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AWS DRAFT DROUGHT PLAN 2027 – HRA

Habitat Regulations Assessment (HRA) Screening and Information to Inform an Appropriate Assessment (IIAA)

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1. INTRODUCTION

1.1 BACKGROUND

Water companies in England and Wales are required to prepare and maintain Statutory Drought Plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 (and subsequently the Water Act 2014), which set out the short-term operational steps a company will take before, during and after a drought. The Water Industry Act 1991 defines a Drought Plan as 'a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits'.

Anglian Water Services Ltd (AWS) published their current Statutory Drought Plan in April 2022 which encompasses the period 2022-2027. Drought Plans are updated every five years to remain relevant and align with updated guidance. As a result, AWS are now in the process of revising their statutory Drought Plan for the period 2027-2032. The Drought Plan (England) Direction 2025 (which came into force on 23rd July 2025) sets out the timescales for publication of the Drought Plans, stating that a water undertaker must submit a draft Drought Plan to the Secretary of State before, or on 31st March 2026.

The Drought Plan provides a comprehensive statement of the actions AWS will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact. Drought Plans encompass a number of drought actions that will only be implemented if and when required. Each drought is different in terms of its severity, season, location and duration and each combination of these factors may require a bespoke reaction in terms of measures. In the context of drought planning, individual drought actions are taken to constitute alternatives.

1.2 NEED FOR HRA

The requirement for a HRA is established through Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora, hereby referred to as the 'Habitats Directive', in Articles 6(3) and 6(4). The Habitats Directive is transposed into national legislation by the Conservation of Habitats and Species Regulations 2017 (as amended)[1] commonly referred to as the Habitats Regulations. The responsibility for undertaking the HRA lies with AWS as the Plan making authority.

Regulations 63 transposed the provisions of Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') as they related to plans or projects in England and Wales. Under Regulation 63, any plan or project which is likely to have a significant effect on a Habitats Site (either alone or in-combination with other plans or projects) and is not directly connected with, or necessary for the management of the site, must be subject to a HRA to determine the implications for the site in view of its conservation objectives.

The responsibility for undertaking the HRA lies with AWS as the Plan making authority (competent authority). The Environment Agency is the competent authority for approving drought permit applications. The Secretary of State is the competent authority for approving drought orders. This report is an informal HRA and provides sufficient information for the competent authority to make the Appropriate Assessment of the Drought Plan.

1.3 CONSULTATION

The Statutory Nature Conservation Body (SNCB) for the Plan is Natural England.

The purpose of these studies, as well as informing any future assessment process and providing a generic template, is to allow a more considered consultation process and to encompass consultees' concerns in a timely manner, avoiding the time constraints necessary for an actual drought permit/order application.

The Drought Plan Guideline 2025 (DPG25)[2] requires water companies to discuss the environmental assessments, mitigation measures and monitoring plans as early as possible with the SNCB when developing a Drought Plan. This should be part of the preliminary discussions held with regulators, other organisations and individuals who could be affected by drought management actions.

[1] The Conservation of Habitats and Species Regulations 2017

[2] Water Company Drought Plan Guideline, March 2025.

The DPG25 requires Natural England to be engaged where a plan is likely to affect protected sites (e.g. National Site Network sites and SSSIs) in England. The DPG also requires a water company to contact the relevant National Park Authority (including the Broads Authority) about any actions that will take place within their boundaries and relevant local authorities in relation to Local Wildlife Sites.

To ensure the stakeholder and regulatory engagement requirements were met, AWS actively engaged with regulators and other stakeholders during the preparation of the DP27 environmental assessments. The engagement plan is listed below in **Table** 1-1: and is supplemented by feedback previously received from the Environment Agency, Natural England and Historic England on the DP22 environmental assessments.

Further consultation with key stakeholders will be undertaken throughout the Drought Plan consultation process and during any drought permit applications. Drought Plan consultation on this draft HRA will be undertaken between **11 May 2026** and **17 July 2026**. Please send consultation responses to Defra (water.resources@defra.gov.uk) adding Anglian Water into the email subject field. Please also copy in Anglian Water's drought mailbox (drought@anglianwater.co.uk).

Table 1-1: Stakeholder / regulatory engagement

Date	Stakeholder	Issues raised	Action/outcome
20th November 2024	Environment Agency and Natural England	Initiation of discussions with statutory consultees.	Aim of the HRA.
7th January 2025	Environment Agency, Natural England and Historic England	Discussion on EAR methodology.	Comments incorporated and methodology refined.
22nd January 2025	AWS, Natural England and Environment Agency	Presentation of the HRA methodology and discussions of few points to take into account.	Comments incorporated in this HRA including comment regarding update to the model for the Lower Colne and Wellington, and the consideration of recovery impacts and delayed effects on recovery.
3rd April 2025	Environment Agency	Discussion on groundwater assessment methodology for Wellington Wellfield.	Report refined.
15th April 2025	Environment Agency	Discussion on groundwater assessment methodology for Lower Colne Augmentation.	Report refined.

1.4 STRUCTURE OF THE REPORT

This report is divided into the following sections:

- Section 1: Introduction, to present the purpose of this report.
- Section 2: Provides an overview of the requirement for HRA and ongoing consultations.
- Section 3: Provides the methodology adopted for the Stage 1 Screening and Stage 2 Appropriate Assessment (AA).
- Section 4: Provides an overview of the Drought Options.
- Section 5: Provides the results of the Stage 1 Screening of the Plan.
- Section 6: Provides the Information to Inform the Stage 2 AA.
- Section 7: Provides the results of the In-Combination assessment.
- Section 8: Provides the conclusions of the Stage 1 Screening and Stage 2 AA.

2. METHODOLOGY

2.1 OVERVIEW OF HRA PROCESS

The objectives of the HRA are to establish, firstly, whether options included in DP27 are likely to have a significant effect on a Habitats Site, as defined in the National Planning Policy Framework[3] as "*Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 and also including candidate Special Areas of Conservation or Special Protection Areas, listed or proposed Ramsar sites, 106 relevant Marine Sites, and compensatory habitats which relate to the sites listed above*", (alone or in-combination with other supply schemes in the plan, or with other plans and projects), and secondly, where a significant effect is likely, to determine through AA, whether the plan would adversely affect the integrity of the Habitats Site.

Habitats sites include Special Protection Areas (SPAs) and *Special Areas of Conservation (*SACs), as well as internationally designated Ramsar sites:

- All existing SPAs in the UK were classified under the European Council Directive 'on the conservation of wild birds' (2009/147/EC; Birds Directive)[4] for the protection of wild birds and their habitats (including particularly rare and vulnerable species listed in Annex 1 of the Birds Directive, and migratory species).
- All existing SACs in the UK were designated under the Habitats Directive (92/43/EEC) and target particular habitats (Annex 1) and/or species (Annex II) identified as being of European importance.
- The Government also expects, as a matter of policy, potential SPAs (pSPAs), possible/proposed SACs (pSACs), compensation habitat and Ramsar sites to be included within the assessment.
- Ramsar sites support internationally important wetland habitats and are listed under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, 1971).

For ease of reference throughout the HRA process, these designations will be collectively referred to as "Habitats Site", despite Ramsar designations being made at the international level. However, individually, each Habitats Site will be referred to with their known name using SAC, SPA or Ramsar site terminology.

UK Guidance[5] recognises up to four sequential steps in the HRA process as follows:

- Stage 1 Screening – the identification of Likely Significant Effects (LSE) of each drought option in AWS' DP27 on a Habitats Site either alone or in-combination. The test is a trigger for further assessment, and therefore the bar is set low i.e., is there a risk or possibility of an adverse effect. At this stage mitigation measures should not be taken into account, in accordance with the People over Wind (Court of Justice of the European Union (CJEU) Case C-323/17[6]); this reinforces the idea of screening as a low bar and makes AAs more common. See **Section 4** for screening assessment.
- Stage 2 AA and the integrity test – which involves closer examination of the plan and screened in Habitats Site to determine whether those sites will be subject to Adverse Effects on Integrity (AEoI). The scope of such assessments is not set, and some may not be particularly detailed, especially where standard mitigation measures are available which are known to be effective. The level of assessment must be sufficient to ensure that there is no reasonable scientific doubt that AEoI will not occur. See **Section 5** for AA.
- Stage 3 Feasible Alternative Solutions – as per Regulation 64 of the Habitats Regulations, where significant AEoI or uncertainty remain after the inclusion of mitigation in Stage 2, alternative ways where feasible alternative solutions that meet the plan objectives are identified and consideration of their effects

[3] National Planning Policy Framework: draft text for consultation

[4] The Birds Directive and Habitats Directives are transposed into law in England and Wales by The Conservation of Habitats and Species Regulations 2017 (as amended). This includes all post-Brexit changes.

[5] UK Government (2023). Guidance: Habitats regulations assessments: protecting a European site Habitats regulations assessments: protecting a European site - GOV.UK

[6] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17: In April 2018 an important judgment in the CJEU ruled that Article 6(3) of the Habitats Directive must be interpreted as meaning that mitigation measures should be assessed within the framework of an AA and that it is not permissible to take account of mitigation measures at the screening stage. Considering this judgement, the implications have been taken into account as part of the HRA screening process in support of the Cheddar 2 project.

are given in comparison to those in the plan. A plan which has AEoI of a Habitats Site cannot be permitted if alternative solutions are available, except where the criteria for imperative reasons of overriding public interest are met (IROPI, see Stage 4).

- Stage 4 Imperative Reasons of Overriding Public Interest (IROPI) – where there are no alternatives that have no or lesser effects on Habitats Site, and the IROPI criteria are met, compensatory measures are developed and secured.

The stages as described above, are used to ensure compliance with the Habitats Regulations and so principally reflect the stepwise legislative tests applied to the Plan, as required.

The HRA will be undertaken in accordance with currently available guidance (UK Governments, 2021) approach and legislation[7] , exercising professional judgement as required under the Habitats Regulations. Guidance that was followed to produce this report include the UK Water Industry Research (UKWIR) report 'Strategic Environmental Assessment and Habitat Regulations Assessment - Guidance for Water Resources Management Plans and Drought Plans'[8] and the Environment Agency's Drought Plan Guideline (DPG) published in June 2025 (DPG2025)[9]. It will follow the staged HRA approach (only as far as is necessary), commencing with the Stage 1 screening of each drought option in AWS'DP27.

2.2 APPROACH TO HRA STAGE 1 SCREENING

The purpose of the Stage 1 HRA Screening is to determine whether any part of the Plan in question (in this case each drought option of the DP27) is likely to have a significant effect on a Habitats Site (alone or in-combination with other plans and projects), including areas of compensation habitat, areas of functionally linked land, and the ability for abstractions to occur for the management of designated wetland sites. This is judged in terms of the implications of the plan for a site's conservation objectives, which relate to its 'qualifying features' (i.e. those Annex I habitats, Annex II species, and Annex I bird populations[10], or Ramsar criterion, for which it has been designated). Significantly, the HRA is based on a rigorous application of the precautionary principle (i.e. if there is insufficient information to ascertain that there would be no LSE). Where uncertainty or doubt remains, an impact should be assumed, triggering the requirement for Stage 2 AA of that option.

In April 2018[11] there was an important judgment in the CJEU which ruled that Article 6(3) of the Habitats Directive must be interpreted as meaning that mitigation measures should be assessed within the framework of an AA and that it is not permissible to take account of mitigation measures at the screening stage. Considering this judgement, the implications have been taken into account as part of the HRA screening process in support of the DP27.

Stage 1 HRA screening also has to conclude whether any effects could result from the implementation of the plan in-combination with other plans and projects, and whether these would adversely affect the integrity of a Habitats Site.

Therefore, the purpose of Stage 1 HRA screening is to screen in/out the further assessment of qualifying features of designated sites based on Likely Significant 'negative' Effects.

2.2.1 Identifying Habitats Site

The initial list of Habitats Site for screening has been derived by adopting a distance-based threshold of 10km from the Plan, plus exceptional, longer impact pathways.

The use of a 10km threshold plus exceptional pathways approach is based on precedent set for previous HRAs of projects/plans through consultation with statutory consultees. It is based on the premise that most significant effects on qualifying species and habitats will occur within a maximum 10km radius of the source of impact, except where there are exceptional pathways such as major downstream or coastal dispersion effects, or larger foraging and dispersal distances for mobile species (e.g., bats, migratory fish, or otter).

An impact pathway is any means or mechanism by which the implementation of a plan or project might result in an effect, either positively or negatively, on a Habitat site. This could include direct effects (e.g. habitat

[7] UK Government (2019). Conservation of Habitats and Species Regulations (Amendment) (EU Exit).
[8] Strategic Environmental Assessment - Guidance for Water Resources Management Plans and Drought Plans
[9] Water company drought plan guideline, 2025 - GOV.UK
[10] Annexes are contained within the relevant EC Directive
[11] Court of Justice for the European Union's ruling on People Over Wind and Sweetman ('Sweetman II') vs Coillte Teoranta, Case C-323/17.

destruction), indirect effects (e.g. increased visitor pressure), or cumulative effects (e.g. changes in water quality or air pollution levels) that could affect the integrity of the Habitat site. This distance-based threshold has been based on the red line boundary where available (i.e. Reservoir and surrounding infrastructure, and Water treatment works (WTWs) component) and a defined buffer where no red line boundaries were available (i.e. 100m survey area around the four pipeline components acting as draft red line boundary).

The qualifying habitats and species of Habitats Site are vulnerable to a wide range of impacts such as physical loss or damage of habitat, disturbance from noise, light, human presence, changes in hydrology (e.g. changes in water levels/flow, flooding), changes in water or air quality and biological disturbance (e.g. direct mortality, introduction of disease or non-native species). The assessment considered the construction and operational effects of the Plan.

In determining the likelihood of significant effects on Habitats Site, particular consideration was given to the possible source-receptor pathways through which effects may be transmitted from activities associated with the Plan, to features contributing to the integrity of the Habitats Site (e.g. surface water catchments, water quality, etc.).

In addition, the HRA Stage 1 Screening has identified any habitat outside the Habitats Site that also supports the qualifying species populations that use the Habitat site in question. This off-site functionally-linked land (or sea) is particularly relevant to mobile qualifying species (e.g., birds, bats, invertebrates, fish and otters). The precautionary principle applies equally to functionally-linked land, so where there is insufficient information to ascertain that there would be no LSE, an AA will be required. However, this does not mean that every possible parcel of land within reach of the Habitat site's qualifying populations must have been surveyed. The Boggis' case[12] establishes that there must be at least credible evidence that there could be a functional link between the location of the plan's effects and the Habitat site. The list of Habitats Site screened for AA can be found in **Section 4.2**.

2.2.2 Source information

Data on the Habitats Site and their interest features has been collected from the Joint Nature Conservation Committee (JNCC) and Natural England websites. These data include information on the attributes of the Habitats Site that contribute to and define their integrity, current conservation status and the specific sensitivities of the site, notably the site boundaries and the boundaries of the component Site of Special Scientific Interests (SSSI); the conservation objectives; the condition, vulnerabilities and sensitivities of the sites and their interest features; the current pressures and threats for the sites; and the approximate locations of the interest features within each site (if reported); and designated or non-designated functional habitats (if identified).

The following sources of published information were used:

- Relevant site citation documents.
- Site Register Entries.
- Standard Data Form (SPA/SAC) or Information Sheet (Ramsar site).
- Conservation objectives (SACs and SPAs) and Supplementary Advice on Conservation Objectives (where available) including the targets and attributes that inform favourable condition status.
- Site Improvement Plans (SIPs) (where available) for SACs and SPAs.
- Environment Agency Review of Consents information.
- Favourable Condition Tables which are set out for every SSSI that underpins a Habitats Site and can often be applicable to the Habitats Site's qualifying features.
- Article 12 (SPAs) and Article 17 (SACs) status reports.
- Site condition assessment has been integrated with SSSI assessments through Common Standards Monitoring (CSM).
- Definitions of Favourable Conservation Status (where available for species/habitat).
- Habitat preferences for the qualifying species (e.g. nesting, foraging, commuting) and food preferences.

