (including a 65% climate change allowance) with a freeboard exceeding 600mm. A natural bed would be installed in the base of the culvert and a mammal ledge provided to maintain connectivity of habitat. During the 1 in 100-year including a 65% climate change allowance scenario a reduction in maximum water depth was observed at the culvert inlet and outlet. A reduction of 200mm upstream and 600mm downstream were observed when compared to the baseline. In addition to this there was a free board increase of 1.12m upstream and 1.01m downstream, when compared to the baseline. This was also tested within the inclusion of flood compensatory storage (designed to 1 in 100-year plus 35% climate change) to mitigate the loss of floodplain caused by the location of the Proposed Scheme. The proposed culvert was shown to pass the required volume and flow to account for floodplain loss in the 1 in 100-year plus 35% climate change event, whilst achieving freeboard requirements in the 1 in 100-year plus 65% climate change event. Due to the levels predicted, it has been assessed that there are major beneficial impacts identified on the floodplain and conveyance of flow for Wittering Brook.

Due to the installation of the new culvert it is deemed there will be minor adverse impacts on the biodiversity of Wittering Brook as a result.

Due to the discharge from the proposed outfalls, flow rates and velocities must be kept to a minimum. All surface water runoff from road runoff must be attenuated to greenfield runoff rates, or no greater than existing where there is no increase in hardstanding, at source using SuDS systems such as attenuation basins. Scour protection downstream of the outfall must be provided to ensure the risk of erosion is minimised. The proposed outfalls must be set back into the bank to minimise the impact on flow conveyance and minimise the impact of erosion and scouring of riverbanks.

Wittering Brook Culvert will result in the loss of riparian banks and bed including associated habitat and the culvert will be constructed to maintain a natural sediment bed at the base of the culvert.

Riparian (buffer) planting will be included along the watercourse at wittering brook culvert and adjacent to the mill stream. This will mitigate the impacts of the new culvert and associated watercourse diversion on the channel morphology including aquatic habitat and to ensure no reduction in WFD status.

These measures noted above will also mitigate impacts to WFD physicochemical, biological, and hydro morphological quality elements of Wittering Brook and the Nene – Islip to Tidal water bodies. Although an impact of minor adverse significance has been identified on Wittering Brook, it is considered not to have an impact on the WFD status of either water bodies

## Summary

The Proposed Scheme is not expected to give rise to significant adverse (moderate or greater) residual effects during the construction or operational phases with the adoption of best practice construction and design measures discussed above. The Proposed Scheme will comply with local, regional, and national policies.

Spined loach were found in one location on the River Nene in 2017 and has not been found in any subsequent surveys. Therefore, it can be concluded that it is unlikely that this individual was from the population in the Nene Washes SAC. Therefore, any changes in water quality in the River Nene will have no likely significant effects upon the population or the water quality in the Nene Washes SAC, which lies 16.3km downstream of the proposed works.

Only three bird species which are designated features of the Nene Washes SPA and Ramsar site were found in the wintering and breeding bird surveys over the study area. In addition, these species were found in such small numbers that it is highly unlikely that these individuals are part of the populations within the SPA and Ramsar site. Therefore, it can be concluded that there will be no likely significant effects upon the populations within the Nene Washes SPA and Ramsar site.

## Appendix C. Planning Inspectorate Screening matrices

### Screening Matrix

Potential effects upon the designated sites which are considered in this assessment are provided below in Table C.1 to be in line with Planning Inspectorate Advice Note 10.

The European site included within the screening assessment is the Nene Washes SAC, SPA and Ramsar.

Table C-1: Potential Effects – Effects considered within the screening matrices

Designation	Effects described in submission information	Presented in screening matrices as
Nene Washes SAC, SPA, Ramsar	<ul style="list-style-type: none"> <li>Displacement from construction noise</li> <li>Displacement from operational noise</li> <li>Displacement from construction vibration</li> <li>Invasive species – threat of displacement from habitats/loss of habitats</li> <li>Mortality from construction and operational traffic</li> </ul>	Displacement
	<ul style="list-style-type: none"> <li>Air emissions during construction</li> <li>Dust from construction</li> <li>Air emissions from road operation</li> <li>Light-spill during construction</li> <li>Lighting during scheme operation</li> </ul>	Reduction in air quality
	<ul style="list-style-type: none"> <li>Construction runoff (earth works, compaction, plant and vehicle washing)</li> <li>Construction dewatering</li> <li>Siltation arising from operational surface water discharge/runoff</li> <li>Exacerbation of erosion and therefore sediment ingress due to the spread of invasive species (particularly Japanese knotweed, Himalayan balsam, and signal crayfish)</li> </ul>	Increased sedimentation
	<ul style="list-style-type: none"> <li>Construction spillages - accidental spillages or leakage of fuels, oils, chemicals, wastewater, concrete, or cement admixtures used particularly around the construction near water.</li> <li>Construction dewatering</li> <li>Piling in-ground structures - Surface water discharge and groundwater contamination</li> </ul>	Reduced water quality



	<ul style="list-style-type: none"> <li>• Acidification of water column and substrate through sediment runoff leading to a reduction in habitat quality.</li> <li>• Eutrophication (cumulative impact with sedimentation) leading to oxygen depletion and increased mortality to aquatic life.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Inappropriate weirs, dams, and other structures – unsuitable designs</li> <li>• Water abstraction and overland discharge of dewatered areas to facilitate construction</li> </ul>	Changes to baseline flow

~~The NSN site included within the screening assessment is the River Wensum SAC.~~

Evidence for, or against, likely significant effects on the NSN site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrix below in Table C.2.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded

✗ = Likely significant effect **can** be excluded

C = construction

O = operation

D = decommissioning<sup>12</sup>

Where effects are not relevant to a particular feature the matrix cell should be formatted as follows:

<sup>12</sup> It is considered unlikely that the Proposed Scheme would ever be fully decommissioned. As such, no likely significant effects are reasonably foreseeable on any NSN site from decommissioning

Table C-2: The Nene Washes SAC Planning Inspectorate screening matrix.

Name of European site and designation: Nene Washes SAC																		
EU Code: UK0030222																		
Distance to NSIP: 10km overland, 16km through effect pathway identified along the River Nene																		
European site features	Likely effects of NSIP																	
Effect	Displacement			Decreased air quality			Increased sedimentation			Reduced water quality			Changes to baseline flow			In-combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
<i>Spined Loach</i>	X <sub>a,b</sub>	X <sub>b</sub>	N/A	X <sub>c</sub>	X <sub>c</sub>	N/A	X <sub>a,d</sub>	X <sub>e</sub>	N/A	X <sub>d,f,g</sub>	X <sub>e</sub>	N/A	X <sub>h</sub>	X <sub>e</sub>	N/A	X <sub>i</sub>	X <sub>i</sub>	N/A

The notes containing evidence supporting the above conclusions can be found overleaf corresponding with the relevant letters (a,b,c,d etc.) within the matrix.

a

The spread of invasive species present onsite will be prevented through standard construction best practice; this will include strict [biosecurity mitigation](#) measures as detailed in [Appendix BEMP, REAC BD6](#).

b

Noise and vibration assessments have been undertaken, however effects on the primary and qualifying features have been screened out, as spined loach were found in two locations in the study area only during the 2017 surveys and were not found in surveys during 2018. In addition, it is considered that the population is not substantial enough to impact the population in the SAC, which lies is approximately 16.3km through the affect pathway away from the study area. Operational vibration effects were also scoped out of the assessment as per standard practice guidance. As such, no adverse likely significant effects of displacement are reasonably foreseeable as a result of noise and vibratory effects during the construction and operational phases of the Proposed Scheme.

*c*

Given the distance of the Proposed Scheme from the Nene Washes SAC, the fact that the City of Peterborough lies between the Proposed Scheme location and the SAC, and lack of impact pathways identified for these factors it is considered there would be no reasonably foreseeable likely significant effect on the SAC from lighting or air quality as a result of the Proposed Scheme.

*d*

The works are located approximately 16km upstream of the confluence of the River Nene SAC (the effect pathway). Therefore, any increase in contaminants or sedimentation is likely to be highly diluted by the time it reaches the SAC. Standard construction best practice guidelines. Guidelines include those for material storage and the development of a construction-phase drainage system (including compound drainage) to prevent pollution pathways and reduce local flood-risk will minimise contaminants and sediments from construction from entering the River Nene and its tributaries.

*e*

The Proposed Scheme has been designed taking into account best practice measures to reduce sedimentation and discharge of contaminants into the wider environment during operation. New drainage systems along the mainline carriageway will include standard pollution control devices providing treatment of the surface water runoff and maintain greenfield discharge rates to receiving watercourses or groundwater. Any existing overland flows to be interrupted would be intercepted by new ditches or pipe crossings. Drainage systems and soakaway provisions have been incorporated into the design of new structures. Best practice design measures to eliminate groundwater contamination during the operation of the Proposed Scheme will also be incorporated into the design. This includes consideration of structures to minimise obstruction of groundwater flows, with materials to be chosen to minimise groundwater contamination via direct contact through the life of the Proposed Scheme.

*f*

Due to the distance between the Proposed Scheme and NSN any surface or groundwater pollutants introduced would be highly diluted and dispersed by the time it reached the downstream SAC. Nevertheless, best practice construction

and design measures regarding pollution prevention will be detailed in the EMP including emergency response procedures and provision of spill kits will further reduce the likelihood of these events.

*g*

Best practice design and construction measures are to be implemented within the EMP. Further details of these elements required on a statutory basis are presented in Appendix B.

*h*

~~No abstraction or dewatering will be undertaken that will affect the SAC. Nonetheless, if~~ abstraction from the aquifer ~~is~~ was to be required ~~onsite and~~ consent must be sought from the Environment Agency and a. Any consents granted must include measures for minimising pollution and risk to any designated site. ~~This will also be the case for dewatering for which a bespoke consent would be required.~~ As such, as any abstraction and dewatering would have to be agreed with the Environment Agency taking into account the NSN, there is no likely foreseeable impact of this potential hazard to the designated site.

*i*

There are no identified projects within the ZOI anticipated to result in significant effects that would require additional mitigation in response to cumulative effects. None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes Ramsar.

## Nene Washes SPA

Table C.3 Screening matrix of the potential likely significant effects upon Nene Washes SPA.