[12] Boggis and Another v Natural England: Court of Appeal, 20 Oct 2009

- Hydrological, ground water and water quality assessment within the EAR Appendix A for each drought action.
- Physical characteristics of the habitats and environment influencing them.

This information allows identification of those features of each site which determine site integrity and the specific sensitivities of the site, as well as an analysis of how potential impacts of the Plan may affect site integrity.

2.2.3 Identification of Impacts to Habitats Site

In determining the likelihood of significant effects on Habitats Site from drought actions listed in **Table 3-1**, particular consideration will be given to the possible source-receptor pathways through which effects may be transmitted from activities associated with drought options to features contributing to the integrity of the Habitats Site (e.g. groundwater or surface water catchments, air etc). **Table 2-1** shows the type of impacts drought actions could have on Habitat site qualifying features. It should be noted that the list below is not an exhaustive list of potential impact pathways. The UKWIR guidance[13] for plans includes accepted zones of influence for certain impacts, as repeated in **Table 2-1**, however the best and latest information should always be used to inform an assessment. Where possible, robust universal assumptions regarding the sensitivities of Habitat site interest features will also be specified and applied at screening, for example:

- for groundwater sources and groundwater fed habitats, the EA consider that significant effects as a result of ground water abstractions are unlikely on Habitats Site over 5km from the abstraction.

Sites over 10km from the Plan that are not hydrologically linked and which do not support wide-ranging mobile species are considered sufficiently remote such that any environmental changes will be effectively nil, and as such, there will be no effects on sites beyond this distance (and so no possibility of in-combination effects).

Table 2-1: Potential impacts of components

Broad categories of potential impacts on Habitats Site, with examples	Examples of activities responsible for impacts (example distance considerations in italics)
Physical Loss: • Removal • Smothering	**Development of infrastructure associated with option,** e.g. new or temporary pipelines, transport infrastructure, temporary weirs. **Indirect effects from reductions in flow,** e.g. drying out of water-margin habitats. Physical loss is likely to be significant where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats Site is designated, or where natural processes link the option to the site, such as through hydrological connectivity downstream of an option, longshore drift along the coast, or the option impacts the linking habitat).
Physical damage: • Sedimentation/silting • Prevention of natural processes • Habitat degradation • Erosion • Fragmentation • Severance/barrier effect • Edge effects	**Direct or indirect impacts leading to permanent and/or temporary damage of available habitat, sedimentation/siltation, fragmentation, etc.** Physical damage is likely to be significant where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat that supports species for which a Habitats Site is designated, or where natural processes link the option to the site, such as through hydrological connectivity downstream of an option or sediment drift along the coast.

[13] UKWIR (2021). Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. UK Water Industry Research Limited, London

Broad categories of potential impacts on Habitats Site, with examples	Examples of activities responsible for impacts (example distance considerations in italics)
Water table/availability: • Drying • Flooding/stormwater • Changes to surface water levels and flows • Changes in groundwater levels and flows • Changes to coastal water movement	**Changes to water levels and flows due to increased water abstraction, reduced storage, or reduced flow releases from reservoirs to river systems. Potential for changes to habitat availability, for example reductions in wetted width of rivers leading to desiccation of macrophyte beds.** These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the option and the Habitats Site, and sometimes whether the option is up or down stream from the Habitats Site.
Toxic contamination: • Water pollution • Soil contamination • Air Pollution	**Reduced dilution in downstream or receiving waterbodies due to changes in abstraction or reduced compensation flow releases to river systems.** These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the option and the Habitats Site, and sometimes whether the option is up or down stream from the Habitats Site.
Non-toxic contamination: • Nutrient enrichment (e.g., of soils and water) • Algal blooms • Changes in salinity • Changes in thermal regime • Changes in turbidity • Changes in sedimentation/silting • Changes to water chemistry	**Changes to water salinity, nutrient levels, turbidity, thermal regime due to increased water abstraction, discharges, storage, or reduced compensation flow releases to river systems.** These effects are only likely to be significant where the boundary of the option extends within the same ground or surface water catchment as the Habitats Site. However, these effects are dependent on hydrological continuity between the option and the Habitats Site, and sometimes whether the option is up or down stream from the Habitats Site.
Biological disturbance: • Direct mortality • Changes to habitat availability • Out-competition by non-native species • Selective extraction of species • Introduction of disease • Rapid population fluctuations • Natural succession	**Mortality or injury** Likely to be a risk where the boundary of the option extends within or is directly adjacent to the boundary of the Habitats Site, or within/adjacent to an offsite area of known foraging, roosting, breeding habitat (that supports species for which a Habitats Site is designated). **Creation of new pathway for spread of non-native invasive species.** This effect is only likely to be significant where the option is situated within the Habitats Site or an upstream tributary of the Habitats Site, but also for inter-catchment water transfers.

Most of the drought options comprise a change to an existing abstraction licence, with little or no requirement for additional infrastructure, and as such, few of these options can be considered to have a 'construction' phase. Where no construction is expected to occur, only the operational phase will be assessed.

Where uncertainty remains after screening, and it cannot be concluded that a component is not likely to have significant effects on the qualifying features of a Habitats Site, the component should be taken forward to Stage 2, which requires a full Appropriate Assessment of that Plan to be undertaken.

2.3 APPROACH TO STAGE 2 APPROPRIATE ASSESSMENT

Where a risk of LSE is identified at HRA Stage 1 Screening (noting the precautionary principle), the DP27 is subject to Stage 2 AA which will consider the potential impact pathways of the DP27, both during construction and operation, that could impact on attribute targets associated with a Habitats sites qualifying features.

The AA is an extension of the assessment processes undertaken at the screening stage, with LSE (or areas of uncertainty) examined to determine whether there will be any AEoI of any Habitats site taking into account the conservation objectives.

Where an LSE has been identified at the screening stage (noting the precautionary principle), an Informal HRA, will be prepared to provide the Competent Authority responsible for undertaking the AA and integrity test with sufficient information to do so.

The Informal HRA will consider the potentially damaging aspects of the Plan, both construction and operation, and the potential effects on the associated Habitats site's qualifying features and achievement of the conservation objectives characterised the impacts in terms of their likelihood, nature, scale, severity and duration.

The potential for AEoI of a Habitats Site depends on the scale and magnitude of the action and its predicted impacts, taking into account the distribution of the qualifying features across the site in relation to the predicted impact and the location, timing and duration of the proposed activity and the level of understanding of the effect, such as whether it has been recorded before and, based on current ecological knowledge, whether it can be expected to operate at the site in question.

2.3.1 Impact Pathways

Where required, the potential impact pathways associated with AWS' DP27 will be considered in the context of their potential effect on the qualifying features and achievement of the conservation objectives for the Habitats Site under consideration, and to characterise the impacts in terms of their likelihood, nature, scale, severity and duration. To determine if identified impact pathways could have an adverse effect on site integrity, the following parameters will be used as appropriate to define the impact (i.e. mechanism by which effects are caused):

- Impact type – direct or indirect, positive or negative;
- Probability – the probability/likelihood of an impact occurring based on the change in physical environment;
- Magnitude of impact – the 'amount' or intensity of an impact. This may sometimes be synonymous with 'extent' (see below) for certain impacts, such as habitat loss;
- Extent of impact – the area over which the impact will be felt;
- Duration of impact – how long it will occur. The guidelines suggest that ecological impact durations should be described in terms of ecological characteristics (e.g. species lifecycles/longevity) rather than human timeframes;
- Timing of impact – when it will occur, taking note of seasonality;
- Frequency of impact – how often it will occur; and
- Reversibility of impact – whether recovery or reinstatement is possible.

2.3.2 Adverse Effects on Integrity of a Site

An AEoI is likely to be one which prevents the Habitat site from making the same contribution to favourable conservation status for the relevant feature. In addition, an adverse effect would be one which causes a detectable reduction of the features for which a site was designated, at the scale of the site rather than the location of the impact.

The assessment of AEoI considers the current condition of the associated site in line with the relevant judgements in the European Court of Justice and UK courts (e.g. the Waddenzee Judgement [14]).

The integrity test is the conclusion of an AA and requires the competent authority to ascertain whether the proposed DP27 (either alone or in-combination with other plans or projects), will have no AEoI. The following definition is provided by Defra: the integrity of the site is *"the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the level of populations of the species for which it was classified"*[15].

The assessment considers specific mitigation measures that may be available to reduce the likelihood, magnitude, scale and duration of the effect on qualifying features, which can be applied at the AA stage to inform the overall integrity test[16]. These measures will include both avoidance and reduction measures, with the former being preferred.

2.4 REVIEW OF POTENTIAL IN-COMBINATION EFFECTS

The HRA process requires that the effects of other projects, plans or programmes be considered for effects on Habitats Site in-combination with the Project. In accordance with the legislation, the following approach will be adopted for the in-combination assessment:

- STEP 1 – Does the Plan have no discernible effect, whatsoever, on the Habitats Site? If not, then there's no need for in-combination assessment, as logic dictates it can't have in-combination effects.
- STEP 2 - Does the Plan, alone, have an adverse effect on the Habitats Site? If so, then there's no need for in-combination assessment as consent cannot be given unless the HRA Stages 3 and 4 derogation tests are met, in which case all residual effects of the scheme acting alone will be compensated for.
- STEP 3 – Does the Plan have a discernible effect, but one which is not significant in the context of the Habitats Regulations (i.e. AEoI) alone? If so, then an in-combination assessment is required.
- STEP 4 – Identify the other Plans/Projects that also have discernible effects that (1) aren't an adverse effect alone but (2) might act in-combination with effects of your Plan. It is normal practice to agree this list of potential in-combination Plans/Projects with the Competent Authority before doing the assessment.
- STEP 5 – Assess these other Plans/Projects in-combination with this Plan.

The above steps recognise that effects acting alone are already dealt with for the Plan and should not form part of an in-combination assessment. It is only those effects that may become adverse when acting in combination that are included.

Equally, in accordance with best-practice guidance, any projects or plans which have been consented, implemented and completed are considered to be part of the baseline (and should have been subject to their own HRA before being consented and implemented). Therefore, these will not be included as part of any in-combination assessment for this proposed scheme; any ongoing operational effects will be noted as part of the baseline environment.

[14] A significant effect is defined in paragraph 49 of the Waddenzee Case C-127/02 as follows "pursuant to the first sentence of Article 6(3) of the Habitats Directive, where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site. The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project."

[15] Defra Circular 01/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and Their Impact Within The Planning System. August 2005.

[16] The "People over Wind" or "Sweetman" judgment ruled that Article 6(3) of the Habitats Directive must be interpreted as meaning that mitigation measures should be assessed within the framework of an appropriate assessment and that it is not permissible to take account of mitigation measures at the screening stage.

3. PRESENTATION OF THE DROUGHT ACTIONS

AWS uses a combination of groundwater and surface water sources for abstraction, which include multiple storage reservoirs (Rutland Water, Grafham Water, Pitsford Water, Alton Water, Covenham Reservoir and Ardleigh Reservoir), natural catchment reservoirs and eight river intakes. On average they abstract 1,100 Ml/d for storage and treatment, which during high demand can increase to an estimated 1,400 Ml/d [17].

3.1 DROUGHT ACTIONS

Seven Drought Actions have been presented by Anglian Water. River Nene (Rutland Water), River Nene (Pitsford Water) and River Gt Ouse (Grafham Water) are surface water actions and are more likely to be used in winter. River Trent (Hall WTW), Costessey (Heigham WTW) and Wellington Wellfield (Stoke Ferry & Marham WTW) are groundwater actions and are more likely to be used in summer. Lower Colne (Ardleigh Reservoir) is a groundwater action and could be used in summer or winter. Details of these actions are provided in **Table 3-1**.

Table 3-1: Description of the seven Drought Actions included in DP27

Drought Actions	DP22 name	Type	Description
Costessey (Heigham WTW)	River Wensum (Groundwater source) Drought Permit	Groundwater	Increase the max annual abstraction for the groundwater source. Increase the annual licence from 2000 to 4,800 Ml/yr.
Wellington Wellfield (Stoke Ferry & Marham WTW)	Wellington Wellfield (Marham) Drought Permit	Groundwater	Increase the max daily and associated yearly abstraction from the Wellington Wellfield and Denton Lodge groundwater source. Increase the daily abstraction of the two groups of sources by a maximum of 2.726 Ml/d to 25 Ml/d total output.
River Gt Ouse (Grafham Water)	River Great Ouse: Offord Intake (Grafham Water) Drought Permit	Surface water	Reduce the MRF at Offord abstraction point on River Gt Ouse to allow abstraction to continue at lower flows. Stage 1 – Existing MRF, abstraction at up to 100% of the flow in excess of the MRF. Stage 2 – 50% reduction MRF to 68 Ml/d, abstraction at up to 75% of the flow excess of the MRF.
River Nene (Rutland Water)	River Nene (Wansford Intake/ Rutland Water) Drought Permit	Surface water	Winter or summer authorisation to allow increased filling of Rutland Water through a reduction of up to 50% in the MRF. Winter (December-April) - 125 to 62.5 Ml/d. Summer (May-November) - 150 to 75 Ml/d.
River Nene (Pitsford Water)	River Nene (Duston Mill) Drought Permit	Surface water	Reduce the MRF at Duston Mill abstraction point on River Nene to allow abstraction to continue at lower flows. 50% reduction in the MRF to 17.05 Ml/d
Lower Colne (Ardleigh Reservoir)	River Colne Augmentation (Ardleigh Reservoir) Drought Permit	Groundwater	Increase licensed abstraction at Balkerne by 3Ml/d (6Ml/d to 9Ml/d), only to provide additional augmentation to the River Colne. The daily licence rates for Aldham and Cooks Mill stay the same i.e. for the transfer of water directly into the supply system at up to 6Ml/d.

[17] Anglian Water Drought Plan 2027

Drought Actions	DP22 name	Type	Description
			Increase the instantaneous, annual and group licence conditions to support the use of a permit for up to 6 months (assuming only being used for 1 year out of the 5 in the aggregate).
River Trent (Hall WTW)	River Trent Drought Permit	Surface water	Reduce Hands Off Flow (HOF) from 1700 Ml/d to 1450 Ml/d Reduce the daily abstraction rate when river flows are below 1700 Ml/d to 40 Ml/d instead of 64 Ml/d

For all of these Drought Options, no significant construction works will be required. Details of anticipated enabling work is provided in Table 3-2.

Table 3-2: Anticipated Enabling Work associated with each Drought Action

Drought Actions	Type	Enabling Work
Costessey	Groundwater	Existing abstraction points and pump setups. Successful pump test completed in 2013. May require optimisation of pumping setup and pipelines to reach max output Separate licence condition requires Costessey Pits to be kept above a certain level so may require some minor engineering to allow boreholes to augment the pits and transfer water to supply. Assuming no significant construction needed. Permit never used.
Wellington Wellfield	Groundwater	Existing abstraction points and pump setups. Pump test completed in 2020 which showed system could output almost 25Ml/d May require optimisation of pumping setup and pipelines to reach max output Water quality challenges identified when transferring over 20 Ml/d so possible temporary treatment pipeline injection needed. Temporary assets would need to be installed at suitable locations. Permit never used.
Grafham	Surface water	Existing abstraction point pumping station. May require optimisation of pumping setup to efficiently abstract at lower flows. Assuming no significant construction needed. Permit never used.
Rutland	Surface water	Existing abstraction point pumping station. May require optimisation of pumping setup to efficiently abstract at lower flows. Assuming no significant construction needed. Permit used briefly in 2011-2012 winter.
Pitsford	Surface water	Existing abstraction point pumping station. May require optimisation of pumping setup to efficiently abstract at lower flows. Assuming no significant construction needed. Permit used briefly in 2011-2012 winter.
Ardleigh	Groundwater	Existing river augmentation abstraction points and pump setup. Balkerne has recently undergone pump and control upgrades to allow 9 Ml/d to be abstracted. Assuming no significant construction needed. Permit never used.

Drought Actions	Type	Enabling Work
Trent	Surface water	Existing abstraction point pumping station. May require optimisation of pumping setup to efficiently abstract at lower flows. Assuming no significant construction needed. Permit never used.

3.2 DROUGHT PERMIT WATER RESOURCES MANAGEMENT PLAN (WRMP)

AWS sets out how it will maintain planned levels of service in its WRMP. The latest WRMP was published in 2024 and continues to use a "twin-track" approach of demand management measures together with timely development of new water sources to ensure a positive supply/ demand balance during prolonged dry weather. For the WRMP24, the region has been subdivided into 27 Water Resource Zones (WRZs), each with their own supply and demand challenges. The WRMP24 sets out the actions AWS will take to maintain its customer levels of service for water supply reliability, in particular planning for a temporary use ban should only be put into place once in every 10 years on average, and/or a nonessential use ban on selected water uses to only be implemented once in every 40 years. Planning is conducted with the objective that rota cuts should not be required.

3.3 DROUGHT PLAN

The AWS Drought Plan complements the WRMP and is focused on the actions that AWS will take during drought conditions, when there are increased risks of temporary water use restrictions being required along with implementing temporary measures to augment water supply availability, in order to maintain essential water supplies to all customers. Water companies in England and Wales are required to prepare and maintain statutory Drought Plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and in accordance with the Drought Plan Regulations 2005 and the Drought Plan Direction 2025.

The period encompassed by the DP27 covers 2027 - 2032. The next revision of the Drought Plan would be published in 2031/32. Only those drought actions which are relevant to the period encompassed by the DP27 are considered in the HRA process. To this end, environmental effects of the DP27 actions are considered within the context of the current licence operating conditions. Potential new sources (which AWS may bring online in the future), new drought actions, or revisions to existing actions which are only envisaged to become operational post 2032 have, therefore, been excluded from and HRA screening process. The same approach has also been undertaken for in-combination effects with other projects and programmes, in that only those that are likely to be effective in the period to 2032 were considered in the HRA.

3.4 ANGLIAN WATER DROUGHT ACTIONS

3.4.1 Supply Side Actions

The supply side actions proposed within the DP27 are associated with the development of potential actions to help improve outputs from existing water sources. Reservoir actions seek to conserve or increase the amount of water stored (and therefore available for supply) during a drought period, and direct intakes seek to supplement water supply, and in some cases, to help conserve reservoir storage. Groundwater actions seek to supplement water supply.

Standard supply actions would include actions around optimising the amount of water available within existing assets within current abstraction licences. The overarching strategy for managing supply in AW is now carried out through a process called production planning which will also be introduced in DP27. The proposed standard supply actions are as follows:

- River augmentation and support.
- Alternative river abstraction sources.
- Supply system optimisation and conjunctive use.
- Source commissioning, maintenance and rehabilitation.
- Tankering.

- Internal and external transfers.
- Loss reduction.

The more severe supply actions include:

- Drought permits
- EA drought orders

The supply side drought measures outlined in the DP27 will need to be implemented through drought permits. Under drought conditions, where a serious deficiency of supplies threatens to occur, or already exists, AWS may require recourse to drought orders in order to increase supplies to manage the supply demand balance. These are emergency actions that would need to be further explored with the Environment Agency or neighbouring water companies to clarify the requirements for environmental assessment in advance of Drought Order application. Therefore, only drought permits have been assessed as part of the HRA screening.

For existing water sources, drought permits are used to increase the amount of water that can be abstracted to supplement supplies and, where possible, to conserve reservoir storage. AWS may also apply for drought permits to increase winter abstractions. If confirmed, drought permits may only be authorised for specified six-month (winter or summer) periods, subject to renewal only for further limited periods.

The DP27 includes seven supply side actions that would require a drought permit. Individual environmental assessments have been carried out for each of the potential drought permit actions using a structured approach, in line with the Environment Agency's Drought Plan Guideline[18]. These environmental assessments are used to inform the HRA.

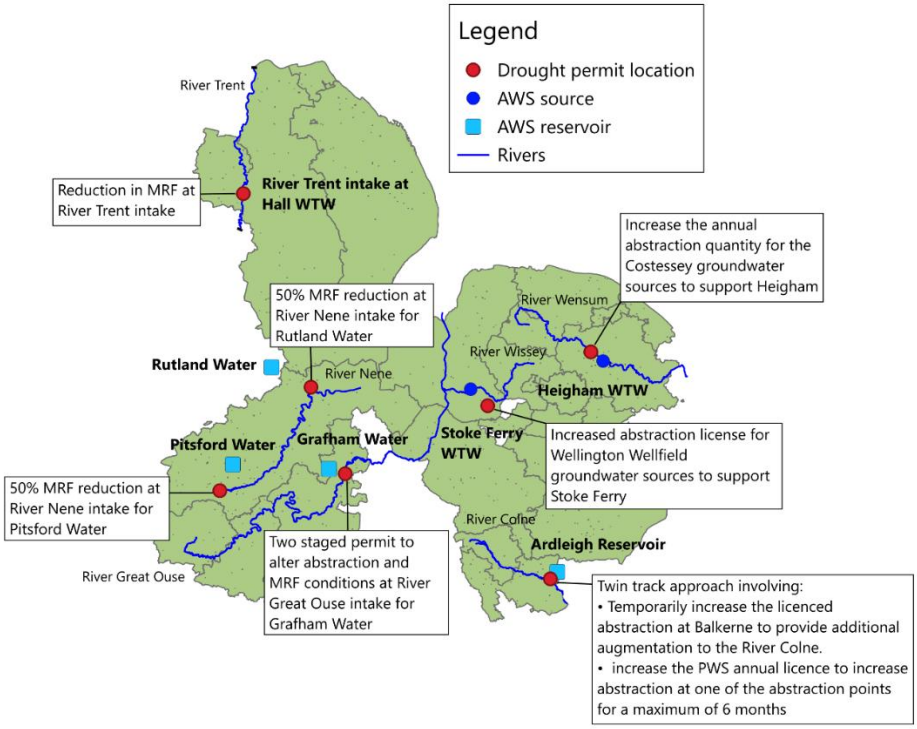

Figure 3-1: Anglian Water drought permit locations and associated sources for the drought

3.4.2 Demand Side Actions

Demand actions follow a three-tiered strategy focused on smart metering, leakage reduction and water efficiency. Most actions will be initiated under business-as-usual (BAU) conditions and are then intensified through drought levels (1–4). Demand actions can be implemented proactively, if required. These include:

[18] https://www.gov.uk/government/publications/water-company-drought-plan-guideline-2025/water-company-drought-plan-guideline-2025

- Communication campaigns and messaging
- Water efficiency activities
- Customer Metering
- Targeted leakage reduction
- Pressure Optimisation
- Tariffs

The more severe demand actions include:

- Temporary Use Ban (TUBs)
- Non-essential Use Ban (NEUBs)
- Emergency drought orders

Anglian Water may implement Emergency Drought Orders (Severe Restrictions) to temporarily supply water by means of rota cuts. Emergency Drought Orders may be introduced in the event of an exceptional drought, in consultation and liaison with the Environment Agency, local authorities and the Consumer Council for Water. This situation would be extremely unlikely to occur based on records of previous drought events in the Anglian Water Supply Area.

3.4.3 Extreme Supply and Demand Actions

There are some potential extreme supply and demand side management actions that may be considered during a drought to mitigate the need for rota-cuts in an emergency situation. AWS has completed further consideration of such actions to provide supply benefits before a Level of Service (LoS) 4 trigger is crossed. They are also known as 'more before 4' actions. At present these actions are theoretical only and include:

Extreme supply-side actions

- Groundwater
  - Lower borehole pumps or increase size of borehole pump
  - Increase borehole depth
  - Satellite boreholes
  - Recommissioning / Commissioning out-of-service boreholes
  - Use of 3rd party boreholes
  - Repurpose river support boreholes
- River Support
- Drought Permit and Orders
- Temporary Treatment
  - UV disinfection
  - Nitrate removal and / or blending
  - Iron / Turbidity removal
- Water Recycling
  - Advanced water recycling, diverting recycled water so that it can support an existing abstraction point
  - Water re-use, diverting recycled water to support other water users
- Overland pipes
- Tankering
- Utilising other significant water bodies
- Supply schemes
- Resource trading and transfers
- Loss Reduction

Extreme demand-side actions

- Extreme Communications Plan
- Extreme Water Efficiency & Customer Metering
- Tariffs
- Extreme Pressure Management
- Extreme Targeted Leakage Reduction
- Removal of exceptions

3.4.4 Supporting Information

Drought actions included in the HRA screening are documented by AWS in the DP27 and relevant Appendices. It is noted that some drought actions may have different environmental effects depending on the season of implementation (for example a summer vs a winter drought). As drought measures can theoretically be required and implemented at any time of year, overall impacts have been assessed where possible on a worst-case basis. Environmental assessment studies of AWS drought permit / order sites have been carried out and information from these studies are used to inform the HRA.

4. HRA SCREENING

4.1 HABITATS SITES IDENTIFIED FOR SCREENING

The desk study identified that the Plan has the potential to have LSE on 16 Habitats Sites. These are shown in **Figure 4-1**: Location of Habitats Sites included within this assessment in relation to the drought permits and are listed in **Table 4-1**, for each component.

The demand side drought actions and extreme demand side actions have been excluded as no effects are anticipated. The extreme supply side actions have been classed as potential action types rather than specific actions and have therefore been excluded from this report. If the extreme supply side actions are needed in the future, the actions will be developed and appropriate environmental assessments will be carried out in a separate report.

Table 4-1: Habitats Site associated with the Plan, within the study area

Drought Action	Habitats Site
Costessey (Heigham WTW)	Breydon Water SPA Breydon Water Ramsar site River Wensum SAC Norfolk Valley Fens SAC The Broads SAC Broadland SPA Broadland Ramsar site
Wellington Wellfield (Stoke Ferry & Marham WTW)	Breckland SAC Breckland SPA Norfolk Valley Fens SAC
River Gt Ouse (Grafham Water)	Eversden and Wimpole Woods SAC Ouse Washes SAC Ouse Washes Ramsar site Ouse Washes SPA Portholme SAC The Wash and North Norfolk Coast SAC The Wash SPA The Wash Ramsar site
River Nene (Rutland Water)	Barnack Hills & Holes SAC Nene Washes SAC Nene Washes Ramsar site Nene Washes SPA Orton Pit SAC Rutland Water Ramsar site Rutland Water SPA The Wash and North Norfolk Coast SAC The Wash SPA The Wash Ramsar site

Drought Action	Habitats Site
River Nene (Pitsford Water)	Nene Washes SAC Nene Washes Ramsar site Nene Washes SPA The Wash and North Norfolk Coast SAC The Wash SPA The Wash Ramsar site Upper Nene Valley Gravel Pits SPA Upper Nene Valley Gravel Pits Ramsar site
Lower Colne (Ardleigh Reservoir)	Abberton Reservoir SPA Abberton Reservoir Ramsar site Colne Estuary (Mid-Essex Coast Phase 2) SPA Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site Essex Estuaries SAC
River Trent (Hall WTW)	Humber Estuary SAC Humber Estuary SPA Humber Estuary Ramsar site

The HRA screening matrices for each of the identified Habitat Sites are provided in Annex-1: Screening assessment tables.

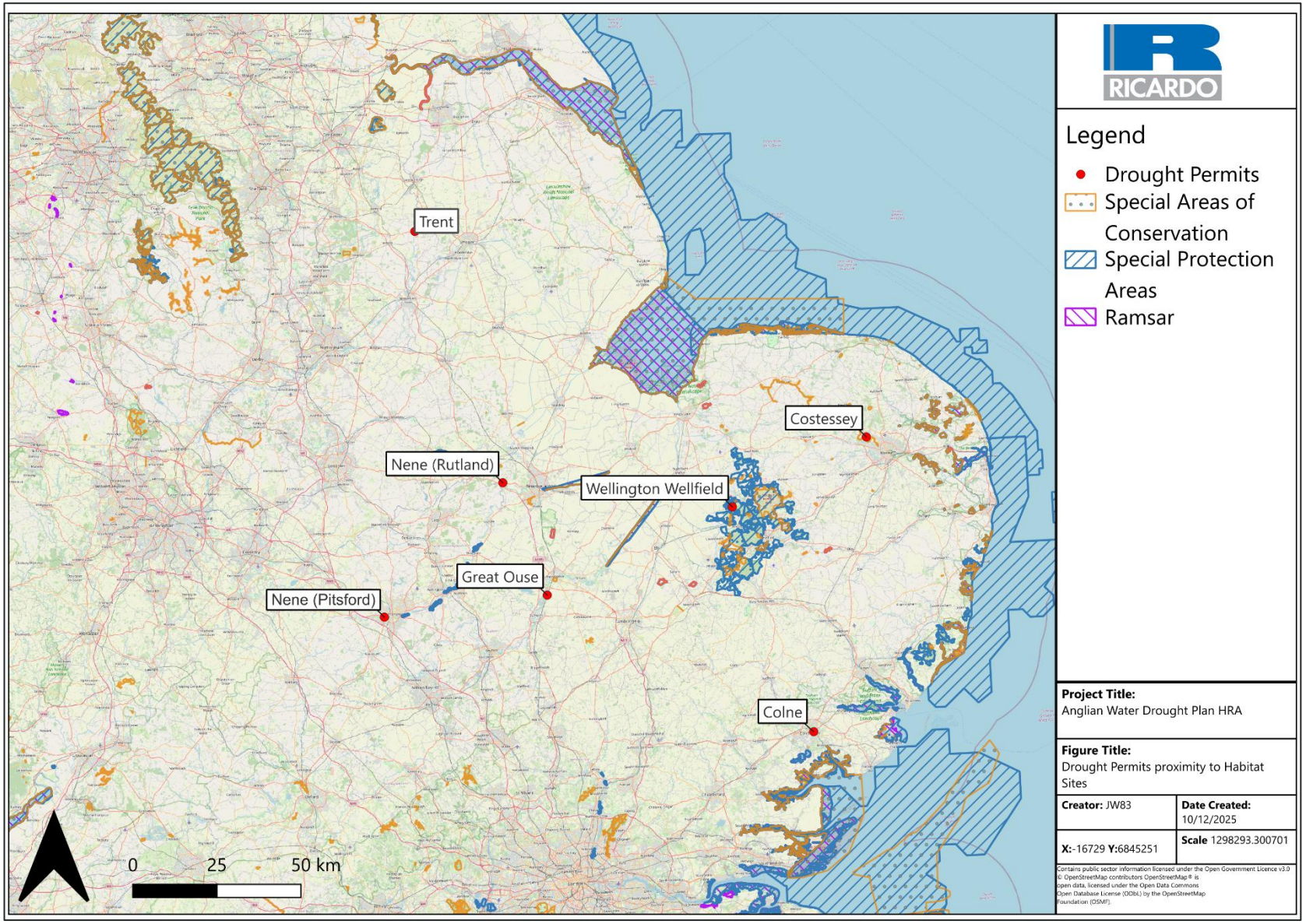

Figure 4-1: Location of Habitats Sites included within this assessment in relation to the drought permits

4.2 SUMMARY OF STAGE 1 SCREENING OF THE PLAN ALONE

A summary of the outcomes of the Stage 1 Screening for the Project is presented below in **Table 4-2**.