Name of European Site and Designation: Nene Washes SPA
EU Code: UK9008031



Distance to NSIP: 10km overland, 16km through effect pathway identified along the River Nene															
European site features	Likely effects of NSIP														
Effect	Mortality - pollution			Mortality - collision			Mortality – reduced food sources/ loss of habitat			Reduced breeding success – noise disturbance			In-combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Teal	x a	x a	n/a	x	x a	n/a	x a	x a	n/a	x a	x a	n/a	x d	x d	n/a
Gadwall	x b	x b	n/a	x b	x b	n/a	x b	x	n/a	x b	x b	n/a	x d	x d	n/a
Wigeon	x b	x b	n/a	x b	x b	n/a	x b	x	n/a	x b	x b	n/a	x d	x d	n/a
Pintail	x b	x b	n/a	x b	x b	n/a	x b	x	n/a	x b	x b	n/a	x d	x d	n/a
Shoveler	x b	x b	n/a	x b	x b	n/a	n/a	n/a	n/a	x b	x b	n/a	x d	x d	n/a
Black-tailed godwit	x c	x c	n/a	x c	x c	n/a	n/a	n/a	n/a	x c	x c	n/a	x d	x d	n/a
Bewick's swan	x b	x b	n/a	x b	x b	n/a	x b	x b	n/a	x b	x b	n/a	x d	x d	n/a
<u>Garganey</u>	<u>x b</u>	<u>x b</u>	<u>n/a</u>	<u>x b</u>	<u>x b</u>	<u>n/a</u>	<u>x b</u>	<u>x b</u>	<u>n/a</u>	<u>x b</u>	<u>x b</u>	<u>n/a</u>	<u>x d</u>	<u>x d</u>	<u>n/a</u>

The notes containing evidence supporting the above conclusions can be found overleaf corresponding with the relevant letters (a,b,c,d etc.) within the matrix.

a

For gadwall and teal, the loss of their required habitat will be minimal and is not considered to have a likely significant effect. Wintering and breeding bird surveys undertaken in 2020 recorded gadwall and teal in small numbers which suggests that these individuals are not part of the larger population in the Nene Washes SPA. Therefore, it is considered that there will be no LSE upon the features of the Nene Washes SPA as a result of mortality caused by pollution, collision and reduced food sources or a reduction of breeding success due to noise disturbance caused by the construction and operation of the Proposed Scheme.

~~The Proposed Scheme is near the existing A47 in an environment dominated by road noise, it is considered unlikely that the qualifying bird species will be found in the vicinity of the road and therefore the likelihood of displacement due to noise, habitat loss and lighting is minimal. In addition, these species were recorded in low numbers and are therefore not considered to be part of a larger population in the Nene Washes SPA.~~

*b*

Bewick's swan, pintail, ~~Shovelers~~shoveler, garganey and wigeon were not recorded as present within the study area during the wintering or breeding bird surveys. Although the arable fields are likely to provide a food source during the winter, it is considered likely that there is more suitable foraging habitat within and closer to the boundary of the SPA. It is therefore considered unlikely that the construction and operation of the Proposed Scheme will result in mortality caused by pollution, collision and reduced food sources or a reduction of breeding success due to noise disturbance caused by the construction and operation of the Proposed Scheme. ~~It is considered that the loss of agricultural grassland/arable land is not likely to be significant for these species. No likely significant effect is expected.~~

*c*

Black-tailed godwit were not recorded during the wintering bird surveys and it is unlikely they would be found in the vicinity of the Proposed Scheme due to lack of suitable habitat. No likely significant effect is expected.

*d*

There are no identified projects within the ZOI anticipated to result in significant effects that would require additional mitigation in response to cumulative effects. None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes Ramsar.

## Nene Washes Ramsar

Table C-3 Screening matrix of the potential likely significant effects upon Nene Washes Ramsar.

Name of European Site and Designation: Nene Washes Ramsar															
EU Code: N/A															
Distance to NSIP: 10km overland, 16km through effect pathway identified along the River Nene															
European site features	Likely effects of NSIP														
Effect	Mortality - pollution			Mortality - collision			Mortality – reduced food sources/ loss of habitat			Reduced breeding success – noise disturbance			In-combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Teal	x <sub>a</sub>	x <sub>a</sub>	n/a	x	x <sub>a</sub>	n/a	x <sub>a_e</sub>	x <sub>a</sub>	n/a	x <sub>a</sub>	x <sub>a</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Gadwall	x <sub>a</sub>	x <sub>a</sub>	n/a	x	x <sub>a</sub>	n/a	x <sub>a</sub>	x <sub>a</sub>	n/a	x <sub>a</sub>	x <sub>a</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Wigeon	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b_e</sub>	x	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Pintail	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b_e</sub>	x	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Shoveler	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	n/a	n/a	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Black-tailed godwit	x <sub>c</sub>	x <sub>c</sub>	n/a	x <sub>c</sub>	x <sub>c</sub>	n/a	n/a	n/a	n/a	x <sub>c</sub>	x <sub>c</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Golden plover	x <sub>a</sub>	x <sub>a</sub>	n/a	x	x <sub>a</sub>	n/a	x <sub>a_e</sub>	x <sub>a</sub>	n/a	x <sub>a</sub>	x <sub>a</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Ruff	x <sub>c</sub>	x <sub>c</sub>	n/a	x <sub>c</sub>	x <sub>c</sub>	n/a	n/a	n/a	n/a	x <sub>c</sub>	x <sub>c</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Bewick's swan	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b_e</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Whooper Swan	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b_e</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Pochard	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>b_e</sub>	x <sub>b</sub>	n/a	x <sub>b</sub>	x <sub>b</sub>	n/a	x <sub>d</sub>	x <sub>d</sub>	n/a
Garganey															

The notes containing evidence supporting the above conclusions can be found overleaf corresponding with the relevant letters (a,b,c,d etc.) within the matrix.

a

~~For golden plover, gadwall and teal, the loss of their required habitat will be minimal is not considered to have a likely significant effect. The Proposed Scheme is near the existing A47 in an environment dominated by road noise, it is considered unlikely that the qualifying bird species will be found in the vicinity of the road and therefore the likelihood of displacement due to noise, habitat loss and lighting is minimal. In addition, these species were recorded in low numbers and are therefore not considered to be part of a larger population in the Nene Washes SPA. For gadwall and teal, the loss of their required habitat will be minimal and is not considered to have a likely significant effect. Wintering and breeding bird surveys undertaken in 2020 recorded gadwall and teal in small numbers which suggests that these individuals are not part of the larger population in the Nene Washes SPA. Therefore, it is considered that there will be no LSE upon the features of the Nene Washes as a result of mortality caused by pollution, collision and reduced food sources or reduced breeding success due to noise disturbance caused by the construction and operation of the Proposed Scheme.~~

b

Whooper swan, Bewick's swan, pintail, ~~Shovelers~~shoveler, ~~garganey~~, pochard and wigeon were not recorded as present within the study area during the wintering or breeding bird surveys. Although the arable fields are likely to provide a food source during the winter, it is considered likely that there is more suitable foraging habitat within and closer to the boundary of the SPA. ~~It is therefore considered unlikely that the construction and operation of the pProposed sScheme will result in mortality caused by pollution, collision and reduced food sources or reduced breeding success due to noise disturbance to these species. It is considered that the loss of agricultural grassland/arable land is not likely to be significant for these species. No likely significant effect is expected.~~



**c**

Black-tailed godwit and ruff were not recorded during the wintering bird surveys and it is unlikely they would be found in the vicinity of the Proposed Scheme due to lack of suitable habitat. No likely significant effect is expected.

**d**

There are no identified projects within the ZOI anticipated to result in significant effects that would require additional mitigation in response to cumulative effects. None of the other sections of the A47 improvements programme are close enough either geographically or in programming time to consider an in-combination effect on the Nene Washes Ramsar.

**e** The spread of invasive species present onsite will be prevented through standard construction best practice; this will include strict mitigation measures as detailed in the EMP, REAC BD6.

**f** The breeding bird, plant and invertebrate species listed under criterion 2 will not be impacted by the pProposed Sscheme due to the distance involved between the scheme and the RAMSAR site.

## **Appendix D. Characteristics, vulnerabilities, and conservation objectives of Nene Washes NSN sites**

Table D-15 Characteristics, vulnerabilities, and conservation objectives of Nene Washes SPA site features

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
Nene Washes SPA	Bewick's swan (non-breeding)	Population abundance	Restore the size of the non-breeding Bewick's Swan population to a level which is above 1300 individuals whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	<p>Maintaining or restoring bird abundance depends on the suitability of the site. However, factors affecting suitability can also determine other demographic rates of birds using the site including survival (dependent on factors such as body condition which influences the ability to breed or make foraging and/or migration movements) and breeding productivity. Adverse anthropogenic impacts on either of these rates may precede changes in population abundance (e.g. by changing proportions of birds of different ages) but eventually may negatively affect abundance. These rates can be measured/estimated to inform judgements of likely impacts on abundance targets.</p> <p>Since the SPA was notified there has been a substantial decline in the numbers of Bewick's swans travelling to Britain, probably because milder winters in Europe provide suitable conditions closer to breeding grounds. If the climate trend continues, numbers on the Nene Washes are unlikely to recover.</p>
		Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of suitable supporting habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding).	<p>Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age, and accuracy of data collection. This target may apply to supporting habitat which also lies outside the site boundary.</p> <p>Birds also fly out to the surrounding agricultural land to feed, however currently little is known about their preferred locations, distances travelled and faithfulness to specific sites.</p>
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	<p>The structure and function of habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of its habitat substrate, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of nesting, feeding or roosting habitats.</p> <p>No critical loads have been set for freshwater habitats used by wintering Bewick's swan. This does not mean no effect of nitrogen or acid deposition. Nitrogen deposition will affect total nitrogen</p>

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				levels in the ditch water, which are known to be high enough to affect the species composition, but there are likely to be other sources with greater contributions. Terrestrial habitats used for feeding are not thought to be sensitive to acid or nitrogen deposition.
		Connectivity with supporting habitats	Maintain the safe passage of Bewick's swans moving between roosting and feeding areas.	<p>The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to their fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.</p> <p>Powerlines and wind turbines present a danger to swans. They are particularly vulnerable when flying in flocks from roosts to feeding or loafing areas due to their low manoeuvrability in flight. Where possible powerlines should be dug into the ground or marked with bird flight deflectors, and windfarms located away from known flight paths.</p>
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	<p>Active and ongoing conservation management is often needed to protect, maintain or restore this feature at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target.</p> <p>Livestock grazing and hay cutting in summer to reduce grassland sward height and rank vegetation; partial winter flooding to maintain suitable conditions for wintering birds; flood defence operations and river channel management; minimising disturbance; removal of sediment in ditches to prevent the accumulation of silt and control of invasive non-native species.</p>
		Food availability within supporting habitat	Maintain the availability of cereal grains, rape, potatoes and sugar beet, where these sources are locally important to feeding flocks.	<p>The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.</p> <p>Bewick's swans tend to feed on arable land outside the SPA, returning to the washes to roost.</p>
		Hydrology/flow	Maintain hydrological processes to ensure continuity of water availability in feeding sites,	Changes in source, depth, duration, frequency, magnitude and timing of water supply or flow can have important implications for this feature. Such changes may affect the quality and suitability of habitats used by birds for nesting, drinking, preening, rearing,