Table 4-2: Summary of the Stage 1 Screening on Habitats Site within the zone of influence

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
Abberton Reservoir SPA	Great crested grebe (*Podiceps cristatus)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Great cormorant (*Phalacrocorax carbo)* (Breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Mute swan (*Cygnus olor)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Eurasian wigeon (*Anas Penelope)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Gadwall (*Anas strepera)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Eurasian teal (*Anas crecca)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Northern shoveler (*Anas clypeata)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Common pochard (*Aythya farina)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Tufted duck (*Aythya fuligula*) (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Goldeneye (*Bucephala clangula)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Common coot (*Fulica atra)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Waterbird assemblage	LSE alone	Lower Colne (Ardleigh Reservoir)
Abberton Reservoir Ramsar site	Ramsar criterion 5 - Assemblages of international importance	LSE alone	Lower Colne (Ardleigh Reservoir)
	Ramsar criterion 6 – species/populations occurring at levels of international importance including Gadwall, Northern shoveler, Eurasian wigeon	LSE alone	Lower Colne (Ardleigh Reservoir)
Barnack Hills & Holes SAC	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)* (*important orchid sites)	No effect	River Nene (Rutland Water)
Breckland SAC	Inland dunes with open *Corynephorus* and *Agrostis* grasslands	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* – type vegetation	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
	European dry heaths	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)	No effect	Wellington Wellfield (Stoke Ferry & Marham WTW)
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
	Great crested newt (*Triturus cristatus)*	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
Breckland SPA	Eurasian stone curlew (*Burhinus oedicnemus)* (Breeding)	No effect	Wellington Wellfield (Stoke Ferry & Marham WTW)
	European nightjar (*Caprimulgus europaeus)* (Breeding)	No effect	Wellington Wellfield (Stoke Ferry & Marham WTW)
	Woodlark (*Lullula arborea)* (Breeding)	No effect	Wellington Wellfield (Stoke Ferry & Marham WTW)
Breydon Water SPA	Pied avocet (*Recurvirostra avosetta*),	LSE in-combination	Costessey (Heigham WTW)
	Beckwick's swan (*Cygnus columbianus bewickii*)	LSE in-combination	Costessey (Heigham WTW)
	Golden plover (*Pluvialis apricaria*)	LSE in-combination	Costessey (Heigham WTW)
	Lapwing (*Vanellus Vanellus*)	LSE in-combination	Costessey (Heigham WTW)
	Ruff (*Calidris pugnax*)	LSE in-combination	Costessey (Heigham WTW)
	Common tern (*Sterna hirundo*)	LSE in-combination	Costessey (Heigham WTW)
	Waterbird assemblage, Non-breeding	LSE in-combination	Costessey (Heigham WTW)
Breydon Water Ramsar site	Ramsar criterion 5 - Assemblages of international importance	LSE in-combination	Costessey (Heigham WTW)
	Ramsar criterion 6 – species/populations occurring at levels of international importance including Tundra swan (Cygnus columbianus bewickii), Northern lapwing	LSE in-combination	Costessey (Heigham WTW)
Broadland SPA	Bewick's swan	LSE in-combination	Costessey (Heigham WTW)
	Gadwall	LSE in-combination	Costessey (Heigham WTW)
	Hen harrier (*Circus cyaneus*)	LSE in-combination	Costessey (Heigham WTW)
	Ruff	LSE in-combination	Costessey (Heigham WTW)
	Shoveler	LSE in-combination	Costessey (Heigham WTW)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Whooper swan (*Cygnus cygnus*)	LSE in-combination	Costessey (Heigham WTW)
	Wigeon	LSE in-combination	Costessey (Heigham WTW)
	Great bittern (*Botaurus stellaris*)	LSE in-combination	Costessey (Heigham WTW)
	Marsh harrier (*Circus aeruginosus*)	LSE in-combination	Costessey (Heigham WTW)
Broadland Ramsar site	Ramsar criterion 2 The site supports a number of rare species and habitats within the biogeographical zone context, including the following Habitats Directive Annex I features: Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*, Alkaline fens, Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*, Desmoulin`s whorl snail (*Vertigo moulinsiana)*, Otter (*Lutra lutra)*, Fen orchid (*Liparis loeselii)*	LSE in-combination	Costessey (Heigham WTW)
	Ramsar criterion 6 – species/populations occurring at levels of international importance including: Gadwall, Northern shoveler, Eurasian wigeon	LSE in-combination	Costessey (Heigham WTW)
Colne Estuary (Mid-Essex Coast Phase 2) SPA	Dark-bellied brent goose (*Branta bernicla bernicla)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Common pochard (Breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Hen harrier (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Ringed plover (*Charadrius hiaticula)* (Breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Common redshank (*Tringa tetanus)* (Non-breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Little tern (*Sterna albifrons)* (Breeding)	LSE alone	Lower Colne (Ardleigh Reservoir)
	Waterbird assemblage	LSE alone	Lower Colne (Ardleigh Reservoir)
Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site	Ramsar criterion 1 - The site is important due to the extent and diversity of saltmarsh present.	LSE alone	Lower Colne (Ardleigh Reservoir)
	Ramsar criterion 2 - The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species.	LSE alone	Lower Colne (Ardleigh Reservoir)
	Ramsar criterion 3 - This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.	LSE alone	Lower Colne (Ardleigh Reservoir)
	Ramsar criterion 5 - Assemblages of international importance	LSE alone	Lower Colne (Ardleigh Reservoir)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Ramsar criterion 6 – species/populations occurring at levels of international importance including: Dark-bellied brent goose, Common redshank	LSE alone	Lower Colne (Ardleigh Reservoir)
Essex Estuaries SAC	Estuaries	LSE alone	Lower Colne (Ardleigh Reservoir)
	Mudflats and sandflats not covered by seawater at low tide	LSE alone	Lower Colne (Ardleigh Reservoir)
	Salicornia and other annuals colonizing mud and sand	LSE alone	Lower Colne (Ardleigh Reservoir)
	Spartina swards *Spartinion maritimae*	LSE alone	Lower Colne (Ardleigh Reservoir)
	Atlantic salt meadows *Glauco-Puccinellietalia maritimae*	LSE alone	Lower Colne (Ardleigh Reservoir)
	Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticosi*	LSE alone	Lower Colne (Ardleigh Reservoir)
	Sandbanks which are slightly covered by sea water all the time	LSE alone	Lower Colne (Ardleigh Reservoir)
Eversden and Wimpole Woods SAC	Barbastelle (*Barbastella barbastellus)*	No effect	River Gt Ouse (Grafham Water)
Humber Estuary SAC	Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks	LSE in-combination	River Trent (Hall WTW)
	Estuaries	LSE in-combination	River Trent (Hall WTW)
	Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats	LSE in-combination	River Trent (Hall WTW)
	Coastal lagoons	LSE in-combination	River Trent (Hall WTW)
	Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand	LSE in-combination	River Trent (Hall WTW)
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	LSE in-combination	River Trent (Hall WTW)
	Embryonic shifting dunes	LSE in-combination	River Trent (Hall WTW)
	Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram	LSE in-combination	River Trent (Hall WTW)
	Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland	LSE in-combination	River Trent (Hall WTW)
	Dunes with *Hippophae rhamnoides*; Dunes with sea-buckthorn	LSE in-combination	River Trent (Hall WTW)
	Sea lamprey (*Petromyzon marinus)*	LSE in-combination	River Trent (Hall WTW)
	River lamprey (*Lampetra fluviatilis)*	LSE in-combination	River Trent (Hall WTW)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Grey seal (*Halichoerus grypus)*	LSE in-combination	River Trent (Hall WTW)
Humber Estuary SPA	Great bittern (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Great bittern (Breeding)	LSE in-combination	River Trent (Hall WTW)
	Common shelduck (Tadorna tadorna) (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Eurasian marsh harrier (Breeding)	LSE in-combination	River Trent (Hall WTW)
	Hen harrier (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Pied avocet (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Pied avocet (Breeding)	LSE in-combination	River Trent (Hall WTW)
	Golden plover (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Red knot (Calidris canutus) (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Dunlin (Calidris alpina alpina) (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Ruff (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Black-tailed godwit (Limosa limosa islandica) (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Bar-tailed godwit (Limosa lapponica) (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Common redshank (Non-breeding)	LSE in-combination	River Trent (Hall WTW)
	Little tern (Breeding)	LSE in-combination	River Trent (Hall WTW)
	Waterbird assemblage	LSE in-combination	River Trent (Hall WTW)
Humber Estuary Ramsar Site	Ramsar criterion 1 - The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons.	LSE in-combination	River Trent (Hall WTW)
	Ramsar criterion 3 - The Humber Estuary Ramsar site supports a breeding colony of grey seals at Donna Nook.	LSE in-combination	River Trent (Hall WTW)
	Ramsar criterion 5 - Assemblages of international importance	LSE in-combination	River Trent (Hall WTW)
	Ramsar criterion 6 - species/populations occurring at levels of international importance	LSE in-combination	River Trent (Hall WTW)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	including: Common redshank, Common shelduck, Eurasian golden plover, Red knot, Dunlin, Black-tailed godwit, Bar-tailed godwit		
	Ramsar criterion 8 - The Humber Estuary acts as an important migration route for both river lamprey and sea lamprey between coastal waters and their spawning areas.	LSE in-combination	River Trent (Hall WTW)
Nene Washes SAC	Spined loach (*Cobitis taenia)*	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
Nene Washes SPA	Bewick's swan (wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Black-tailed godwit (breeding)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Gadwall (breeding, wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Garganey (*Anas querquedula)* (breeding)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Pintail (*Anas acuta)* (wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Shoveler (breeding, wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Teal (wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Wigeon (wintering)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Waterfowl assemblage (summer and winter)	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
Nene Washes Ramsar site	Ramsar criterion 2 - 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	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
	Ramsar criterion 6 - Species/populations occurring at levels of international importance including Tundra swan	LSE alone	River Nene (Rutland Water)
		LSE in-combination	River Nene (Pitsford Water)
Norfolk Valley Fens SAC	Alkaline fens	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
		No effect	Costessey (Heigham WTW)
	Northern Atlantic wet heaths with *Erica tetralix*	No effect	Costessey (Heigham WTW), Wellington Wellfield (Stoke Ferry & Marham WTW)
	European dry heaths	No effect	Costessey (Heigham WTW), Wellington Wellfield (Stoke Ferry & Marham WTW)
	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)	No effect	Costessey (Heigham WTW), Wellington Wellfield (Stoke Ferry & Marham WTW)
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
		No effect	Costessey (Heigham WTW)
	Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae*	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
		No effect	Costessey (Heigham WTW)
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	LSE alone	Wellington Wellfield (Stoke Ferry & Marham WTW)
		No effect	Costessey (Heigham WTW)
	Narrow-mouthed whorl snail (*Vertigo angustior)*	No effect	Costessey (Heigham WTW), Wellington Wellfield (Stoke Ferry & Marham WTW)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Desmoulins whorl snail	No effect	Costessey (Heigham WTW), Wellington Wellfield (Stoke Ferry & Marham WTW)
Orton Pit SAC	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.	No effect	River Nene (Rutland Water)
	Great crested newt	No effect	
Ouse Washes SAC	Spined loach	LSE alone	River Gt Ouse (Grafham Water)
Ouse Washes SPA	Bewick's swan (non-breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Black-tailed godwit (breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Gadwall (breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Garganey (breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Hen harrier (wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Mallard (breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Pintail (wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Ruff (breeding)	LSE alone	River Gt Ouse (Grafham Water)
	Northern shoveler (breeding, wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Eurasian Teal (wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Whooper swan (wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Wigeon (wintering)	LSE alone	River Gt Ouse (Grafham Water)
	Breeding bird assemblage	LSE alone	River Gt Ouse (Grafham Water)
	Waterbird assemblage	LSE alone	River Gt Ouse (Grafham Water)
Ouse Washes Ramsar site	Ramsar criterion 1 - The site is one of the most extensive areas of seasonally-flooding washland of its type in Britain	LSE alone	River Gt Ouse (Grafham Water)
	Ramsar criterion 2 - nationally rare plants and animals including invertebrate assemblage and nationally rare breeding waterfowl associated with seasonally flooding wet grassland.	LSE alone	River Gt Ouse (Grafham Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Ramsar criterion 5 - internationally important waterfowl assemblage (greater than 20,000 birds)	LSE alone	River Gt Ouse (Grafham Water)
	Ramsar criterion 6 - over winter the site regularly supports internationally important populations of: Bewick`s swan, gadwall pintail, shoveler, teal, whooper Swan, wigeon	LSE alone	River Gt Ouse (Grafham Water)
Portholme SAC	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis)*	LSE in-combination	River Gt Ouse (Grafham Water)
River Wensum SAC	Water courses of plain to montane levels with Ranunculion *fluitantis* and *Callitricho-Batrachion* vegetation	LSE alone	Costessey (Heigham WTW)
	Demoulin's whorl snail	LSE alone	Costessey (Heigham WTW)
	White-clawed crayfish *(Austropotamobius pallipes)*	LSE alone	Costessey (Heigham WTW)
	Brooke lamprey *(Lampetra planeri)*	LSE alone	Costessey (Heigham WTW)
	Bullhead *(Cottus gobio)*	LSE alone	Costessey (Heigham WTW)
Rutland Water SPA	Coot (wintering)	LSE alone	River Nene (Rutland Water)
	Gadwall (breeding, wintering)	LSE alone	River Nene (Rutland Water)
	Goldeneye (wintering)	LSE alone	River Nene (Rutland Water)
	Goosander (*Mergus merganser)* (wintering)	LSE alone	River Nene (Rutland Water)
	Great crested grebe (wintering)	LSE alone	River Nene (Rutland Water)
	Mute swan (wintering)	LSE alone	River Nene (Rutland Water)
	Northern shoveler (wintering)	LSE alone	River Nene (Rutland Water)
	Teal (wintering)	LSE alone	River Nene (Rutland Water)
	Tufted duck (wintering)	LSE alone	River Nene (Rutland Water)
	Wigeon (wintering)	LSE alone	River Nene (Rutland Water)
	Waterbird assemblage	LSE alone	River Nene (Rutland Water)
Rutland Water Ramsar site	Ramsar criterion 5 - waterfowl assemblage (winter)	LSE alone	River Nene (Rutland Water)
	Ramsar criterion 6 - population of international importance in spring/autumn including gadwall and northern shoveler	LSE alone	River Nene (Rutland Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
The Broads SAC	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.	LSE in-combination	Costessey (Heigham WTW)
	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* – type vegetation	LSE in-combination	Costessey (Heigham WTW)
	Transition mires and quaking bogs	LSE in-combination	Costessey (Heigham WTW)
	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	LSE in-combination	Costessey (Heigham WTW)
	Alkaline fens	LSE in-combination	Costessey (Heigham WTW)
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) *Priority feature	LSE in-combination	Costessey (Heigham WTW)
	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	LSE in-combination	Costessey (Heigham WTW)
	Desmoulin's whorl snail	LSE in-combination	Costessey (Heigham WTW)
	Fen orchid (*Liparis loeselii)*	LSE in-combination	Costessey (Heigham WTW)
	Ramshorn snail (*Aniscus vorticulus)*	LSE in-combination	Costessey (Heigham WTW)
	Otter	LSE in-combination	Costessey (Heigham WTW)
The Wash and North Norfolk Coast SAC	Sandbanks which are slightly covered by sea water all the time	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Mudflats and sandflats not covered by seawater at low tide	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Large shallow inlets and bays	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Reefs	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Salicornia and other annuals colonizing mud and sand	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Coastal lagoons	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Harbour seal (*Phoca vitulina)*	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Otter	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
The Wash SPA	Bewick's swan (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Pink-footed goose (*Anser brachyrhynchus*) (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
		LSE in-combination	River Nene (Rutland Water)
	Dark-bellied brent goose (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Common shelduck (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Wigeon (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Gadwall (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Pintail (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Black (common) scoter (*Melanitta nigra)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Goldeneye (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Eurasian oystercatcher (*Haematopus ostralegus)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Grey plover (*Pluvialis squatarola)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Red knot (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Sanderling (*Calidris alba)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Dunlin (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Black-tailed godwit (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Bar-tailed godwit (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Eurasian curlew (*Numenius arquata)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
	Common redshank (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Ruddy turnstone (*Arenaria interpres)* (Non-breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Common tern (Breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Little tern (Breeding)	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Waterbird assemblage	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
The Wash Ramsar site	Ramsar criterion 1: large shallow bay with very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Ramsar criterion 3: inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters.	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
	Ramsar criterion 5: assemblage of international importance.	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)

Habitats Site	Qualifying features	Likely Significant Effect Alone or in-combination?	Relevant Drought Action
		LSE in-combination	River Nene (Rutland Water)
	Ramsar criterion 6 (species/population occurring at levels of international importance) Spring/autumn: Eurasian oystercatcher (winter), grey plover (wintering), red knot (wintering), sanderling, Eurasian curlew (breeding), common redshank and Ruddy turnstone. Winter: pink-footed goose, dark-bellied brent goose, common shelduck, northern pintail, dunlin and bar-tailed godwit.	No effect	River Gt Ouse (Grafham Water)
		No effect	River Nene (Pitsford Water)
		LSE in-combination	River Nene (Rutland Water)
Upper Nene Valley Gravel Pits SPA	Great bittern (Non-breeding)	LSE in-combination	River Nene (Pitsford Water)
	Gadwall (Non-breeding)	LSE in-combination	River Nene (Pitsford Water)
	European golden plover (Non-breeding)	LSE in-combination	River Nene (Pitsford Water)
	Waterbird assemblage	LSE in-combination	River Nene (Pitsford Water)
Upper Nene Valley Gravel Pits Ramsar site	Ramsar criterion 5: assemblage of international importance	LSE in-combination	River Nene (Pitsford Water)
	Ramsar criterion 6 (species/population occurring at levels of international importance) Winter: Mute swan and gadwall.	LSE in-combination	River Nene (Pitsford Water)

4.3 SCREENING STATEMENT

4.3.1 Likely Significant Effects on Habitats Sites from the Plan alone

The HRA Stage 1 Screening identified 16 Habitats Sites which may have LSE by the drought permits alone are:

- Abberton Reservoir SPA (UK9009141), (all features screened in)
- Abberton Reservoir Ramsar site (UK11001), (all features screened in)
- Breckland SAC (UK0019865), (all features screened in except for semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). See Annex-1: Screening assessment tables**, Table AN- 2** for details)
- Colne Estuary (Mid-Essex Coast Phase 2) SPA (UK9009243), (all features screened in)
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site (UK11015), (all features screened in)
- Essex Estuaries SAC (UK0013690), (all features screened in)
- Nene Washes SAC (UK0030222), (all features screened in for River Nene (Rutland Water))
- Nene Washes SPA (UK9008031), (all features screened in for River Nene (Rutland Water))
- Nene Washes Ramsar site (UK11046), (all features screened in for River Nene (Rutland Water))
- Norfolk Valley Fens SAC (UK0012892), (all features screened in except for; Northern Atlantic wet heaths with *Erica tetralix*, European dry heaths, semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*), Narrow-mouthed whorl snail, Desmoulins whorl snail. See Annex-1: Screening assessment tables**, Table AN- 7** for details)

- Ouse Washes SAC (UK0013011), (all features screened in)
- Ouse Washes SPA (UK9008041), (all features screened in)
- Ouse Washes Ramsar site (UK11051), (all features screened in)
- River Wensum SAC (UK0012647), (all features screened in)
- Rutland Water SPA (UK9008051), (all features screened in)
- Rutland Water Ramsar site (UK11062), (all features screened in)

Therefore Stage 2 AA is required for these Habitats Sites, with regards to the operation of the Drought Actions. See **Table 4-2** for the full list of designated features which have been screened in for Stage 2 AA.

4.3.2 Likely Significant Effects on Habitats Sites from the Plan in-combination

The HRA Screening identified 17 Habitats Sites with LSE in-combination with other plans or projects:

- Breydon Water SPA (UK9009181), (all features screened in)
- Breydon Water Ramsar site (UK11008), (all features screened in)
- Broadland SPA (UK9009253), (all features screened in)
- Broadland Ramsar site (UK11010), (all features screened in)
- Humber Estuary SAC (UK0030170), (all features screened in)
- Humber Estuary SPA (UK9006111), (all features screened in)
- Humber Estuary Ramsar Site (UK11031), (all features screened in)
- Nene Washes SAC (UK0030222), (all features screened in for River Nene (Pitsford Water))
- Nene Washes SPA (UK9008031), (all features screened in for River Nene (Pitsford Water))
- Nene Washes Ramsar site (UK11046), (all features screened in for River Nene (Pitsford Water))
- Portholme SAC (UK0030054), (all features screened in)
- The Wash and North Norfolk Coast SAC (UK0017075), (all features screened in for River Nene (Rutland Water))
- The Wash SPA (UK9008021), (all features screened in for River Nene (Rutland Water))
- The Wash Ramsar site (UK11072), (all features screened in for River Nene (Rutland Water))
- Upper Nene Valley Gravel Pits SPA (UK9020296), (all features screened in)
- Upper Nene Valley Gravel Pits Ramsar site (UK11083), (all features screened in)
- The Broads SAC (UK0013577), (all features screened in)

4.3.3 No Likely significant effect anticipated

The HRA Stage 1 Screening concluded no effect for all qualifying features from the drought permits for 7 Habitats Sites:

- Barnack Hills & Holes SAC (UK0030031),
- Breckland SPA (UK9009201),
- Eversden and Wimpole Woods SAC (UK0030331),
- Orton Pit SAC (UK0030053),
- The Wash and North Norfolk Coast SAC (UK0017075) (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water)),
- The Wash SPA (UK9008021), (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water))
- The Wash Ramsar site (UK11072), (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water))

As no residual discernible effects are anticipated upon the above Habitats Site, no in-combination effects are anticipated.

As a result, it is considered that the drought permit will not result in any likely significant nor residual effects upon the qualifying features of the aforementioned Habitats Sites.

5. INFORMATION FOR STAGE 2 APPROPRIATE ASSESSMENT

The Competent Authority is required to make an AA to determine whether the Plan alone or in-combination would have an adverse effect on the integrity of a Habitats Site where LSE has been identified. The information provided in this section is sufficient to enable the competent authority to complete their assessment.

The integrity of the site can be defined as the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified[19].

the condition of the underpinning SSSIs has been considered in the assessment to understand the baseline.

5.1 APPROPRIATE ASSESSMENT: ABBERTON RESERVOIR SPA

5.1.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables, **Table AN- 14**. The following qualifying features have been taken forward to the AA:

- A005 Great crested grebe (Non-breeding)
- A017 Great cormorant (Breeding)
- A036 Mute swan (Non-breeding)
- A050 Eurasian wigeon (Non-breeding)
- A051 Gadwall (Non-breeding)
- A052 Eurasian teal (Non-breeding)
- A056 Northern shoveler (Non-breeding)
- A059 Common pochard (Non-breeding)
- A061 Tufted duck (Non-breeding)
- A067 Common goldeneye (Non-breeding)
- A125 Common coot (Non-breeding)
- Waterbird assemblage (Non-breeding)

The Abberton Reservoir Ramsar site is designated for wintering gadwall, shoveler, and wigeon as well as wintering waterbird assemblages. As these are also designated within the Abberton Reservoir SPA, and the sites cover the same area, these two sites have been assessed as one.

Theoretical pathways for effects exist as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit through:

- potential surface water level drop-down during operation of the drought permit.
- potential groundwater levels drop-down during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.1.2 Site Summary

5.1.2.1 Site Description

Abberton Reservoir SPA/Ramsar site (centered on Ordnance Survey [OS] grid reference TL862948) covers 726.2ha and is a large storage reservoir owned by Essex and Suffolk water lying about four miles south of Colchester. It is the largest freshwater body in Essex and one of the most important reservoirs in Britain for wildfowl. It is outstandingly important as an autumn arrival point, moulting and wintering locality for wildfowl. About thirty thousand birds visit the reservoir annually including internationally important numbers of one species and nationally important numbers of twelve others. It is also one of a handful of sites in Britain where

[19] http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

Cormorants nest inland in trees. The reservoir is less than five miles from the coast and many birds move between it and nearby intertidal areas and grazing marshes along the Colne and Blackwater estuaries.

5.1.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.1.2.2.1 Coot Fulica atra, Non-breeding

The common coot is a member of the rail and crake bird family. The species is omnivorous, feeding primarily on plant matter such as shoots and seeds of aquatic and some terrestrial plants, algae, grasses and cereals. It also takes animal food such as worms, leeches, molluscs, shrimps, insects (adults and larvae) and spiders. When classified in 1991, this site supported a nationally important over-wintering population of common coot made up of 11,500 individuals representing 10% of the British population, at the time (1985/86 to 1989/90). The current population of this species overwintering within the site is estimated at 2,833 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a decrease of 75.4% for this species on this site. The current population level is still above the nationally important threshold. Coot is not listed on the SPA citation as an autumn passage species at Abberton, but in recent years annual peak numbers have generally occurred between August and October[20]. Within this SPA the principal habitats supporting this qualifying species are: Standing open water.

5.1.2.2.2 Cormorant Phalcrocorax carbo, Breeding

The great cormorant is a diving fish-eating bird. This site supports nationally important numbers of breeding cormorants during the summer months and when the SPA was classified in 1991 the site supported 360 pairs (this represented 5% of the total British breeding population). The population has declined since the SPA's classification, with a latest five-year peak mean of 161 pairs (2013-2017)[21]. In the 1980s Abberton Reservoir was the only site at which an inland breeding colony was established. This colony was unusual in Great Britain because the birds are nesting in trees inland, rather than on coastal cliff ledges or rocky islets. At the time of designation this colony was largest in the country. Between 1989 and 1994 another inland breeding colony was established at Walthamstow Reservoir on the outskirts of London near the border of Essex. Since then, further colonies have been established in and around Essex. As these new colonies have been established the population growth at Abberton Reservoir and other older sites has stabilised or declined. The birds here primarily feed in the estuarine waters of the Essex coast between the River Colne and the River Crouch. They do also use inland sites and are known to use gravel-pits, reservoirs, lakes and rivers. At this SPA and Ramsar site the principal habitats supporting this qualifying species include woodland (where the nesting sites are located in the trees along the north and south shores of the reservoir's central section) and standing open water.

5.1.2.2.3 Gadwall Mareca strepera, Non breeding

Gadwall require generally undisturbed, still, eutrophic waters that have a combination of open water and emergent vegetation[22]. Gadwall eat mostly submerged aquatic vegetation such as algae, grasses, rushes.

5.1.2.2.4 Goldeneye Bucephala clangula, Non-breeding

The goldeneye is a medium-sized diving duck. Goldeneyes typically forage underwater. They eat crustaceans, aquatic insects and small fish. They will also eat plant material, mainly seeds. Unlike pochard and tufted duck, goldeneye often feed in estuarine waters. When classified in 1991, this site supported a nationally important over-wintering population of goldeneye made up of 560 individuals representing 3% of the British population, at the time (1985/86 to 1989/90)[23]. The current population of this species overwintering within the site is estimated at 381 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a decrease of 31.9% for this species on this site. The current population level is still above the nationally important threshold. Within this SPA the principal habitat supporting these qualifying species is standing open water.

5.1.2.2.5 Great crested grebe Podiceps cristatus, Non-breeding

The great crested grebe is a diving bird mainly feeding on fish. When classified in 1991, this site supported a nationally important over-wintering population of great crested grebe made up of 180 individuals representing 2% of the British population, at the time (1985/86 to 1989/90)[23]. The current population of this species

[20] Waterbirds in the UK 2016/17 (Frost et al, 2018)
[21] Unpublished data from ESSEX & SUFFOLK WATER conservation staff
[22] Natural England Conservation Advice for Protected Sites, Abberton Reservoir SPA
[23] Abberton Reservoir citation, ENGLISH NATURE, 1991

overwintering within the site is estimated at 694 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, an increase of 285% for this species on this site. At this SPA the principal habitat supporting this qualifying species is standing open water.

5.1.2.2.6 Mute swan Cygnus olor, Non-breeding

Mute swans are the commonest Eurasian swan, and they eat aquatic vegetation, which their long necks equip them to take from the bed of the reservoir. They take the molluscs which cling to the vegetation and also eat small fish, frogs and worms. Typically, mute swans will graze big grassy fields and winter cereal crops. For this site, the winter cereals growing outside the SPA boundary are probably more important for the species than the grassland both within and outside the site boundary. When classified in 1991, this site supported a nationally important over-wintering population of mute swan made up of 500 individuals representing 3% of the British population, at the time (1985/86 to 1989/90)[23]. The current population of this species overwintering within the site is estimated at 162 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a decrease of nearly 68% for this species on this site. Traditionally, Abberton Reservoir has held large flocks of moulting swans during the post-breeding period[11]. The species was listed on the SPA citation as being a nationally important late summer passage visitor at this site. At the time of classification, the citation showed that the peak August count (for the five year period 1985-1989) for the species was 450 individuals. At the time this was 3% of the British population. The current peak August count (for the five-year period 2012-16) was 462 individuals. At this SPA the principal habitats supporting these qualifying species are: Standing open water, Improved grassland, Arable land.

5.1.2.2.7 Pochard Aythya ferina, Non-breeding

The common Pochard is a medium-sized diving duck. They feed by diving or dabbling, eating aquatic plants with some molluscs, aquatic insects and small fish. They often feed at night, and when diving for food may feed upside down. When classified in 1991, this site supported a nationally important over-wintering population of Pochard made up of 2,400 individuals representing 1% of the British population, at the time[23]. The current population of this species overwintering within the site is estimated at 1,648 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a decrease of just over 31% for this species on this site. The current population level is still above the nationally important threshold. Traditionally, Abberton Reservoir has held large flocks of moulting birds during the post-breeding period[24]. The species was listed on the SPA citation as being an important late summer passage visitor at this site. At the time of classification, the citation showed that the peak August count (for the five year period 1985-1989) for the species was 2,700 individuals. The recent peak August count (for the five-year period 2012-16) was 1,789 individuals. At this SPA the principal habitats supporting these qualifying species are: Standing open water.