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			with visible areas of standing shallow water during non-breeding period.	feeding or roosting. Unless these have already been undertaken, further site-specific investigations may be required to fully inform conservation measures for this feature and/or the likelihood of impacts on this attribute.
		Water area	Maintain the number of large waterbodies of optimal size (typically >10 ha).	<p>This feature depends on the presence and continuity of open water habitat; often requiring water bodies of a particular size to in order to successfully nest, rear their young, feed and/or roost. Changes in water area, and associated marginal habitat, can adversely affect the suitability of supporting open water habitat.</p> <p>Roosting sites are greatly affected by water levels within the washes. Water availability over the wintering period is not limited, and this is not expected to change with climate change. When there is a necessity to use the flood storage function of the Nene Washes, the area of waterbodies increases. Otherwise, the water level is determined by the Water Level Management Plan which ensures there are several large waterbodies during the wintering period.</p>
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	<p>For many SPA features which are dependent on wetland habitats supported by surface water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year during key stages of their life cycle. Poor water quality and inadequate quantities of water can adversely affect the availability and suitability of breeding, rearing, feeding and roosting habitats.</p> <p>Recent water quality data shows that water quality in Moreton's Leam is marginally within the acceptable limits for total phosphorus but is high for total nitrogen. Field drains are similar, but water quality is slightly worse; this could either be due to the influences of cattle grazing or to the release of nutrients bound to the sediment. Good water quality is important for a diverse macrophyte community</p>
		Minimising disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance within close proximity of affecting roosting, foraging, feeding, moulting and/or loafing birds so that the feature is not significantly disturbed.	<p>The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their</p>

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				<p>distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, presence of people, animals and structures.</p> <p>Wildfowling causes disturbance to wintering birds until the end of January, particularly in the Low Wash and the High Wash.</p> <p>Land management activities likely to cause disturbance are generally limited to the period between August and October.</p>
		Landscape	Maintain open and unobstructed terrain within and around roosting and feeding areas, with no overall decrease in field sizes.	<p>Often there is a need to maintain an unobstructed line of sight within feeding and roosting habitat to detect approaching predators, or to ensure visibility of displaying behaviour. An open landscape may also be required to facilitate movement of birds between the SPA and any off-site supporting habitat.</p> <p>Open landscapes have been maintained by RSPB removing/pollarding large willow trees that may serve as perching places for predators within their land holdings. EA also have a tree and bush removal strategy within their maintenance plan to maintain bank stability where grass cover has become reduced, or they serve as cover for predators. Ditches, rather than fences or hedges, mark field boundaries and provide stock control.</p>
		Vegetation characteristics	Maintain the extent and distribution of predominantly short (<10 cm) grassland swards in areas used by Bewick's swans for feeding.	<p>The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful foraging. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature.</p> <p>The grassland habitats are managed through a mixture of summer grazing and hay cutting/topping by local graziers/contractors/landowners/agencies to achieve the ideal sward height for wintering birds.</p>
	Wigeon (non-breeding)	Population abundance	Maintain the size of the non-breeding Wigeon population at a level which is above 3540 individuals, whilst avoiding deterioration from its current level as	The wigeon population has increased by several times since SSSI notification baselines were set. The increase could be due to the more suitable management of March Farmers and sub-optimal conditions at the Ouse Washes leading birds to move between sites. Numbers in Britain have increased by about two thirds since the SPA was notified

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			indicated by the latest mean peak count or equivalent.	
		Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports non-breeding Wigeon for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding).	As per Bewick's swan
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan. No critical loads have been set for freshwater habitats used by wintering wigeon. This does not mean no effect of nitrogen or acid deposition. Nitrogen deposition will affect total nitrogen levels in the ditch water, which are known to be high enough to affect the species composition, but there are likely to be other sources with greater contributions. Terrestrial habitats used for feeding are not thought to be sensitive to acid or nitrogen deposition.
		Connectivity with supporting habitats	Maintain the availability of grasslands in close proximity (typically <50 m) to open water bodies. Maintain the safe passage of wigeon moving between roosting and feeding areas during the non-breeding period.	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to their survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Food availability within supporting habitat	Maintain the cover/abundance of preferred food plants (particularly grasses and aquatic macrophytes).	The availability of an abundant food supply is critically important for adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. Maintaining areas of grassland within the SPA is important for wigeon grazing, but they are also known to feed on arable land off site.
		Water quality/ quantity	Ensure water quality and quantity is restored to a standard which provides the necessary conditions to sustain the supporting habitats of non-breeding wigeon.	As per Bewick's swan. Water quality data collected in 2015 shows that water quality in Moreton's Leam is marginally within acceptable limits for total phosphorus but is high for total nitrogen. Field drains are similar, but water quality is slightly worse; this could either be due to the influence of cattle grazing or to the release of nutrients from the sediment. Good water quality is important for a diverse macrophyte assemblage.
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the wigeon feature is not significantly disturbed.	As per Bewick's swan Wildfowling causes disturbance to wintering birds until the end of January, particularly in the Low Wash and the High Wash. Land management activities likely to cause disturbance are generally limited to the period between August and October.
		Landscape	Maintain open and unobstructed terrain within and around feeding and roosting areas used by wigeon during the non-breeding period.	As per Bewick's swan
		Vegetation characteristics	Maintain the extent and distribution of predominantly short (<5 cm) swards in areas used by wigeon for feeding.	As per Bewick's swan
	Gadwall (breeding)	Population abundance	Maintain the size of the breeding gadwall population at a level which is above 25	As per Bewick's swan



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	
		Extent and distribution of supporting breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding).	As per Bewick's swan The most important habitats for breeding gadwall within the Nene Washes are water-filled scrapes (for feeding), field drains and swamp.
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-Relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan No critical loads have been set for freshwater habitats used by breeding gadwall. This does not mean no effect of nitrogen or acid deposition. Nitrogen deposition will affect total nitrogen levels in the ditch water, which are known to be high enough to affect the species composition, but there are likely to be other sources with greater contributions.
		Conservation measure	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the breeding Gadwall feature and its supporting habitats.	Livestock grazing and hay cutting in summer to reduce grassland sward height and rank vegetation; partial winter flooding to maintain suitable conditions for wintering birds; water reduction in areas in spring/summer months for breeding birds whilst maintaining some areas of shallow flooding for feeding; flood defence operations and river channel management; minimising disturbance; control of some predators and corvids; removal and control of injurious weeds; removal of sediment in ditches to prevent the accumulation of silt and control of invasive non-native species; control of access and recreational activities.
		Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. hatching midges) at preferred prey sizes. Maintain a high cover/abundance of food plants preferred by breeding	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			Gadwall (aquatic macrophyte and emergent plants, a variety of seeds).	
		Hydrology	Maintain the hydrology of a waterbody used as a feeding site such that water levels reduce (or are reduced) by 5-15% each month from the time of mean hatch date to the end of the breeding season.	<p>Changes in source, depth, duration, frequency, magnitude and timing of water supply or flow can have important implications for this feature. Such changes may affect the quality and suitability of habitats used by birds for nesting, drinking, preening, rearing, feeding or roosting. Unless these have already been undertaken, further site-specific investigations may be required to fully inform conservation measures for this feature and/or the likelihood of impacts on gadwall.</p> <p>There has been a Water Level Management Plan (WLMP) in place since 2000 with a review in 2007. Internal water control structures mean that greater control over water levels in temporary pools can be achieved, but they need regular attention during the nesting season.</p>
		Water depth	Maintain the availability of standing water of optimal depth, typically <0.25m deep.	This feature is known to require extensive areas of water in which to feed. Birds are visual predators, with some having the ability to dive or to feed from the surface. As they will rely on detecting their prey within the water to hunt, the depth of water at critical times of year may be paramount for successful feeding and therefore their fitness and survival. Deep water surrounding nesting sites may also be important to deterring predators.
		Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	<p>As per Bewicks's swan</p> <p>Breeding success can depend on summertime water levels in ditches. High summer retention levels in the ditches need to be achieved by March. A review of the Water Level Management Plan is underway, addressing concerns over summer water shortages and how to prevent the impacts of predicted increased winter flooding from affecting the breeding season.</p>
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting nesting, roosting, foraging, feeding, moulting and/or loafing birds so that the breeding Gadwall	<p>As per Bewick's swan</p> <p>Anglers are able to use Moreton's Leam, but aren't thought to cause a disturbance problem. Public access is along a footpath on the South Barrier Bank; it is little used and far enough away from the centre of the washes to be unlikely to cause significant disturbance.</p>

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			population is not significantly disturbed.	
		Predation	Reduce predation of and disturbance to breeding Gadwall caused by native and non-native predators.	<p>This will ensure that breeding productivity (number of chicks per pair) and survival are sustained at rates that maintain or restore the abundance of the feature. Impacts to breeding productivity can result directly from predation of eggs, chicks, juveniles and adults, and also from significant disturbance. The presence of predators can influence bird behaviours, such as abandonment of nest sites or reduction of effective feeding. Where evidence suggests predator management is required, measures can include their exclusion through fencing and scaring or by direct control. Any such measures must consider the legal protection of some predators, as well as the likely effects of such control on other qualifying features.</p> <p>Trees and scrub are removed or regularly coppiced to reduce avian predator perches. Anti-predator fencing surrounds much of the Low Wash to reduce terrestrial predation. Crow, fox and mink control are carried out within the SPA.</p>
		Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60cm) within nesting areas that are typically <50 m from the water's edge.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful nesting/ rearing/ concealment/roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature.
	Gadwall (non-breeding)	Population abundance	Maintain the size of the non-breeding Gadwall population at a level which is above 95 individuals whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	<p>As per Bewick's swan</p> <p>The gadwall population nationally has more than doubled since notification, and the population on the Nene Washes has increased by a similar proportion.</p>
		Extent and distribution of supporting breeding habitat	Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of	Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			the non-breeding/wintering period moulting, roosting, loafing, feeding).	data collection. This target may apply to supporting habitat which also lies outside the site boundary. Gadwall requires shallow water for feeding.
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan No critical loads have been set for freshwater habitats used by wintering gadwall.
		Conservation measure	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to restore the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Water depth	Maintain the availability of standing water of optimal depth, typically <0.25m deep over at least 50% of the total standing water area.	This feature is known to require extensive areas of water in which to feed. Birds are visual predators, with some having the ability to dive or to feed from the surface. As they will rely on detecting their prey within the water to hunt, the depth of water at critical times of year may be paramount for successful feeding and therefore their fitness and survival. Deep water surrounding nesting sites may also be important to deterring predators.
		Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the SPA Conservation Objectives but in some cases more stringent standards may be needed to support the SPA feature. Further site-specific investigations may be required to establish appropriate standards for the SPA.