5.1.2.2.8 Shoveler Spatula clypeata, Non-breeding

Shoveler prefer poorly drained treeless meadows interspersed with eutrophic shallow, stagnant freshwater pools and lakes, rivers with undisturbed creeks and muddy bottoms usually processing lush emergent and floating vegetation. As a result of its specialised filter-feeding methods, its habitat choice is therefore restricted[24]. Zooplankton is an important food source for the species and this is likely a primary food source at the site[25]. When classified in 1991, this site supported an internationally important over-wintering population of shoveler made up of 480 individuals representing 5% of the British population and 1% of the Northwest European population, at the time (1985/86 to 1989/90)[23]. The current population of this species overwintering within the site is estimated at 1,219 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a 154% increase for this species on this site. The species was listed on the SPA citation as being an important late summer passage visitor at this site. At the time of classification, the citation showed that the peak August count (for the five year period 1985-1989) for the species was 420 individuals. The recent peak August count (for the five-year period 2012-16) was 1,055 individuals. At this SPA the principal habitats supporting these qualifying species are: Standing open water, wet grassland.

5.1.2.2.9 Teal Anas crecca, Non-breeding

This dabbling duck is the smallest European duck. Overwintering teal mainly feed on the seeds of aquatic plants, grasses and sedges. When classified in 1991, this site supported a nationally important over-wintering population of teal made up of 2,200 individuals representing 2% of the British population, at the time (1985/86

[24] Wood, 2007

[25] 2019, Essex and Suffolk Water personal communication

to 1989/90)[24]. The current population of this species overwintering within the site is estimated at 4,987 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, an increase of over 126% for this species on this site. In fact, the population is nearing the internationally important threshold of 5,000. At this SPA the principal habitats supporting these qualifying species are: Standing open water, wet grassland.

5.1.2.2.10 Tufted duck Aythya fuligula, Non-breeding

The tufted duck is a medium-sized diving duck. The species is mainly carnivorous with animal material forming more than 80% of their diet[24]. The diet consists of molluscs, insects and some plants. When classified in 1991, this site supported a nationally important over-wintering population of tufted duck made up of 3,500 individuals representing 2% of the British population, at the time (1985/86 to 1989/90)[23].The current population of this species overwintering within the site is estimated at 1,733 individuals, based on a 5 year peak mean from 2012/13 to 2016/17, a decrease of 50.5% for this species on this site. The current population level is still above the nationally important threshold. The species was listed on the SPA citation as being an important late summer passage visitor at this site. At the time of classification, the citation showed that the peak August count (for the five year period 1985-1989) for the species was 2,700 individuals. At this SPA the principal habitats supporting these qualifying species are: Standing open water.

5.1.2.2.11 Waterbird assemblage, Non-breeding

When classified in 1991, this site supported an internationally important over-wintering waterfowl population made up of 34,000 individuals, at the time (1985/86 to 1989/90)[23]. The current population of this overwintering assemblage within the site is estimated at 27,327 individuals, based on a 5-year peak mean from 2012/13 to 2016/17, a decrease of 19.6% for the assemblage on this site. The main individual component species of the assemblage are listed below:

- Wigeon;
- Gadwall;
- Mute swan;
- Shoveler;
- Teal;
- Pochard;
- Tufted duck;
- Goldeneye;
- Coot;
- Pintail;
- Great crested grebe;
- Smew;
- Cormorant;
- Lapwing;
- Golden plover;
- Ruff.

5.1.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 14**, Abberton Reservoir SPA/Ramsar site is legally underpinned by one SSSI.

The condition of the units is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Abberton Reservoir SPA/Ramsar Site Improvement Plan (SIP)[26] and specifically associated with the qualifying features requiring AA:

[26] Natural England (2015). Site Improvement Plan: Abberton Reservoir. Site Improvement Plan: Abberton Reservoir - SIP001

- Siltation: Reduce the sediment load in reservoir inflow
- Planning general: Develop guidance on impacts of new development near wetland SPAs
- Changes in species distributions: Investigate reduction in numbers of breeding cormorants
- Water Pollution: Investigate potential impacts of changes in nutrient levels

5.1.3 Assessment of Effects

An assessment of effects against the relevant Supplementary advice to the conservation objectives (SACO) attributes and targets is provided in **Table 5-1**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 26**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

Table 5-1: AA against relevant attributes and targets taken from the SACO for Abberton Reservoir SPA and Ramsar site

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Breeding Species				
Cormorant (*Phalacrocora x carbo*); Breeding	Population abundance	Restore the size of the breeding population to a level which is above 360 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	The Abberton Reservoir SPA and is located within an approximate 12km radius of the Lower Colne source, additionally, part of the SPA lies within the hydrological ZoI for the Drought Permit. The Abberton Reservoir SPA is underpinned by the Abberton Reservoir SSSI which is designated for the same features as the SPA as well at standing open water and canals. The Abberton Reservoir SSSI is located within the SPA. **Population abundance, extent and distribution of supporting non-breeding habitats, and food availability** Cormorant are a diving fish-eating bird, which breed in woodland (where the nesting sites are located in the trees along the north and south shores of the reservoir's central section). Changes in flows during operation of the Lower Colne intake and river augmentation are unlikely to result in deteriorations in water quality as a result of the drought permit as the river augmentation will slightly increase the river flow, therefore it is unlikely that the drought permit could have adverse effects on food availability for Cormorant within the SPA. Additionally, given the hydrological impacts from the drought permit would be "minor" in the both the 'summer months' (May-November) and "minor" in the winter months (December-April) in Reach 2 (all other Reaches will have negligible impacts), it can be concluded that there is no potential for AEoI	No mitigation nor monitoring measures are deemed necessary with regards to Abberton Reservoir SPA and Ramsar site. The Plan alone is not anticipated to result in AEoI upon the SPA and Ramsar site.
	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): Standing open water: Between 185 ha and 670ha. Wet woodland adjacent to reservoir: Approximately 10.5ha		
	Food availability	Maintain the availability of key prey species (e.g. fish) at preferred prey sizes		
	Water depth	Maintain the availability of standing water of 2-10m deep.		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			of the Abberton Reservoir SPA site for cormorant as a result of changes to population abundance, population structure or extent and distribution of supporting habitats as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit alone. **Water depth and Water quality/ quantity** Changes in flow during operation of the drought permit is unlikely to cause increases in nutrient concentrations in the Abberton Reservoir SPA, as the river augmentation will result in a slight increase in river flow. As the anticipated impacts from water quality, specifically orthophosphate concentrations, is "minor (orthophosphate and dissolved oxygen only)" in 'summer months' (May-November) and "minor (orthophosphate and dissolved oxygen only)" in the winter months (December-April) in Reach 2 (all other reaches have negligible water quality impacts anticipated), the long-term implications on prey abundance and diversity may be negatively impacted. Given the potential 'minor' water quality impact, which will reduce to negligible in Reach 3 it can be concluded that there is no potential for AEoI of the Abberton Reservoir SPA as a result of changes to water quality/ quantity and water depth resulting from the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
Non-breeding species				
Coot (*Fulica atra*); Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 11,500 individuals over wintering whilst avoiding deterioration from	The Abberton Reservoir SPA and Ramsar site are located within an approximate 12km radius of the Lower Colne source, additionally, part of the SPA lies within the	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		their current level as indicated by the latest mean peak count or equivalent.	hydrological ZoI for the Drought Permit. The Abberton Reservoir SPA and Ramsar site are underpinned by the Abberton Reservoir SSSI which is designated for the same features as the SPA and Ramsar site as well at standing open water and canals. The Abberton Reservoir SSSI is located within the SPA and Ramsar site. **Population abundance, extent and distribution of supporting non-breeding habitats, and food availability** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians and small mammals. Changes in flows during operation of the Lower Colne intake and river augmentation are unlikely to result in deteriorations in water quality as a result of the drought permit as the river augmentation will slightly increase the river flow, therefore it is unlikely that the drought permit could have adverse effects on food availability for waterfowl assemblages within the SPA. Given the non-breeding status of the qualifying features and that the populations utilise the SPA more in the winter months when the hydrological impacts from the drought permit would be “minor” in Reach 2 (all other Reached will have negligible impacts), it can be concluded that there is no potential for AEoI of the Abberton Reservoir SPA and Ramsar site as a result of changes to population abundance, population structure or extent and distribution of supporting habitats resulting	
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185ha and 670ha		
	Water depth	Maintain the availability of standing water at optimal depth, typically: 1-3m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred prey including: *Mytilus, Dreissena polymorpha, caddis-fly larvae, Odonata, Lepidoptera*, beetles and bugs.		
Gadwall (*Mareca strepera*); Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 480 individuals overwintering and maintain the baseline of 110 individuals' passage whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred food plants; *Glyceria fluitans, Agrostis stolonifera, Chara, Potomageton, Ceratophyllum spp., Ruppia*		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water depth	Maintain the availability of standing water at optimal depth, typically: <0.25m	from the Lower Colne (Ardleigh Reservoir) Drought Permit. It should be noted that shoveler, although considered an over-wintering population, are also classified as a late summer passage visitor at the SPA and Ramsar site, this species feeds on zooplankton which is likely a primary food source at this site. Shoveler prefer poorly drained treeless meadows interspersed with eutrophic shallow, stagnant freshwater pools and lakes, rivers with undisturbed creeks and muddy bottoms usually processing lush emergent and floating vegetation. As previously mentioned, hydrological impacts from the drought permit would be "minor" in the 'summer months' (May-November), it is unlikely that this could have adverse effects on food availability and the supporting habitats for Shoveler, or have indirect impacts on population abundance and structure. Therefore, it can be concluded that there is no potential for AEoI of the Abberton Reservoir SPA site for Shoveler as a result of changes to population abundance, population structure or extent and distribution of supporting habitats as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit alone. **Water depth and Water quality/ quantity** Changes in flow during operation of the drought permit is unlikely to cause increases in nutrient concentrations in the Abberton Reservoir SPA/ Ramsar site, as the river augmentation will result in a slight increase	
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Goldeneye (*Bucephala clangula*) Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 560 individuals over wintering whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha.		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred prey including: *Trichoptera, chironomid* larvae, *Gammarus*, *Asellus.*		
	Water depth	Maintain the availability of standing water at optimal depth, typically: 2-4m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Great crested grebe (*Podiceps*	Population abundance	Maintain as appropriate the size of the non-breeding population at/to a size which is above the baseline of 180 individuals over wintering whilst avoiding deterioration from		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
cristatus), Non-breeding		their current level as indicated by the latest mean peak count or equivalent.	in river flow. As the anticipated impacts from water quality, specifically orthophosphate and dissolved oxygen concentrations, is 'minor' in the winter months at Reach 2, the long-term implications on macrophyte and macroinvertebrate abundance and diversity may be negatively impacted. As previously mentioned, there is potential for 'minor' hydrological impact as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit, this my impact the water quantity and depth within the SPA. Given the breeding status of the qualifying feature and the potential 'minor' water quality impact, it can be concluded that there is no potential for AEoI of the Abberton Reservoir SPA and Ramsar site as a result of changes to water quality/ quantity and water depth as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
	Food availability	Maintain high cover/abundance of preferred prey including: bleak, minnows, perch, roach, *Gobius spp*., prawns, shrimps.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha.		
	Water depth	Maintain the availability of standing water at optimal depth, typically: 1-5m.		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Mute swan (*Cygnus olor*), Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 500 individuals over wintering and maintain 450 individuals passage whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.	As previously stated, although considered an over-wintering population, are also classified as a late summer. Shoveler prefer poorly drained treeless meadows interspersed with eutrophic shallow, stagnant freshwater pools and lakes, rivers with undisturbed creeks and muddy bottoms usually processing lush emergent and floating vegetation. As previously mentioned, water quality impacts from the drought permit would be "minor (orthophosphate and dissolved oxygen only)" in the 'summer months' (May-November), this could have indirect impacts on the supporting habitats for Shoveler. As hydrological impacts in the summer months are considered to be 'minor' it is unlikely that	
	Food availability	Maintain high cover/abundance of preferred food sources including: Glyceria fluitans, Rorippa spp., Alopecurus geniculatus, Potamogeton, Callitriche, Myriophyllum, Chara spp.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature: Standing open water - Between 185 ha and 670 ha Arable land - 76ha within SPA boundary.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water depth	Maintain the availability of standing water at optimal depth, typically: <1m	there will be indirect impacts on supporting habitats as a result of changes to water quantity and depth. Therefore, it can be concluded that there is no potential for AEoI of the Abberton Reservoir SPA site for Shoveler as a result of changes to water quality, quantity and depth as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Pochard (*Aythya ferina*), Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 2400 individuals over wintering and restore 2700 individuals which are passage whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred prey including: *Chironomid larvae, caddis, Tubifex*)		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha		
	Water depth	Maintain the availability of standing water at optimal depth, typically: 2-6 m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Shoveler (*Spatula*	Population abundance	Maintain as appropriate the size of the non-breeding population at/to a size which is above the baseline of 480 individuals over wintering and maintain a baseline of 420		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
clypeata), Non-breeding		individuals passage whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred prey including: Crustaceans, caddisflies, diptera, beetles		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha Wet grassland, fen, marsh & swamp 6ha		
	Water depth	Maintain the availability of standing water at optimal depth, typically: <0.3m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Teal (*Anas crecca*), Non-breeding	Population abundance	Maintain as appropriate the size of the non-breeding population at/to a size which is above the baseline of 2220 individuals over wintering whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.		
	Food availability with supporting habitats	Maintain high cover/abundance of preferred prey including: Flies, caddisfly, beetles, bugs, hatching midges.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature Standing open water - Between 185 ha and 670 ha Wet grassland, fen, marsh & swamp - 6ha.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water depth	Maintain the availability of standing water at optimal depth, typically: <0.1m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
Tufted duck (*Aythya fuligula*), Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 3500 individuals over wintering and maintain 2700 individuals which are passage whilst avoiding deterioration from their current level as indicated by the latest mean peak count or equivalent.		
	Food availability with supporting habitats	Maintain high cover/abundance of preferred prey including: Dreissena polymorpha, Mytillus, Cardium spp, Chironomid larvae, Gammarus.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature Standing open water - Between 185 ha and 670ha.		
	Water depth	Maintain the availability of standing water at optimal depth, typically: 2-6m		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
	Assemblage abundance	Restore the overall abundance of the non-breeding assemblage to a level which is above 34,000 whilst avoiding deterioration		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		from its current level as indicated by the latest mean peak count or equivalent.		
Waterbird assemblage, Non-breeding	Extent and distribution of supporting non-breeding habitat	Maintain the extent and distribution of habitats which support the assemblage feature during all necessary stages (moulting, roosting, loafing, and feeding) of the non-breeding period. Standing open water: Between 185ha and 670ha; Wet grassland and fen, marsh and swamp: 6 ha Grassland: 72 ha; Arable land: 76 ha within SPA boundary at 2008 (although the assemblage species are more dependent on the larger areas of arable surrounding the site rather than that within it).		
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
	Quality of supporting non-breeding habitats	Maintain the structure, function and availability of the following habitats which support the main component species of the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non-breeding period: Standing open water, Wet grassland and fen, marsh and swamp, Improved Grassland Arable land.		
Wigeon (*Mareca penelope*), Non-breeding	Population abundance	Restore as appropriate the size of the non-breeding population at/to a size which is above the baseline of 8400 individuals whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water quality/ quantity	Where the supporting habitats of the SPA feature are dependent on surface water, maintain water quality and quantity at a standard which provides the necessary conditions to support the feature.		
	Food availability within supporting habitats	Maintain high cover/abundance of preferred food plants; *Polygonum,* Eleocharis, Rumex, Ranunculus.		
	Vegetation characteristics	Maintain the extent and distribution of predominantly short (<5 cm) swards in areas used for feeding.		
	Extent and distribution of supporting non-breeding habitat	Maintain the extent, distribution and availability of suitable habitat which supports the feature Standing open water - Between 185 ha and 670 ha Grassland - 72ha		

5.2 APPROPRIATE ASSESSMENT: BRECKLAND SAC

5.2.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables, **Table AN- 2.** The following qualifying features have been taken forward to the AA:

- H2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands
- H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
- H4030 European dry heaths
- H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); Alder woodland on floodplains*
- S1166 Great crested newt

Theoretical pathways for effect exist as a result of the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit through:

- potential groundwater levels drop-dawn during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.2.2 Site Summary

5.2.2.1 Site Description

Breckland SAC (centred on Ordnance Survey [OS] grid reference TL862948) covers 7,543.5ha and comprises a series of units across the Norfolk and Suffolk border. The highly variable soils generally consist of a very sandy free-draining mix of chalk, sand, silt, clay and flints, which show marked pH variation within short distances. This has a profound influence on the natural vegetation and has resulted in mosaics of heather-dominated heathland, acidic grassland and calcareous grassland that are unlike those of any other site. In many places there is a linear or patterned distribution of heath and grassland, arising from fossilised soil patterns that formed under peri-glacial conditions.

5.2.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.2.2.2.1 Inland dunes with open *Corynephorus* and *Agrostis grasslands*

Wangford Warren and adjoining parts of RAF Lakenheath are included in the Breckland SAC as the only occurrence of this habitat type in the UK. The SAC has one of the best-preserved systems of active inland sand dunes in the UK. The habitat type, which is in part characterised by the nationally rare grey hair-grass *Corynephorus canescens* occurring here at its only inland station, is associated with open conditions with active sand movement. The site shows the colonisation sequence from open sand to acidic grass-heath.

In the UK the vegetation of this habitat falls within National Vegetation Classification (NVC) types SD11 *Carex arenaria - Cornicularia aculeata* dune community, and SD12 *Carex arenaria - Festuca ovina - Agrostis capillaris* grassland, where the vegetation includes stands of grey hair-grass in inland situations.

Those plant species as well as the presence of European rabbit *Oryctolagus cuniculus* make a particularly important contribution to the necessary structure, function and/or quality of this habitat. Changes to natural soil properties and conditions may therefore affect the ecological structure, function and processes associated with habitat.

5.2.2.2.2 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation

The Breckland meres in Norfolk represent natural eutrophic lakes in the east of England. They are examples of hollows within glacial outwash deposits and are fed by water from the underlying chalk aquifer. Natural

fluctuations in groundwater tables mean that these lakes occasionally dry out. The flora is dominated by stonewort – pondweed *Characeae – Potamogetonaceae* associations.

These lakes have nutrient levels that are higher than those of oligotrophic, dystrophic or mesotrophic lakes, resulting in higher natural productivity, and are typically species-rich. However, many such lakes have been damaged by over-enrichment with nutrients, resulting in hypertrophic conditions and a reduction in species-richness. They are defined as aquifer-fed naturally fluctuating water bodies, and fluctuating meres are restricted to at least primarily, Stanford Training Area SSSI and East Wretham Heath SSSI.

Hydrology influences lake ecosystem functioning in two ways: determining residence time (flushing) and water level fluctuations. The meres are fed from the water table and water levels vary in relation to seasonal weather with a time delay of up to several months. Peak water levels tend to be around May but vary between sites and between years. Water levels tend to vary by up to 3m and the lack of a consistent shoreline results in a typical bowl-shaped or saucer-shaped form. Although, water abstraction from the water table could affect the hydrology of the meres, there seems to be no indication that there has been any increase in dry periods compared to the past.

5.2.2.2.3 European dry heaths

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content.

The dry heaths of Breckland SAC are representative of European dry heaths in East Anglia, developed under a semi-continental climate. Breckland SAC has an average annual precipitation of only 600mm, relatively hot summers and cold winters. Frosts can occur in any month of the year. The dry acidic heath of Breckland SAC represents H1 *Calluna vulgaris – Festuca ovina* heath in the SAC series. The sand sedge-dominated *Carex arenaria* sub-community (H1d) is typical of areas of blown sand, a very unusual feature of this location. The highly variable soils of Breckland SAC, with underlying chalk being largely covered with wind-blown sands, have resulted in mosaics of heather-dominated heathland, acidic grassland and calcareous grassland that are unlike those of any other site. In many places there is a linear or patterned distribution of heath and grassland, arising from fossilised soil patterns that formed under peri-glacial conditions. Breckland SAC is important for rare plants, such as perennial knawel *Scleranthus perennis* ssp. *prostratus*, and rare invertebrates.

The feature is largely centred on the Elveden Estate in Suffolk and the Stanford Training Area to Brettenham Heath area in Norfolk. The remaining heaths form relatively small, scattered fragments of formerly extensive areas. This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management.

5.2.2.2.4 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

This habitat feature comprises woodland area with veteran trees and dead wood categorised by the following NVC: W2a *Alnus glutinosa – Filipendula ulmaria; W5 Alnus glutinosa – Carex paniculate* woodland; W6 *Alnus glutinosa – Urtica dioica* woodland and W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum*.

This habitat is supported by surface and/or groundwater and therefore water quality and quantity are critical to maintain the habitat. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present.

5.2.2.2.5 Great crested newt

GCN is the largest native British newt. Newts require aquatic habitats for breeding. Eggs are laid singly on pond vegetation in spring, and larvae develop over summer to emerge in August – October, normally taking 2–4 years to reach maturity. Juveniles spend most time on land, and all terrestrial phases may range a considerable distance from breeding sites. Breeding sites are mainly medium-sized ponds, though ditches and other waterbody types may also be used less frequently. Ponds with ample aquatic vegetation (which is used for egg-laying) seem to be favoured. GCN do not require very high-water quality but are normally found in ponds with a circum-neutral pH. Broad habitat type varies greatly, the most frequent being pastoral and arable farmland, woodland, scrub, and grassland. There are also populations in coastal dunes and shingle structures. GCN can be found in rural, urban and post-industrial settings, with populations less able to thrive where there are high degrees of fragmentation.

The water-bodies in the SAC are confined to key population centres within the Stanford Training Area. Two previous surveys covering a large proportion of the waterbodies on the Stanford Training Area SSSI were

carried out in 1997/8 and 2010/12. The first survey found GCN present in 45 (35%) of the waterbodies, while in the second survey the occupancy rate had increased to 64 water bodies but the percentage remained the same as more waterbodies were sampled.

A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) did not identify previous European Protected Species Licence (EPSL) within the ZoI. A review of NBN Atlas[27] confirmed the presence of GCN within the ZoI, with multiple records since 2015.

5.2.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables, **Table AN- 2** Breckland SAC is legally underpinned by multiple SSSI[28]. Their condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Breckland SAC SIP[29] and specifically associated with the qualifying features requiring AA:

- Water pollution: review the findings from the investigation into elevated nutrient levels in the meres to ascertain whether a catchment scale approach is needed to remedy adverse condition.
- Changes in species distributions: implement comprehensive monitoring of rare, scarce vascular plants in Breckland SAC, implement habitat management and species recovery programmes with regards to lichen heath, investigate the apparent die-back of heather to determine causes, and identify potential remedies, and investigate decline of grey hair-grass *Corynephorus canescens* in two components of the SAC (i.e. in relation to inland sand dunes).

5.2.3 Assessment of Effects

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 27** and **Table AN- 28**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

An assessment of effects against the relevant Supplementary advice to the conservation objectives (SACO) attributes and targets is provided in **Table 5-2.**

[27] NBN Atlas - UK's largest collection of biodiversity information – accessed September 2025.

[28] Barnhamcross Common SSSI, Berner's Heath, Icklingham SSSI, Bridgham & Brettenham Heaths SSSI, Cavenham - Icklingham Heaths SSSI, Cranwich Camp SSSI, Deadman's Grave, Icklingham SSSI, East Wretham Heath SSSI, Field Barn Heaths, Hilborough SSSI, Foxhole Heath, Eriswell SSSI, Gooderstone Warren SSSI, Grime's Graves SSSI, Lakenheath Warren SSSI, RAF Lakenheath SSSI, Stanford Training Area SSSI, Thetford Golf Course & Marsh SSSI, Thetford Heaths SSSI, Wangford Warren and Carr SSSI, Weather and Horn Heaths, Eriswell SSSI and Weeting Heath SSSI

[29] Natural England (2015). Site Improvement Plan: Breckland. Site Improvement Plan: Breckland - SIP025

Table 5-2: AA against relevant attributes and targets taken from the SACO for Breckland SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
Inland dunes	Key structural, influential and/or distinctive species	Maintain, and where necessary restore at appropriate levels the presence and viability of the following typical species which are an integral and distinctive component of the qualifying habitat feature at this site: • The constant and preferential plants of the NVC community type which forms a key component of a SAC habitat that is present (SD11 *Carex arenaria - Cornicularia aculeata* dune community, SD12 *Carex arenaria - Festuca ovina - Agrostis capillaris* dune grassland) • Influential species: European rabbit *Oryctolagus cuniculus*	Inland dune habitat has been recorded within Wangford Warren and Carr SSSI and adjoining parts of RAF Lakenheath SSSI located within the ZoI. The features are regularly monitored as part of Natural England's (NE) SSSI Condition Assessments. Pressure from water abstraction is currently considered 'medium' risk within Wangford Warren and Carr SSSI. Impacts to groundwater level is considered moderate within Wangford Warren and Carr SSSI. Implementation of the drought permits may therefore result in AEoI upon the structure and composition of the inland dune feature. Mitigation measures should be implemented.	**Drought Level 1 measures:** • Need to define groundwater thresholds to trigger mitigation implementation during drought permit. **Drought Permit Implementation measures:** • Cessation rules to halt abstraction if groundwater levels deteriorate below acceptable levels. • Variable abstraction to allow occasional pulses of water throughout the system to aid in the flushing of pollutants and prevent stagnation. **Evaluation of mitigation measures:** • Differences in groundwater levels and walkover surveys before and after mitigation measure implementation. Baseline/ threshold development will be determined from Drought Level 1 monitoring and agreed between the EA, NE and AWS.
	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following NVC types listed above.		
	Vegetation: undesirable species	Maintain the frequency/cover of the following undesirable species within acceptable level and ensure they are not encouraged by changes in surface condition, soils, nutrient levels or changes to hydrology: *Calamagrostis epigejos*, *Chamerion angustifolium*, *Cirsium arvense*, *Cirsium vulgare*, *Plantago major*, *Rumex crispus*, *Rumex*		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
		obtusifolius, *Senecio jacobaea*, *Urtica dioica*		
Natural eutrophic lakes	Extent of the feature within the site	Maintain the extent of potential standing water within the fluctuating meres at 22ha.	Aquifer-fed naturally fluctuating water bodies, and fluctuating meres are located within Stanford Training Area SSSI and East Wretham Heath SSSI. Based on the groundwater assessment, moderate impacts are anticipated within Stanford Training Area SSSI while East Wretham Heath SSSI is located outside the ZoI. Implementation of the drought permits may therefore result in AEoI upon the natural eutrophic lake feature and mitigation measures should be implemented.	
	Key structural, influential and/or distinctive species	Maintain and where necessary restore the abundance of the species listed to enable each of them to be a viable component of habitat feature. The constant and preferential plants of the NVC community type which forms a key component of a SAC habitat that is present including; *Hydrocharition* species: *Stratiotes aloides*, *Lemna* spp. (not *L. minuta*), *Hydrocharis morsus-ranae, Riccia fluitans, Utricularia australis/vulgaris, Spirodela polyrhiza*. Associates include *Nuphar lutea, Nymphaea alba, Potamogeton natans, Butomus umbellatus, Callitriche spp*. Indicators of local distinctiveness including: critically endangered Norfolk Bladder Moss *Physcomitrium eurystomum*, and red listed species soft hornwort *Ceratophyllum submersum*.		
	Macrophyte community structure	Maintain maximum depth of plant colonisation during the wet phase. This will often be the maximum depth colonised by *Potamogeton* spp. Maintain characteristic zones of vegetation including aquatic zone,		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
		exposed mud and annual herb zone, and damp / dry inundation grassland.		
	Hydrology	At a unit level maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site.		
European dry heaths	Key structural, influential and/or distinctive species	Maintain the abundance of the typical species listed below to enable each of them to be a viable component of the habitat which in Breckland will include a combination of some of the following: *Calluna vulgaris, Genista anglica, Agrostis spp., Ammophila arenaria, Carex spp., Danthonia decumbens, Deschampsia flexuosa, Festuca spp., Nardus stricta, Galium saxatile, Hypochaeris radicata, Lotus corniculatus, Plantago lanceolata, Polygala serpyllifolia, Potentilla erecta, Rumex acetosella, Serratula tinctoria, Thymus praecox, Viola riviniana*. Fixed dune grassland: *Aira praecox, Corynephorus canescens, Phleum arenarium, Erodium cicutarium, Sedum acre*.	The feature is largely centred on the Elveden Estate in Suffolk and the Stanford Training Area to Brettenham Heath area in Norfolk. Based on groundwater assessment, moderate impacts are anticipated upon Stanford Training Area SSSI. Therefore, operation of the drought permit may result in AEoI upon European dry heath identified within Stanford Training Area SSSI. Therefore, mitigation measures and monitoring are required.	
	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following NVC types: H1: *Calluna vulgaris - Festuca ovina* heath		
	Vegetation: undesirable species	Maintain the frequency/cover of the following undesirable species		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
		to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread.		
Alluvial forests	Key structural, influential and/or distinctive species	Maintain the abundance of the typical species to enable each of them to be a viable component of the habitat. The constant and preferential plants of the NVC community type which forms a key component of the H91EO feature that is present: W5 *Alnus glutinosa* - *Carex paniculata* woodland W6 *Alnus glutinosa* - *Urtica dioica* woodland W7 *Alnus glutinosa* - *Fraxinus excelsior* - *Lysimachia nemorum* woodland	Alluvial forests have been identified, in the ZoI within Stanford Training Area SSSI and Thetford Golf Course SSSI, legally underpinning the SAC. Based on groundwater assessment, moderate impacts are anticipated upon Stanford Training Area SSSI, and minor impacts are anticipated upon Thetford Golf Course SSSI. Therefore, no AEoI are anticipated upon alluvial forests located within Thetford Golf Course SSSI. However, operation of the drought permit may result in AEoI upon alluvial forest identified within Stanford Training Area SSSI. Therefore, mitigation measures and monitoring are required.	
	Hydrology	At a site, unit and/or catchment level (as necessary, maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site.		
	Water quality /quantity	Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.		
Great crested newt	Population viability	Maintain the presence of GCN eggs in breeding ponds at a level which is likely to maintain the abundance of the population at or above its target level	Impacts during the summer have been screened out as the groundwater is not high enough where abstraction will cause GWDTE's conditions to decrease. However, groundwater level recovery expands behind the 6	
	Distribution of supporting habitat	Restore the distribution and continuity of the feature and its		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
		supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	months of operation of the permit operation (i.e. durations of impacts range from 14 months up to 33 months). GCN have been identified within Stanford Training Area SSSI where impacts have been assessed as moderate. Therefore, operation of the drought permits may result in lower water level within GCN breeding water bodies. Implementation of the drought permits may therefore result in AEoI upon GCN. Therefore, mitigation measures and monitoring are required.	
	Extent of supporting habitat	Restore the total extent of 64 waterbodies which support the feature.		
	Cover of macrophytes	Maintain a high cover of macrophytes, typically between 50-80%, within ponds.		
	Overall Habitat Suitability Index (HSI) score	For this SAC, maintain an overall GCN HSI score of no less than 0.8.		
	Permanence of ponds	Maintain the permanence of water within ponds present within the site		
	Presence of ponds	Restore the number or surface area of ponds present within the site.		
	Water quantity/quality	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.		
	Water quality	Maintain the quality of pond waters within the site as indicated by the presence of an abundant and diverse invertebrate community.		