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting nesting, roosting, foraging, feeding, moulting and/or loafing birds so that the breeding Gadwall population is not significantly disturbed.	As per Bewick's swan
		Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. hatching midges) at preferred prey sizes. Maintain a high cover/abundance of food plants preferred by breeding Gadwall (aquatic macrophyte and emergent plants, a variety of seeds).	As per Bewick's swan
	Teal (non-breeding)	Population abundance	Maintain the size of the non-breeding Teal population at a level which is above 980 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	As per Bewick's swan
		Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding).	Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. This target may apply to supporting habitat which also lies outside the site boundary. Teal requires shallow water for feeding
		Air quality	Maintain concentrations and deposition of air pollutants	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	No critical loads have been set for freshwater habitats used by wintering teal.
		Connectivity with supporting habitats	Maintain the safe passage of non-breeding teal moving between roosting and feeding areas.	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to their breeding success and to the adult fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Food availability within supporting habitat	Maintain the availability of cereal grains, where these sources are locally important to feeding flocks. Maintain the cover/abundance of preferred food plants (e.g. <i>Polygonum</i> , <i>Eleocharis</i> , <i>Rumex</i> , <i>Ranunculus</i> ) and the availability of key prey species (e.g. <i>Hydrobia</i> , flies, caddisfly, beetles, bugs, hatching midges) at preferred prey sizes.	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.
		Water depth	Maintain the availability of standing water of optimal depth, typically <0.1 m deep.	As per gadwall (non-breeding)

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan and gadwall (non-breeding)
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the non-breeding teal population is not significantly disturbed.	As per Bewick's swan
	Pintail (non-breeding)	Population abundance	Maintain the size of the non-breeding Pintail population at a level which is above 440 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	As per Bewick's swan
		Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding).	As per Bewick's swan Pintail requires shallow water for feeding.
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air	As per Bewick's swan No critical loads have been set for freshwater habitats used by wintering pintail.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			Pollution Information System.	
		Connectivity with supporting habitats	Maintain the safe passage of pintail moving between roosting and feeding areas during the non-breeding period.	The ability of the feature to safely and successfully move to and from feeding and roosting areas is critical to their breeding success and to the adult fitness and survival. This target will apply within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Food availability within supporting habitat	Maintain availability of key prey species (hatching midges, insects, molluscs and crustaceans, <i>Hydrobia</i> ) of preferred prey sizes and cover/abundance of preferred food plants (e.g. <i>Potamogeton</i> , <i>Elodea</i> , <i>Rumex</i> , <i>Glyceria</i> , <i>Chara</i> ).	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.
		Water depth	Maintain the availability of standing water at optimal depths, typically 0.1-0.3m deep.	As per gadwall (non-breeding)
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan and gadwall (non-breeding)



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the non-breeding pintail population is not significantly disturbed.	As per Bewick's swan
	Garganey (breeding)	Population abundance	Maintain the size of the breeding garganey population at a level which is above 5 pairs whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	As per Bewick's swan
		Extent and distribution of supporting breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding).	As per Bewick's Swan Garganey requires shallow pools for feeding, and tall grass in close vicinity of feeding areas for nesting.
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan No critical loads have been set for freshwater habitats used by breeding garganey.
		Conservation measure	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to Maintain the structure, function and/or the supporting processes	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			associated with the feature and its supporting habitats.	
		Food availability within supporting habitat	<p>Maintain the availability of cereal grains and potatoes, where these sources are locally important to feeding flocks.</p> <p>Maintain availability of key prey species (hatching midges, insects, molluscs and crustaceans, <i>Hydrobia</i>) of preferred prey sizes and cover/abundance of preferred food plants (e.g. <i>Potamogeton</i>, <i>Elodea</i>, <i>Rumex</i>, <i>Glyceria</i>, <i>Chara</i>).</p>	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.
		Hydrology/flow	<p>Maintain water availability in feeding sites to provide areas of shallow water.</p> <p>Maintain the hydrology of a waterbody used as a feeding site such that water levels reduce (or are reduced) each month from the time of mean hatch date to the end of the breeding season.</p>	Changes in source, depth, duration, frequency, magnitude and timing of water supply or flow can have important implications for this feature. Such changes may affect the quality and suitability of habitats used by birds for nesting, drinking, preening, rearing, feeding or roosting. Unless these have already been undertaken, further site-specific investigations may be required to fully inform conservation measures for this feature and/or the likelihood of impacts on this attribute.
		Water depth	Maintain the availability of standing water at optimal depths, typically 0.1-0.3 m deep.	As per gadwall (non-breeding)
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Minimising disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting nesting, roosting, foraging, feeding, moulting and/or loafing- birds so that the breeding Garganey population feature is not significantly disturbed.	As per Bewick's swan
		Predation	Reduce predation of and disturbance to breeding Garganey caused by native and non-native predators.	<p>This will ensure that breeding productivity (number of chicks per pair) and survival are sustained at rates that maintain or restore the abundance of the feature. Impacts to breeding productivity can result directly from predation of eggs, chicks, juveniles and adults, and also from significant disturbance. The presence of predators can influence bird behaviours, such as abandonment of nest sites or reduction of effective feeding. Where evidence suggests predator management is required, measures can include their exclusion through fencing and scaring or by direct control. Any such measures must consider the legal protection of some predators, as well as the likely effects of such control on other qualifying features.</p> <p>Trees and scrub are removed or regularly coppiced to reduce avian predator perches. Anti-predator fencing surrounds much of the Low Wash to reduce terrestrial predation. Crow, fox and mink control are carried out within the SPA.</p>
		Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas that are typically <50 m from the water's edge.	As per gadwall (breeding)
	Shoveler (non-breeding)	Population abundance	Maintain the size of the non-breeding Shoveler population at a level which is above 110 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
		Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period moulting, roosting, loafing, feeding).	As per Bewick's swan Shoveler <del>are</del> <u>is</u> a filter-feeders, most likely to be found on shallow water.
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan No critical loads have been set for freshwater habitats used by wintering shoveler.
		Connectivity with supporting habitats	Maintain the safe passage of shoveler moving between roosting and feeding areas during the non-breeding period.	As per pintail (non-breeding). Shoveler require surface water on which to feed and roost
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to Maintain the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Food availability within supporting habitat	Maintain the high cover/abundance of preferred food plants (seeds of aquatic and marginal vegetation). Maintain the distribution, abundance and availability	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			of key prey items (small insects, crustaceans, molluscs at preferred prey sizes.	
		Water depth	Maintain the availability of standing water at optimal depth, typically <0.3 m deep.	As per gadwall (non-breeding)
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is restored to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan
		Minimising disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the non-breeding shoveler population is not significantly disturbed.	As per Bewick's swan
	Shoveler (breeding)	Population abundance	Maintain the size of the breeding Shoveler population at a level which is above 36 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	As per Bewick's swan
		Extent and distribution of supporting breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle	As per Bewick's swan Shoveler requires water with shallow margins and plenty of macrophytes for feeding. Nests are usually hidden in tall grass, but reed bed can also be used, and sometimes even more open conditions in shorter grassland.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			(courtship, nesting, feeding).	
		Air quality	Maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan Critical loads for both nitrogen deposition and acid deposition are exceeded on the grassland habitats used by breeding shoveler at the Nene Washes.
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Food availability within supporting habitats	Maintain high cover/abundance of preferred food plants (seeds of aquatic and marginal vegetation). Maintain the distribution, abundance and availability of key prey items (small insects, crustaceans, molluscs) at preferred prey sizes.	The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.
		Hydrology/flow	Maintain water availability in feeding sites to provide shallow surface water and damp field conditions. Maintain the hydrology of a waterbody used as a feeding site such that water levels reduce (or are	Changes in source, depth, duration, frequency, magnitude and timing of water supply or flow can have important implications for this feature. Such changes may affect the quality and suitability of habitats used by birds for nesting, drinking, preening, rearing, feeding or roosting. Unless these have already been undertaken, further site-specific investigations may be required to fully inform conservation measures for this feature and/or the likelihood of impacts on this attribute

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			reduced) from the time of mean hatch date to the end of the breeding season.	
		Water depth	Maintain the availability of standing water at optimal depth, typically <0.3 m deep.	As per gadwall (non-breeding)
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water, restore water quality and quantity to a standard which provides the necessary conditions to support breeding Shoveler.	As per Bewick's swan
		Minimising disturbance caused by human activity	Reduce the frequency, duration and/or intensity of disturbance affecting nesting, roosting, foraging, feeding, moulting and/or loafing birds so that the breeding Shoveler population feature is not significantly disturbed.	As per Bewick's swan
		Predation	Reduce the predation of and disturbance to breeding Shoveler caused by native and non-native predators.	As per garganey (breeding)
		Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas.	As per gadwall (breeding)
	Black-tailed godwit (breeding)	Population abundance	Maintain the size of the breeding Black-tailed godwit population at a level which is above 16 pairs, whilst avoiding deterioration from its current level as indicated	As per Bewick's swan While the feature is currently in favourable condition, the population has been in decline for some time because breeding productivity is much lower than required to maintain the population. Notification occurred at a time when black-tailed godwit were new to the Nene Washes and numbers subsequently rose; the subsequent decline is thought to be particularly due to predation.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			by the latest mean peak count or equivalent.	'Project godwit' is using head starting to boost population numbers and fencing to reduce predation.
		Extent and distribution of supporting breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding).	As per Bewick's swan Although they have bred in other areas of the site (historically in the Ring's End section), the black-tailed godwit population has nested only in a small number of fields in the Low Wash for many years. The intention is to restore March Farmers to habitat suitable for black-tailed godwit nesting. Breeding black-tailed godwit requires wet grassland with a short but variable sward with a mean height on April 1st of < 5 cm and shallow foods at the beginning of the nesting season Shallow spring floods on 15-20% of site on 1st Apr. Ground water table within 20 cm of surface over 50% area from April to June
		Air quality	Restore concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	As per Bewick's swan Critical loads for both nitrogen deposition and acid deposition are exceeded on the grassland habitats used by breeding black-tailed godwit at the Nene Washes. Levels of nitrogen and acid deposition are high enough to change the habitat, causing an increase in sward height and a decrease in diversity. APIS assesses the species as sensitive to these changes, and therefore a restore target has been set. While the feature is currently in favourable condition, the population has been in decline for some time because breeding productivity is much lower than required to maintain the population.
		Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with the feature and its supporting habitats.	As per Bewick's swan
		Food availability within supporting habitat.	Maintain an abundance of available prey (soil invertebrates, particularly	As per shoveler (breeding)



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			earthworms, in the pre-breeding period, and increasingly above-ground invertebrates for the chicks and as the summer progresses) at prey sizes preferred by Black-tailed godwit.	
		Grazing animals	Maintain the density of livestock at suitable levels within breeding areas; typically no more than 0.75 livestock units per hectare between 01 April and 31 May.	Grazing by livestock is often necessary for the management of the site in order to maintain the structure of supporting habitats in a favourable condition. However, if livestock numbers are too high during the breeding season, nests may be inadvertently trampled by grazing animals and successful nesting/rearing is undermined. This feature is known to be particularly sensitive to livestock density.  Sward height is managed through grazing the previous summer and through winter grazing of wildfowl. Cattle grazing usually doesn't occur at all until the middle of May.
		Hydrology/flow	Maintain high groundwater tables to provide surface water and/or damp field conditions with typically 20-30% of the area soggy or flooded overall.  Groundwater table to be within 20 cm of the surface over at least 50% of the area.	As per shoveler (breeding)  This requires carefully balancing the removal of floodwater from the site with retaining sufficient water through management of water control structures (and occasionally pumping water onto the site in dry winters)
		Water quality/quantity	Where the supporting habitats of the SPA feature are dependent on surface water, restore water quality and quantity to a standard which provides the necessary conditions to support the feature.	As per Bewick's swan  Breeding success can depend on summertime water levels in ditches. High summer retention levels in the ditches need to be achieved by March. A review of the Water Level Management Plan is underway, addressing concerns over summer water shortages and how to prevent the impacts of predicted increased winter flooding from affecting the breeding season.
		Minimising disturbance cause by human activity	Restrict the frequency, duration and/or intensity of disturbance of nesting,	As per Bewick's swan

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			roosting, foraging, feeding, moulting and/or loafing birds so that the breeding Black-tailed godwit population is not significantly disturbed.	
		Predation	Reduce the predation of and disturbance to breeding Black-tailed godwit caused by native and non-native predators.	As per garganey (breeding) As part of the 'Project Godwit', electric fencing was installed into areas of the Nene Washes favoured by the godwits in 2017, to attempt to exclude ground based predators and increase breeding success.
		Landform	Maintain an abundance of sufficiently wet ditch/drain edges, scrapes and pools of shallow edge gradient (ideally a gradient of 1:10) and the availability of shallow water over the site as a whole (optimal profiles on >75% of waterbodies by area).	The physical topography and landform of a site will strongly influence the quality and extent of supporting habitats used by this feature for nesting/rearing, feeding and/or roosting as appropriate. This will also influence the interactions with underlying supporting processes on which the supporting habitat may rely. Any changes or modifications to site topography may adversely affect the ability of the supporting habitats to support and sustain this feature.
		Landscape	Maintain the area of open and unobstructed terrain within and around nesting, roosting and feeding sites, and no overall reduction in field size.	As per Bewick's swan
		Vegetation characteristics	Maintain the mix or heights of vegetation types within nesting areas. The sward is managed to a height of approximately 5 cm or less on the 1st April, with occasional longer tussocks.	The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting this feature which enable successful nesting/ rearing/ concealment/ roosting. Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature. Sward height is managed through grazing the previous summer and through winter grazing of wildfowl. Cattle grazing usually doesn't occur at all until the middle of May.

Table 6 Characteristics, vulnerabilities and conservation objectives of Nene Washes SAC site features

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
Nene Washes SAC	Spined loach	Juvenile densities	Maintain a good density of juvenile spined loach throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations; at least 50% of the population should be no more than one year old.	Impacts on physical, chemical or hydrological integrity, or from non-native species, may suppress juvenile densities.
		Population abundance	Maintain the abundance of the Spined loach population at a density which is consistently greater than 0.1 individuals/m <sup>2</sup> (allowing for natural fluctuations), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. At least three year-classes should be present at significant densities.	<p>This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK. Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period. The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration. Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account in any assessment.</p> <p>Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean</p>

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				<p>counts or breeding surveys. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection. Whilst we will endeavour to keep these values as up to date as possible, local Natural England staff can advise that the figures stated are the best available.</p> <p>The target for spined loach on the Nene Washes is set at no reduction in densities from existing levels, and in any case no less than 0.1 m<sup>-2</sup>. The APEM survey in 2015 recorded population densities of 0.52 m<sup>-2</sup> in Morton's Leam.</p>
		Distribution of supporting habitats	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site.	A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.
		Extent of supporting habitats	Maintain the total extent of the habitat(s) which support the feature at 17 km, approximately 88 hectares of standing open water and canals (ditch system).	<p>In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this SAC.</p> <p>The supporting habitat for the SAC feature comprises standing open water and canals (ditch system). The designated SAC is Moreton's Leam, a large, slow moving drain. Field drains within the Nene Washes, outside the SAC <u>but</u> within the SSSI and SPA, probably support a low density of spined loach.</p>
		Biological connectivity	Maintain the free movement of spined loach within supporting habitats.	<p>Even weirs with small vertical drops will prevent re-colonisation of upper reaches affected by lethal pollution episodes or drought, and more generally will also lead to constraints on genetic interactions that may have adverse consequences.</p> <p>Free movement within the channels is necessary to ensure maintenance of genetic diversity (and therefore population viability). New artificial constraints to movement should be</p>



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				avoided and existing barriers should be removed wherever possible
		Flow regime	Maintain a flow regime that is characteristic of the river; as a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year.	The natural flow regime is critical to all aspects of the spined loach life cycle, maintaining the biotope mosaic that is optimal for the species.
		Integrity of off-site habitats	Maintain any supporting habitats present beyond the site boundary upon which the SAC population of spined loach may depend.	Spined loach populations within the SAC may be dependent on the integrity of sections of river channel and riparian areas that lie outside of the site boundary. Headwater areas and tributaries may not fall within the site boundary, yet spined loach may use these areas for spawning and juvenile development and be critical for sustaining populations within the site.  Spined loach have been found in field drains within the Nene Washes SSSI.
		Invasive non-native species	Ensure non-native species categorised as 'high-impact' in the UK under the Water Framework Directive are either rare or absent but if present, the mean cover of each very aggressive non-native plant should not exceed 1% and mean total combined cover of all non-native species and introduced species should not exceed 30%.	Non-native plant invasions may result in gross distortions to aquatic plant communities. The very aggressive <i>Azolla</i> spp., <i>Crassula helmsii</i> and <i>Hydrocotyle ranunculoides</i> can blanket sections of ditch and out-compete native species, resulting in a significant loss in diversity. <i>Myriophyllum aquaticum</i> may also have this potential in ditches. A more stringent target may be necessary on large ditch systems. Native plants are able to co-exist somewhat more easily with other non-native species, such as <i>Acorus calamus</i> , <i>Elodea</i> spp. and <i>Lagarosiphon major</i> . The non-native <i>Lemna inuta</i> is not included in this assessment unless it is found to be dominant, because it is very difficult to distinguish from <i>Lemna minor</i> . Where invasive native plants with a restricted natural distribution in the UK (e.g. <i>Stratiotes aloides</i> and <i>Nymphoides peltata</i> ) are introduced to a site outside their natural range, these species should be treated as 'non-native'.  Species such as signal crayfish may have a serious effect on spined loach habitat (by destabilising banks and enhancing very fine sediment input) and may predate heavily on spined loach if present at high densities. Chinese mitten crab has the potential to migrate long distances up rivers and may cause similar damage to spined loach habitat.  Chinese mitten crabs are known to inhabit Moreton's Leam, but have so far not been found to be causing a detrimental impact.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				Populations of invasive non-native species should be monitored, and controlled if there is any evidence for effects on spined loach populations
		Riparian zone	Maintain vegetation management to no more than 50% of the channel width (for submerged plants) and 50% of the bank length (for marginal fringing plants).	Active marginal vegetation including riparian trees provides important cover for spined loach. A mosaic of vegetation types and sward heights provides suitable conditions for the whole characteristic biological community including spined loach.  Riparian trees are not deemed acceptable along the banks of Moreton's Leam. This is partly because of the requirements of the breeding waders that the Nene Washes SPA supports, and partly for the most efficient functioning of Moreton's Leam as a drainage channel.
		Screening of intake and discharges	Ensure any intakes and discharges likely to trap a significant number of spined loach are being adequately screened.	Spined loach can be entrained in intakes and discharges along with other fish species.
		Sediment regime	Maintain substrate character at no more than 40% silt.	Excessive delivery of very fine sediment, from the catchment or artificially enhanced bank erosion, can produce sub-optimal feeding conditions for spined loach and can interfere with submerged plant communities on which the species relies for cover and spawning.  Periodic desilting is necessary in Moreton's Leam to maintain suitable substrate for spined loach, because there is insufficient flow to mobilise sediment.
		Fisheries - introduction of fish species	Ensure fish stocking/introductions do not interfere with the ability of the SAC to support self-sustaining populations of spined loach.	The presence of artificially high densities of fish can create unacceptably high levels of predatory pressure on spined loach. Stocking with fish carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population.
		Cover of submerged macrophytes	Maintain a sufficient proportion of submerged aquatic macrophytes to allow them to reproduce in suitable habitat and unaffected by river management practices.	Submerged and marginal vegetation provides vital cover for spined loach. Submerged plants are used for egg-laying.  For ditch sites, cutting operations should leave sufficient vegetation to maintain cover and spawning substrate. Rotational cutting regimes to maintain ditch habitat should be adequate for the species.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
				Maintain grazing activity in the riparian zone and in the river channel at suitably low levels.
		Adaptation and resilience	Maintain the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site.	<p>This recognises the increasing likelihood of supporting habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site.</p> <p>The overall vulnerability of this SAC to climate change has been assessed by Natural England as being high.</p> <p>The Nene Washes is a designated flood storage reservoir and is often subject to deep winter floods which don't appear to impact spined loach. Water levels are generally maintained in summer, and even if low they are unlikely to be a problem to a bottom-dwelling fish.</p> <p>The low-lying nature of the Nene Washes SAC and its connection to the sea via tidal rivers means it is increasingly vulnerable to the effects of sea-level rise, exacerbated by land shrinkage through peat oxidation; in future the intrusion of increasingly saline water may have an impact on the spined loach feature. The River Nene becomes tidal at the Dog in a Doublet Sluice.</p>
		Air quality	Maintain or, where necessary, restore concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.	<p>The supporting habitat of this feature is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature.</p> <p>Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p>
		Conservation measures	Maintain the management measures (either within and/or outside the site boundary as	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site.

Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
			appropriate) which are necessary to maintain the structure, functions and supporting processes associated with Spined Loach and/or its supporting habitats.	
		Water quality/quantity	Restore water quality and quantity to the following standards which provides the necessary conditions to support the feature.	<p>Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature.</p> <p>Recent water quality data shows that water quality in Moreton's Leam is marginally within the acceptable limits. There are concerns over the amount of summer abstraction that might affect water levels in Moreton's Leam, but levels are extremely unlikely to become low enough to affect a bottom dwelling fish.</p> <p>Dissolved oxygen levels can become low during winter floods or during periods of low summer flows. There is little information about the way that low dissolved oxygen levels affect spined loach.</p>

Table D-27 Characteristics, vulnerabilities and conservation objectives of Nene Washes Ramsar site features

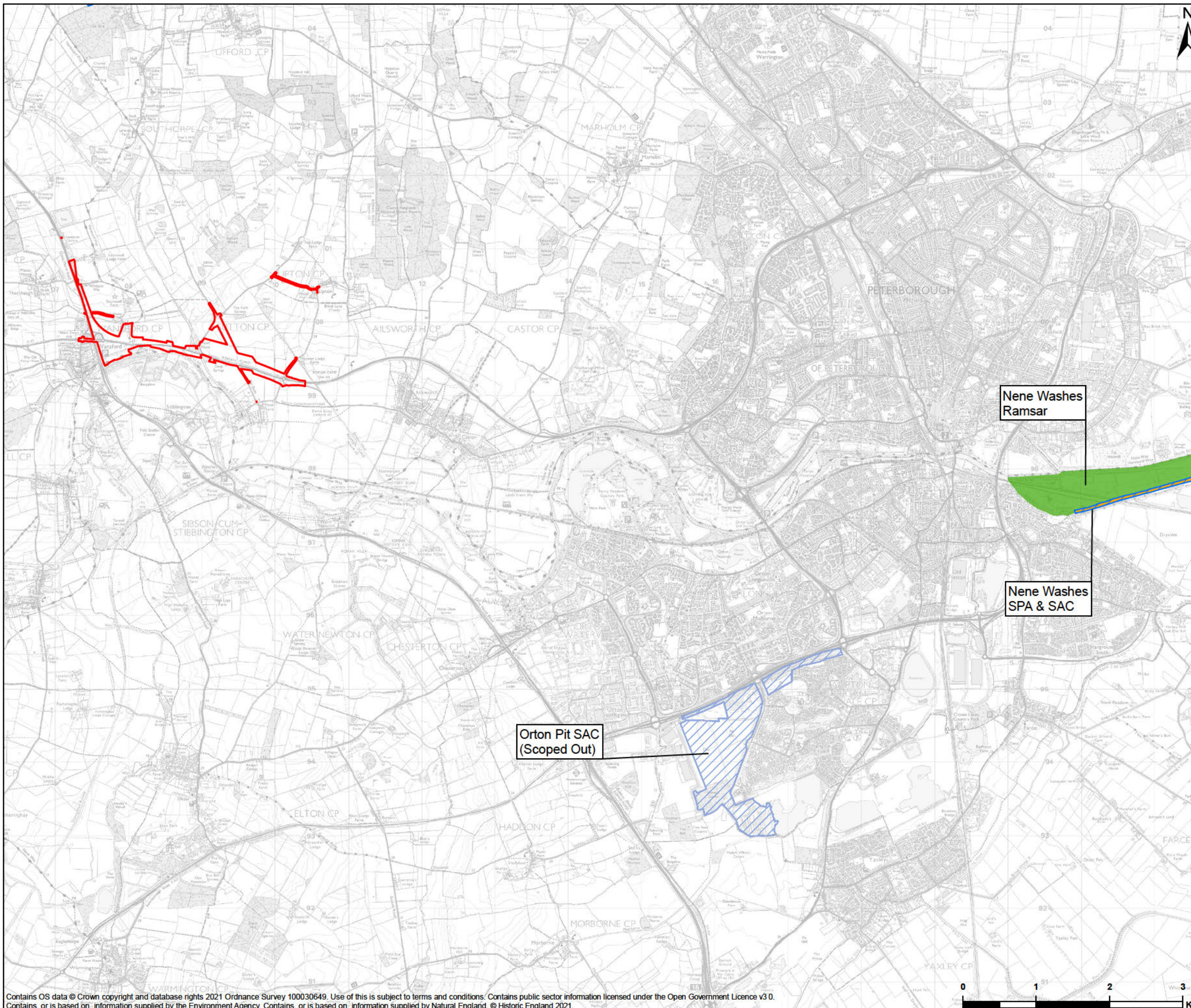
Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
Nene Washes Ramsar	<b>Ramsar criteria 2</b> - The site supports an important assemblage of nationally rare breeding birds. In addition, a wide range of raptors occur through the year. The site also supports several nationally scarce plants, and two vulnerable and two rare British Red Data Book invertebrate species have been recorded	<p>There are no outlined vulnerabilities or conservation objectives outlined within the most updated Nene Washes Ramsar Information Sheet (RIS). The most up to date document for this site is 5 March 1993.</p> <p>As the Ramsar citation includes all the species which are cited in both the SPA and SAC designation, for this purpose of this HRA the conservation objectives and site vulnerabilities are considered the same as those outlined above.</p>		
	<p>Ramsar criteria 6 – Species/populations occurring at levels of international importance:</p> <p>Bewick's swan - 694 individuals, representing an average of 2.3% of the population (5 year peak mean 1998/9 - 2002/3)</p>			



Site Name	Interest Feature	Vulnerability	Target	Conservation Objective
	<p>Species/populations identified subsequent to designation for possible future consideration under criterion 6;</p> <ul style="list-style-type: none"> <li>- Black-tailed godwit</li> <li>- Pintail</li> </ul>			

## Appendix E. Designated sites map





LEGEND

- Proposed Scheme Design
- Proposed DCO Boundary
- Spatial Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar Site

REFERENCE MAP

PO1	12/02/2021	FIRST EDITION	RM	IC	MM
REV	DATE	REVISION NOTE	ORG	CHK D	APP'D

DESIGNER

**SWECO**

CONTRACTOR

**GallifordTry**

CLIENT

**highways  
england**

PROJECT TITLE

**A47 WANSFORD TO SUTTON**

PROJECT STAGE

**PCF STAGE 5**

DRAWING TITLE

**HRA REPORT  
APPENDIX E - DESIGNATED  
SITES TR010039/APP6.10**

SUITABILITY

**FOR INFORMATION**

SHEET SIZE	A3	SCALE	1:50,000	STATUS	S2
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DRAWING NUMBER

**HE551494-GTY-EBD-000-DR-GI-30001**

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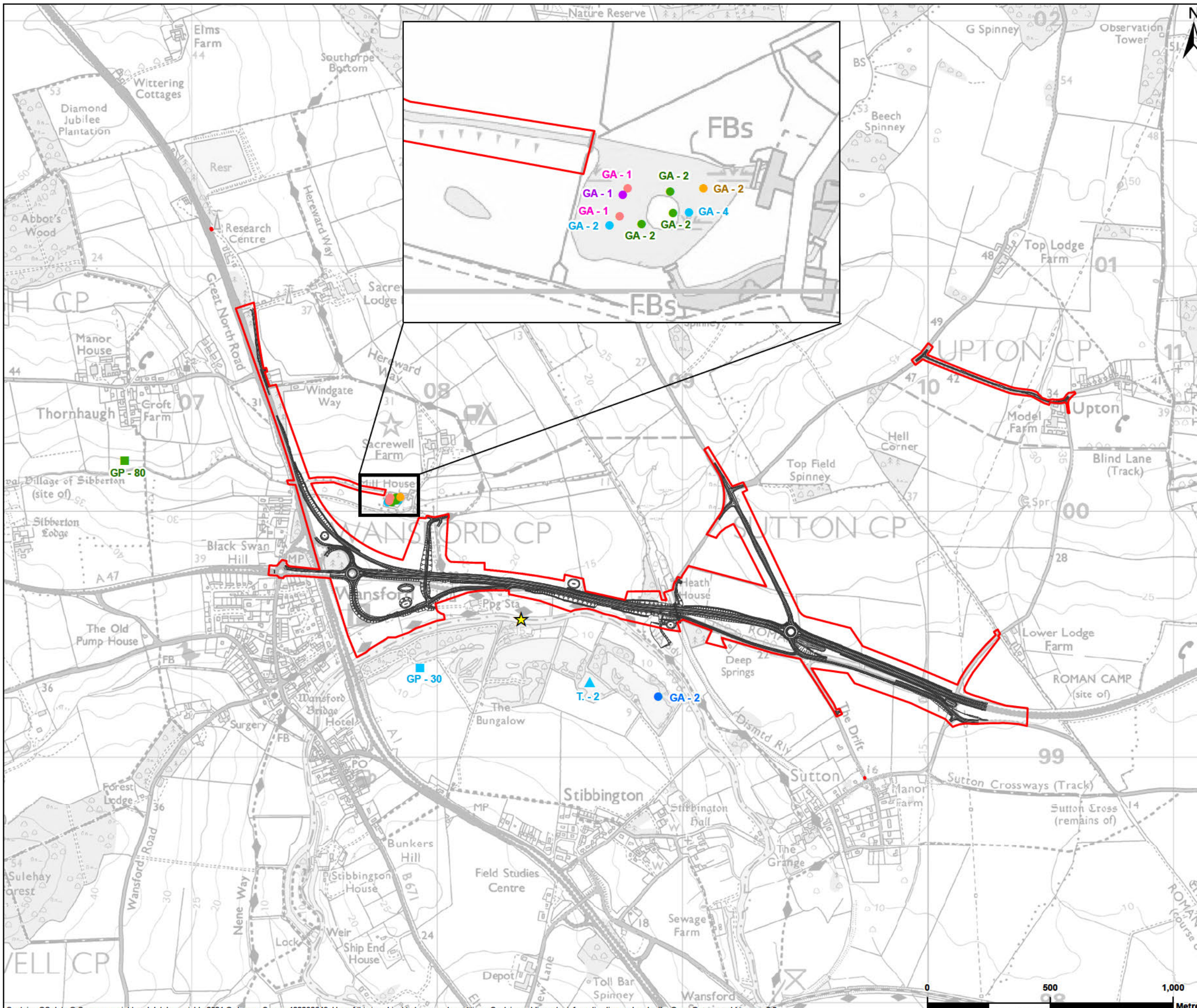
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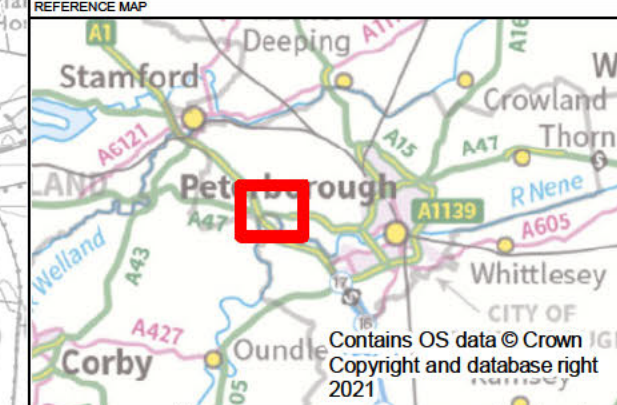





## Appendix F. Map of NSN qualifying features





- LEGEND**
- Proposed Scheme Design
  - Proposed DCO Boundary
  - Spined Loach Sighting (2017)
  - Wintering Birds Survey - January
    - Gadwall (GA) - Sighting
    - Golden Plover (GP) - Sighting
    - Teal (T.) - Sighting
  - Wintering Birds Survey - February
    - Gadwall (GA) - Sighting
  - Wintering Birds Survey - March
    - Gadwall (GA) - Sighting
    - Golden Plover (GP) - Sighting
  - Breeding Birds Survey - April
    - Gadwall (GA) - Sighting
  - Breeding Birds Survey - May
    - Gadwall (GA) - Sighting
  - Breeding Birds Survey - June
    - Gadwall (GA) - Sighting



P01	12/02/2021	FIRST EDITION	RMT	C	MM
REV	DATE	REVISION NOTE	ORG	CHK D	APP
DESIGNER					
<div>SWECO</div> 					
CONTRACTOR					
					
CLIENT					
					
PROJECT TITLE					
A47 WANSFORD TO SUTTON					
PROJECT STAGE					
PCF STAGE 5					
DRAWING TITLE					
HRA REPORT APPENDIX F - MAP OF NSN QUALIFYING FEATURES (TR010039/APP6.10)					
SUITABILITY					
FOR INFORMATION					
SHEET SIZE		SCALE		STATUS	
A3		1:15,000		S2	
DRAWING NUMBER					
HE551494-GTY-EBD-000-DR-GI-30002					

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## Appendix G. Consultation response from Natural England

Date: 10 June 2021  
Our ref: DAS/13524/343666



Cassandra Steiger  
Assistant Project Manager  
Regional Investment Programme (East)  
Highways England

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Cheshire  
CW1 6GJ

**BY EMAIL ONLY**

0300 060 3900

Dear Ms Steiger

**Discretionary Advice Service (Charged Advice)**

**DAS/343666/354532**

**Development proposal and location: A47 Wansford to Sutton Dualling Scheme, Cambridgeshire**

Thank you for submitting your request for Natural England advice on the above scheme through submission of your Discretionary Advice Service (DAS) request form received on 26 May 2021. We apologise for the delay in providing a formal response whilst we have been dealing with workload pressures.

This advice is being provided as part of Natural England's Discretionary Advice Service (DAS) and in accordance with the Quotation and Agreement dated 08 June 2021.

Through this agreement, Highways England has requested Natural England's advice on the Report to Inform Habitats Regulations Assessment (HRA) for the A47 Wansford to Sutton Dualling Scheme.

The A47 Wansford to Sutton Dualling Scheme is intended to provide a new 2.5km dual carriageway between the A1/A47 Wansford junction and Nene Way roundabout, as well as a free-flow link road from the A1 southbound to the A47 eastbound with the objective to alleviate congestion at the Wansford junctions. The scheme is being delivered by Highways England and includes new link roads, slip roads and junctions, relocating of the A47 Sutton roundabout, improvements to Upton Drift, and a new walking and cycling route connecting Wansford to Sutton.

This advice follows on from the advice provided in our previous letters dated 07 March 2018 (ref: 238670) and 12 November 2018 (ref: 259173). Please note that our advice in this letter is based primarily on our review of the Report to Inform HRA.

**Natural England's advice**

Assessment methodology

Natural England has reviewed the Report to Inform HRA and finds that the approach to the assessment generally accords with the requirements of the Conservation of Habitats and Species Regulations 2017. In particular, we welcome the consideration of potential effects through application of the precautionary principle. However, as the potential in-combination impacts are still

being assessed, we would expect these to be included within a revised HRA and further consultation to take place.

Also, Natural England is currently not satisfied that all relevant European sites have been scoped into the assessment with reference to potential pathways for impact on the qualifying features and conservation objectives of these sites. We understand that one of the criteria for inclusion in the screening assessment requires the development to cross or lie adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a European site. Therefore, we would welcome further clarification on the justification for screening out Rutland Water Special Protection Area (SPA) and Ramsar, and Orton Pit Special Area of Conservation (SAC).

#### Stage 1 screening

We welcome the consideration of the sensitivities and vulnerabilities of the Nene Washes SPA, SAC and Ramsar presented in Tables A-1, A-2, and A-3 respectively, with reference to potential effect pathways of the scheme.

We note that the Nene Washes SPA, SAC and Ramsar is located around 16km downstream, and is therefore hydrologically linked to the scheme. Construction activities are planned within 8m of the River Nene and the possible negative effects of water pollution through spillages of fuel and chemicals have been identified. The report states that during construction, standard best practice methods for pollution prevention and water management will be used. We would welcome further information on the detail of the mitigation measures in place to prevent water pollution from spillages, as well as for another potential source of pollution, the extraction of soils near to the river. In addition, we note that the scheme will utilise the existing drainage network where applicable and therefore will not be upgrading the road drainage for the existing carriageway. We previously stated concerns in our previous letter dated 12 November 2018 over these plans, as surface water could potentially enter the River Nene without going through receptors.

We note the wintering and breeding bird surveys undertaken which have identified the site's ecological value for wintering and breeding birds of the Nene Washes SPA and Ramsar. We also welcome the proposed daytime working hours for construction activities, which will limit noise and light disturbance to the qualifying features of the Nene Washes SPA, SAC and Ramsar. However, the results are from only one winter and one breeding season and therefore we consider the surveys to be suboptimal. We would welcome further information through the winter birds report to confirm, with reference to desk records from relevant sources including Cambridgeshire and Peterborough Environmental Records Centre (CPERC), RSPB and Wildfowl and Wetlands Trust (WWT), that the site and surrounding land is not regularly used by Nene Washes SPA and Ramsar birds, particularly whooper swans, and is therefore not functionally linked. If records indicate that the site and/or surrounding areas may be functionally linked, or indicate its importance to other bird species, then bird disturbance and displacement effects should be assessed and appropriate mitigation to address any adverse impacts identified.

We note that the traffic volume of the scheme is anticipated to increase over its lifetime, but the change in air quality within the Nene Washes SPA, SAC and Ramsar is anticipated to be negligible to minor. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on air quality. The receptors identified in Tables B-1 and B-2 have not been modelled for in-combination effects and therefore no likely significant effects cannot be ruled out.



## Conclusions

Based on distance, and factoring in the effects of attenuation and the requirement for regulatory compliance to protect the water environment, we agree that it is unlikely that the proposed scheme will have a significant effect on the Nene Washes SPA, SAC and Ramsar alone. However, further information is required to support this conclusion and the potential in-combination impacts with other relevant projects within 2km are still to be screened within the HRA.

Natural England's advice is that the revised HRA and its conclusions should seek to address our advice and requests for further information set out above.

We will be pleased to provide advice on the updated HRA through the existing Discretionary Advice Service (DAS), as well as on the ecological mitigation plan and Landscape Visual Impact Assessment as stated in request form.

This letter concludes Natural England's Advice, as requested in your email of 15 February 2021 and within the Quotation and Agreement dated 08 June 2021. For clarification of any points in this letter, please contact Ryan Rees on 07425 617458.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

Ryan Rees  
Lead Adviser – Sustainable Development

cc. [commercialservices@naturalengland.org.uk](mailto:commercialservices@naturalengland.org.uk)

## **Appendix H. Consultation response to Natural England**

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**PRIVATE AND CONFIDENTIAL**

21/06/2021

Project Name: A47 Wansford to Sutton Dualling Scheme, Cambridgeshire

Project Reference: HE551494

Document Reference: HE551494-GTY-EBD-000-CO-LB-00001

**Response to DAS/13524/343666**

Dear Mr Rees,

Thank you for your response to our Habitats Regulations Assessment (HRA) regarding the above scheme on 10<sup>th</sup> June 2021.

In response to your queries:

1. *"As the potential in-combination impacts are still being assessed, we would expect these to be included within the revised HRA and further consolation to take place".*

Please find attached the updated HRA which includes a full assessment of in-combination impacts associated to the proposed scheme. Some additional updates regarding the proposed scheme are also included.

2. *"Natural England is currently not satisfied that all relevant European sites have been scoped into the assessment with reference to potential pathways for impact on the qualifying features and conservation objectives of these sites.....Therefore, we would welcome further clarification on the justification for screening out Rutland Water Special Protection Area (SPA) and Ramsar, and Orton Pit Special Area of Conservation (SAC)".*

The methodology outlined in the HRA sets out five criteria which outline the rational for the selection of NSN sites to be assessed (section 2.2.8). Both Rutland Water SPA and Orton Pits SAC were assessed for potential inclusion on this criteria.

Rutland Water SPA is designated for its wintering populations of gadwall and shoveler and wintering assemblages of more than 20,000 waterbirds. When assessing potential NSN sites based on the five criteria outlined in the methodology, Rutland Water SPA did not meet any of the criteria required to be assessed as part of the HRA. The SPA is over 14km NW of the proposed scheme, it is not hydrologically linked either upstream or downstream from the proposed works, is not linked as a groundwater dependent ecosystem and is not impacted by the active road network.

Consideration was made on whether the species which make up the SPA would rely on the habitats within the proposed scheme for foraging or roosting. Given the small areas of wetland habitat across the scheme it was considered unlikely, however further analysis of baseline wintering bird survey (undertaken October 2017 – Feb 2018) data was undertaken.

This analysis showed a peak count of 21 gadwall and no shoveler. The species listed as part of the 'assemblage' on the SPA citation that were recorded during the wintering bird survey include tufted duck, mute swan and coot. Compared to the original 1991 SPA citation, peak counts for these species were assessed against the results from the wintering bird survey of 2017/18 to understand the total % of the cited population:

<i>Species</i>	<i>SPA Citation Count</i>	<i>Wintering bird survey count (2017/18)</i>	<i>% of SPA population</i>
<i>Tufted Duck</i>	3,230	1	0.03%
<i>Mute Swan</i>	200	9	4.5%
<i>Coot</i>	4,600	5	0.1%
<i>Gadwall</i>	1,320	12	0.9%

Given the small percentage of tufted duck and coot, it was immediately discounted that these individuals are part of the Rutland Water SPA population given the distance to the SPA presence of these species in the wider landscape.

Further assessment was undertaken for mute swan and gadwall to obtain additional information on whether these birds are linked to the SPA.

The peak wintering bird count of mute swan was nine during the baseline wintering bird survey 2017/18. Further research produced evidence that a pair of mute swan nest annually on the Mill Pond within Sacrewell Farm. This was supported from breeding bird data during 2018 and 2020. Therefore, it was considered that the majority of all the mute swans recorded on the scheme would be associated to this family group and other more localised nest sites. Other first winter birds are likely utilising the River Nene CWS and Stibbington Pits CWS as they move away from their natal grounds during the winter months. It was therefore concluded that the population of mute swans recorded within the site do not make up any of the population which use the Rutland Water SPA.



The peak wintering count for gadwall was 12 during the baseline wintering bird survey. These birds were recorded on Stibbington Pits CWS (December 2017) and Mill Pond at Sacrewell Farm (March 2018). Breeding bird surveys during 2018 and 2020 indicated that gadwall breed at Sacrewell Farm and therefore it is assumed that the majority of the wintering population within the study area around the proposed scheme, are residents of the area and are not linked to the SPA site.

As Rutland Water SPA did not meet any of the five criteria outlined in the methodology and the birds present on site are unlikely to constitute part of the population in which the SPA is cited, it was concluded that birds from the SPA do not rely on habitat within the proposed scheme. Therefore, Rutland Water SPA and its features was scoped out from further assessment.

It was considered that Orton Pits SAC could be scoped out of the assessment as it fails to meet any of the five criteria outlined in the methodology. Orton Pits SAC is over 7km SW of the Wansford and there is no hydrological linkage from the proposed scheme to the SAC. When considering the site as 'functionally linked', the surrounding habitat was assessed as to whether it was linked without barriers. We concluded that as the SAC is south of Peterborough and is also south of both the A1 and a major ring road around Peterborough (A1139) these provide substantial barriers in the northern movement of great crested newt. If newts were to get past the major roads and urban barriers north of the site, newts would then also need to cross the River Nene to reach the proposed site. We concluded that the likelihood of great crested newts from Orton Pits SAC utilising the scheme is highly unlikely and due to the various barriers between the SAC and the proposed works it cannot be considered 'functionally linked'. Based on the assessments outlined above, Orton Pits SAC was scoped out for further assessment.

3. *"The report states that during construction, standard best practice methods for pollution prevention and water management will be used. We would welcome further information on the detail of the mitigation measures in place to prevent water pollution from spillages, as well as for another potential source of pollution, the extraction of soils near to the river".*

Standard best practice construction measures are outlined in more detail in the Environmental Statement, *Chapter 13, Road drainage and the water environment* and will be written into the Environmental Management Plan at PCF Stage 5, *Appendix B8 Drainage Management Plan*. Standard best practice mitigation which is to be included in the EMP are:

- Appropriate storage of construction materials, including bunding of storage tanks, use of silt fencing and covering stockpiles.

- Spill kits should be located on sites near to ordinary watercourses and within the works compounds and staff should be trained in their use.
  - Emergency response procedures to handle any leakages or spillages of potentially contaminating substances.
  - In areas where there is an increased risk of hydrocarbon or chemical spillages and around hazardous substance stores, additional precautions such as bunding of containers and delivery systems will be taken.
  - Stockpiled materials will be stored in enclosed areas to ensure that run-off can be appropriately stored and treated. Storage areas will be at least 12m from any watercourse to minimise potential pollution risks associated with run-off to watercourses (including silting).
  - Concrete work will be carefully controlled. Where required, concrete tankers will be washed out in controlled areas.
  - All plant and machinery will be maintained in good condition and, where required, maintenance will be undertaken within controlled areas.
  - An incident control plan will be prepared, which will include pollution prevention and spill response procedures. Spill kits and clean-up equipment will be maintained on site.
  - Wheel washers and dust suppression measures will be used to prevent the migration of pollutants
  - Monitoring of surface watercourses and groundwater will be carried out before, during and after construction to ensure no adverse impact on water quality.
  - Throughout construction methods to control water pollution include use of road sweepers to keep construction areas tidy, vehicle wash, spill kit controls, specialist booms for slewing across any watercourses, silt fencing, silt socks, installation of straw bales or sandbags, drain mats and earth bunds.
4. *“We note that the scheme will utilise the existing drainage network where applicable and therefore will not be upgrading the road drainage for the existing carriageway. We previously stated concerns in our previous letter dated 12 November 2018 over these plans, as surface water could potentially enter the River Nene without going through receptors”.*

The proposed drainage system consists of a combination of new and existing highway drainage assets and incorporates sustainable drainage (SuDS) measures where possible in the form of vegetated attenuation and infiltration basins. The surface water runoff will be collected using either trapped gullies or combined kerb drains. Collected surface water runoff will be conveyed using filter drains (perforated carrier drains within granular filter media) and roadside ditches in most locations, and standard carrier drains will be used at other locations. As outlined in the Environmental Statement Chapter 8 Biodiversity, Catchpit

chambers would collect any remaining sediment which has not been collected in the planted attenuation basins before it discharges into the River Nene at the headwalls.

5. *“The results are from only one winter and one breeding season and therefore we consider the surveys to be suboptimal. We would welcome further information through the winter birds report to confirm, with reference to desk records from relevant sources including Cambridgeshire and Peterborough Environmental Records Centre (CPERC), RSPB and Wildfowl and Wetlands Trust (WWT), that the site and surrounding land is not regularly used by Nene Washes SPA and Ramsar birds, particularly whooper swans, and is therefore not functionally linked”.*

The conclusions of the HRA are drawn from two wintering bird surveys and two breeding bird surveys which totals 16 site visits (minimum). As outlined in section 3.4.6 and 3.4.9 the first wintering bird survey was October 2017 - March 2018 and a second survey January - March 2020 (Appendix 8.10 of the ES). The first breeding survey in April – June 2018 and the second survey March - June 2020 (Appendix 8.8 of the ES).

Within the wintering bird report 2018, a desk study was undertaken using data obtained from The Cambridgeshire Bird Atlas which held data from survey carried out between 1999 and 2007. Those species which have been cited on the Nene Washes SPA and Ramsar and identified in the data search include, gadwall and shoveler. No Ramsar qualifying species were received.

The wintering and breeding bird report undertaken in 2020 included a desk study with information received from Cambridgeshire and Peterborough Environmental Records Centre, Northamptonshire Biodiversity Records Centre and National Biodiversity Network Atlas. From this desk study, SPA and Ramsar species identified include gadwall (SPA) and teal (SPA and Ramsar).

The wintering bird survey 2018 found two species which are Nene Washes SPA and Ramsar qualifying species (teal and gadwall). The same two species were also recorded on the wintering bird survey 2020 with the peak count of two teal (recorded only in January) and six gadwall (recorded in January and March).

The breeding bird survey 2018 identified one species cited as part of the Nene Washes SPA (teal). The breeding bird survey in 2020 recorded one SPA qualifying species, gadwall, (found in pairs on three occasions), and one Ramsar qualifying species, golden plover (single flock of 80 individuals flying over north during March).

Based on the information above, through desk studies from multiple resource centres and four field surveys, it was concluded that the site is not relied upon by species cited as part of the Nene Washes SPA and Ramsar.

- Gadwall which were present during the wintering bird seasons, continued to remain present throughout the summer and breed. They are therefore considered resident to the area.
- Golden plover were recorded flying over the scheme in March which would indicate active northern migration.
- Teal were recorded on one occasion (January 2020) consisting of two individuals.
- Shoveler were identified through the 2018 desk study however no other records were returned during additional desk studies or during any of the four field surveys (>16 visits). This is likely due to a lack of suitable habitat for this species across the scheme.
- No desk records or field sightings of Whooper or Bewick's Swan.

It can therefore be concluded that the proposed site is not functionally linked to the Nene Washes.

6. *"The receptors identified in Tables B-1 and B-2 have not been modelled for in-combination effects and therefore no likely significant effects cannot be ruled out".*

The receptors identified in Table B1 and B2 were included as a 'proxy' in relation to nitrogen deposition on Nene Washes SAC, SPA and Ramsar and therefore not required to be part of the in-combination effects. The premise of using these sites were to help illustrate that given sites within close proximity to the proposed scheme are not affected by nitrogen deposition, a European site 10km away is even less likely to be.

All sites were modelled based upon critical loads whereby an increase in more than 1% is considered an impact. As three of the four sites came back with a score less than 1% of the lower critical load (Thorpe Wood 0.84%, Sibson Flood Meadow 0.21%, Roadside Nature Reserve -2.80%) it can be concluded based on DMRB standards LA105 Air Quality, no likely significant effect is present.

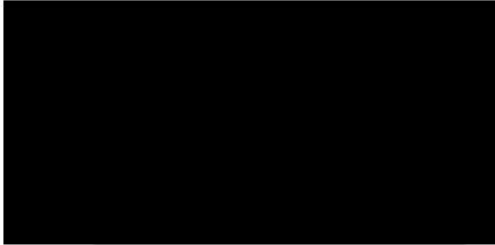
Sutton Heath and Bog SSSI was modelled and returned an increase of more than 1% of the critical load however, the air quality modelling demonstrates that the impact zone is only 40m from the proposed scheme. This supports the assertion that if an impact zone is only 40m from the proposed scheme, a site 10km away is also not going to be negatively impacted by nitrogen deposition.

We hope the above answers all your points and clarifies our position as to why we consider the proposed scheme will have no likely significant impact on the Nene Washes SAC, SPA and Ramsar. Furthermore, we hope this helps add clarity on why sites were chosen, the various supporting data which has enabled us to make the assessment, and supplies further details on best practice mitigation and air quality impacts.

We hope that this further information helps support our conclusion and you remain in agreement with our finding of No Likely Significant Effect.



Yours sincerely



**Mike Youdale**  
Principal Ecologist