5.3 APPROPRIATE ASSESSMENT: COLNE ESTUARY (MID-ESSEX COAST PHASE 2) SPA AND RAMSAR SITE

5.3.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 18.** The following qualifying features have been taken forward to the AA:

- A675 Dark-bellied brent goose (Non-breeding)
- A059 Common pochard (Breeding)
- A082 Hen harrier (Non-breeding)
- A137 Ringed plover (Breeding)
- A162 Common redshank (Non-breeding)
- A195 Little tern (Breeding)
- Waterbird assemblage (Non-breeding)

The Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site is designated for wintering dark-bellied brent goose, wintering redshank, wintering waterbird assemblages, saltmarsh, wetland invertebrate assemblages and wetland plant assemblages. As the ornithological features are also designated within the Colne Estuary (Mid-Essex Coast Phase 2) SPA and the two site cover the same area, these sites have been assessed as one. For features which are not designated within the SPA, a note has been added to clarify that the features are designated under the Ramsar site only.

Theoretical pathways for effect exist as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit through:

- potential surface water level drop-down during operation of the drought permit.
- potential groundwater levels drop-dawn during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.3.2 Site Summary

5.3.2.1 Site Description

The Colne Estuary SPA and Ramsar site covers an area of 2719.93 hectares, making it one of the smaller estuaries in East Anglia. The Colne Estuary SPA and Ramsar site is an integral component of the five phased Mid-Essex Coast SPAs, along with the Blackwater Estuary SPA, Dengie SPA, the Crouch and Roach Estuaries SPA, and Foulness SPA. The Mid-Essex Coast SPAs support a diverse range of species. These include internationally important populations of breeding birds, as well as internationally important assemblages of wintering waterfowl, present in both nationally and internationally important numbers. The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh.

The Colne Estuary SPA and Ramsar site lies adjacent to the Blackwater Estuary to the west with Dengie Flats to the south and opens out from Brightlingsea and Mersea Island on to the Essex coast, where marine areas are covered by the Outer Thames Estuary SPA. The site hosts a wide diversity of habitats with large stretches of mudflats fringed by saltmarsh on the upper shores. Deposition of shingle and shell banks, offshore islands and exposed gravel beds can be found along the tidal flats, particularly at Colne Point. Behind the sea-walls, important areas of coastal grassland occur. The surrounding terrestrial habitats - the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland - are also of high conservation interest.

The Colne Estuary is a site of significant international ornithological importance for overwintering birds, including raptors, geese, ducks and waders. The diversity of estuarine habitats provides good quality feeding areas for a diversity of waterbird species. At high tide, the birds roost along the shoreline and salt marsh fringe. The site is also important in summer for breeding birds.

At low tide, a vast expanse of intertidal mud is exposed from shore to shore. This enriched mud is a feeding ground for a variety of molluscs, crustaceans and worms, and encourages the growth of the green algae *Ulva* spp. at the seaward edges of the salting's. Wildfowl and waders amass to exploit this rich food

supply in large numbers. During severe winter weather the Colne Estuary (and the whole Mid-Essex Coast) can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by the relatively mild climate and the abundant food resources available in the site.

5.3.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.3.2.2.1 Dark-bellied brent goose *Branta bernicla bernicla* (Non-breeding)

Dark-bellied brent geese breed in Asian Arctic Russia and winter on the coasts of northwest Europe. When it was classified in 1994, this site supported an internationally important over-wintering population of 5,313 individuals (the mean of annual peak counts for 1987/88 to 1991/2) representing 5.9% of the British population and 3.1% of the total world population of this subspecies at the time. Up to date data can be obtained from the Wetland Bird Survey (WeBS): The number of dark-bellied brent geese has declined since classification. The most recent population counts report a wintering population of 3,021 individuals, based on a 5 year peak mean for 2012/13 – 2017/18, which represents a 43% decline. The birds roost in shallow, intertidal areas or on brackish and freshwater grazing marshes, and feed on intertidal plants such as Ulva species, seagrass *Zostera spp.* and some littoral plants. The species is mainly herbivorous although it may feed on animal matter such as fish eggs, worms, snails and amphipods. Historically, seagrass *Zostera spp* was a key food resource but its importance has declined as seagrass beds have disappeared from many areas. Weight loss incurred on migration is regained within a matter of days feeding on this easily digestible, high protein food source. Seagrass beds are still present at Foulness and sites linked to the Mid-Essex Coast SPAs in the Thames Estuary where they support some 40 to 50% of the UK population of dark-bellied brent geese in November, making south Essex the most important region in the country for this species during this season and brent geese appear to head there first, arriving after their long migratory flight from their breeding grounds, in the autumn before dispersing to other Mid-Essex coast SPAs including the Colne; in recent years the species has taken to grazing on coastal cultivated grasslands and winter cereal fields. The main sources of food are on and near the Colne Estuary SPA is algae *Ulva spp*. which form mats on the surface of the intertidal mudflats, saltmarsh vegetation, arable crops (primarily winter cereals; these are outside the SPA boundary but now provide a major food source now) and grazing marsh/coastal grassland which is partly within and partly outside the SPA boundary. On the Colne Estuary SPA, significant numbers of overwintering brent geese are normally present from early October to late March.

5.3.2.2.2 Common pochard *Aythya ferina* (Breeding)

When classified in the mid-1990s, the five Mid-Essex Coast SPAs supported a nationally important breeding population of pochard estimated at 15 pairs (the average peak mean between 1987 and 1991), representing 7% of the British breeding population at the time. The size of the breeding population on the Colne Estuary SPA is not stated but subsequent examination of Rare Breeding Birds Panel (RBBP) data indicates at least two pairs were present (the peak mean of records from the site for 1988 to 1991). Up to date data can be obtained upon request from RBBP. Pochard is a diving duck that feeds on aquatic plants and seeds, snails, small fish and insects. During the breeding season, pochard on the Colne Estuary SPA are usually found in areas of grazing marsh on waterbodies such as fleets, ponds, borrow dykes and wide ditches. Suitable waterbodies may be brackish or freshwater and have a combination of open water and abundant fringing aquatic plants such as sea club rush and common reed. The birds feed in the open water and nest in the cover provided by emergent and bankside vegetation. Data for summers when counts from the Langenhoe and Fingringhoe Marshes (on the MoD training area) are available suggest this large area of grazing marsh may hold 80% or more of the SPA's breeding population. Evidence of probable or confirmed breeding by one to three pairs has also been recorded occasionally from smaller areas of suitable habitat at East Mersea, Brightlingsea Marshes, Fingringhoe Wick and Colne Point. Pochard normally breed on the SPA from April to August. Small numbers are often present outside the breeding season on suitable waterbodies within and immediately adjacent to the site.

5.3.2.2.3 Hen harrier *Circus cyaneus* (Non-breeding)

When classified in the mid-1990s, the five Mid-Essex Coast SPAs supported a nationally important over-wintering population of hen harrier estimated at 19 individuals (the mean over the period 1987/88 to 1991/92) representing 2% of the British population. For the Colne Estuary SPA, the baseline population at classification was an estimated four individuals. Hen harriers overwintering in Essex appear to include both British and Continental breeders. On and around the Colne Estuary, overwintering hen harriers forage over a variety of open habitats, feeding on small mammals and birds. Individuals hunt over large areas and can easily visit a number of widely dispersed sites within one day. Their main foraging habitats on the SPA are coastal grazing marsh and saltmarsh but beyond the SPA boundary open farmland is also likely to be important - including

arable fields, pasture, and rough grass along seawalls and field and ditch margins. In addition, undisturbed coastal reedbeds and scrub are important for night-time roosts. On the SPA, the species is recorded most regularly from the larger and more remote areas of grazing marsh and saltmarsh such as Langenhoe Marsh and the Geedon Saltings on the west side of the estuary, and Colne Point on the east. Hen harriers normally occur on the SPA from September to April, though passage birds have sometimes been recorded in Essex as early as August and as late as early May.

5.3.2.2.4 Ringed plover *Charadrius hiaticula* (Breeding)

When classified in 1993, the Mid-Essex SPAs supported nationally important numbers of breeding ringed plover made up of 135 pairs (mean 1987 to 1991) representing 1% of the British breeding population. Up to date data can be obtained from the Essex Bird Report: The ringed plover subspecies *hiaticula* use this SPA to breed and over-winter. Breeding on site takes place between April and June, on beaches and also further inland in sand and gravel pits. Ringed plover feed on the upper shore zones of the intertidal boulder and cobble communities which support mussel beds. Breeding ringed plover use shingle, pebble and cockle shell beaches/spits for breeding, and saltmarsh and intertidal areas for feeding. The reduced breeding success at this site is likely to be partially related to the reduced availability of suitable nesting sites such as shingle, pebble and cockle shell beaches/spits, as the site is suffering the effects of coastal squeeze and is inundated at high tide due to erosion and sea level rise. Recreational disturbance is also a key factor in reducing nesting success in the site. Share Our Shores (SoS) is the public face of the Essex Beach-nesting Birds Group. An unaffiliated partnership of eNGO's, statutory bodies, councils and other stakeholders brought together to protect and enhance populations of beach-nesting birds (primarily little terns, ringed plovers and oystercatchers) on the Essex coast. Essex Wildlife Trust and RSPB are developing a targeted communications plan to address the issue of water-based and other recreational disturbance at their sites.

5.3.2.2.5 Common redshank *Tringa totanus* (Non-breeding)

When classified in 1994 this site supported an internationally important, over-wintering population of redshank made up of 1,252 individuals, representing 1.1% of the East Atlantic Flyway and 1.6% of the British population (based on the 5-year peak mean 1987/1988 to 1991/1992). Up to date data can be obtained from the Wetland Bird Survey (WeBS). Redshank use the Colne Estuary during the autumn and spring passage periods as well as over the winter; significant numbers are present from early August to late April. A much smaller breeding population stays on through the summer. Redshank feed on a variety of coastal aquatic invertebrates. They roost on the saltmarsh and also utilise grazing marsh in the site. During the non-breeding season the species feeds on insects, spiders and annelid worms, as well as molluscs and crustaceans, especially amphipods including Corophium spp. In the non-breeding season, the redshank is one of the most widespread waterbird species on the Colne. It uses a wide range of coastal habitats, including grazing marshes and their associated waterbodies, but the large majority of the non-breeding population forages on intertidal mudflats (especially the side channels on both sides of the estuary) and saltmarshes and roosts at high tide on higher areas of saltmarsh. Data indicate that high tide roosts around the east side of Mersea Island and further north along the west side of the estuary are particularly important for redshank.

5.3.2.2.6 Little tern *Sterna albifrons* (Breeding)

When classified in the mid-1990s, the five Mid-Essex Coast SPAs supported a nationally important breeding population of little tern; the average peak count over the period 1987 – 1991 was 73 pairs, which at this point was 3% of the British breeding population. For the Colne Estuary SPA, the baseline population at classification was an estimated 40 individuals. Up to date data can be obtained upon request from JNCC It should be noted that little tern populations are known to be functionally linked across the Mid-Essex Coast SPAs; the species may appear in any of these sites with suitable habitat in any given year. There is a high level of human disturbance in the Colne Estuary SPA which drives the selection of suitable and potentially ephemeral nesting sites. Conservation measures are being examined which aim to increase the breeding population at the site, including the use of wardens at nesting beaches and the use of coastal recharge projects. Ongoing vigilance and monitoring are necessary as part of a periodic review. Little terns generally favour sand and gravel for nesting, with a mosaic of sparse vegetation, as protection for their chicks. Shell banks are also used. All prefer a shallow, sloping shoreline, giving maximum protection against flooding. Little terns feed in shallow coastal waters mainly on small fish such as small herring and sand eel - they prefer fish that are thin in cross-section, as these are easier to grip than rounder fish - and also crustacea. These species are also likely to feed in marine waters outside the site. In addition to losses due to flooding, this species has suffered from predation (e.g. by black-headed gulls) and human disturbance on nesting grounds. Little tern populations in the Essex estuaries show large variations in the size of individual colonies from year to year. Projects such as the EU

LIFE+ Nature Little Tern Recovery Project are encouraging population numbers to stabilise and increase in the region. Share Our Shores (SoS) is the public face of the Essex Beach-nesting Birds Group. An unaffiliated partnership of eNGO's, statutory bodies, councils and other stakeholders brought together to protect and enhance populations of beach-nesting birds (primarily little terns, ringed plovers and oystercatchers) on the Essex coast. Essex Wildlife Trust and RSPB are developing a targeted communications plan to address the issue of water-based and other recreational disturbance at their sites.

5.3.2.2.7 Waterbird Assemblage, Non-Breeding

The Colne Estuary SPA supports an internationally important assemblage of waterbirds, especially in the non-breeding season. At classification in 1993 this assemblage was estimated at 30,687 birds (the 5 year peak mean for 1987/88 to 1991/92). The assemblage includes all native wildfowl and waders and other species covered by the Ramsar Conventions Strategic Framework definition of 'waterbird', such as divers, grebes, cormorants, herons and rails. Up to date data can be obtained from the Wetland Bird Survey (WeBS): At classification, the assemblage included internationally important numbers of dark-bellied brent goose *Branta bernicla bernicla* and redshank *Tringa totanus*, and nationally important numbers of a further 10 species: cormorant *Phalacrocorax carbo*, mute swan *Cygnus olor*, shelduck *Tadorna tadorna*, goldeneye *Bucephala clangula*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, sanderling *Calidris alba*, dunlin *Calidris alpina*, black-tailed godwit *Limosa limosa* and curlew *Numenius arquata*. Many of the assemblage species, including the large majority of waders, feed mainly or exclusively on exposed intertidal sediments and saltmarsh at low tide and congregate to roost at high tide on higher areas of saltmarsh or shingle. Data shows important concentrations of waders and wildfowl on the intertidal flats along both sides of the main estuary channel from the Mersea Flats and Colne Point at the estuary mouth, upstream to near Fingringhoe and Wivenhoe; and also along the wider side channels, particularly the Pyefleet Channel and Geedon and Brightlingsea Creeks. However, low tide distributions vary between species depending on their preferred feeding habitats. For example, sanderling and ringed plover favour areas near the estuary mouth at East Mersea and Colne Point, while black-tailed godwit and avocet are concentrated further up the estuary, and other species such as curlew and redshank are more evenly distributed. The key high tide roost sites, which regularly hold hundreds or thousands of birds at peak times, are scattered across the SPA mainly on the wider areas of saltmarsh or on islands. They occur on both sides of the main channel and in the wider side channels, from the estuary mouth north to near Wivenhoe and Fingringhoe. Inland of the intertidal zone, grazing marshes in the SPA - including their brackish to freshwater ditches, fleets and other water bodies - are valuable feeding areas for assemblage species. They are particularly important for several wildfowl species - particularly grazers like brent goose and wigeon - and for waders that often feed inland of seawalls, such as lapwing, golden plover and curlew. These and other species also use grazing marshes for resting and bathing and sometimes as high tide roost sites, particularly during high spring tides. The SPA's main areas of grazing marsh are: on the west side of the estuary: Langenhoe and Fingringhoe Marshes, and on Mersea Island at Cudmore Grove; and on the east side: Brightlingsea Marshes and Howlands Marsh. Assemblage species also use habitats in the local area but beyond the SPA boundary to feed and rest. This 'functionally linked land' mainly comprises open arable fields (particularly important for lapwing, golden plover and brent goose) but also includes lakes and ponds (most resulting from mineral extraction nearby) and additional areas of grazing marsh, mudflat and saltmarsh north of the SPA boundary upriver to the Hythe lagoons, and at Essex Wildlife Trust's Fingringhoe Wick managed realignment site, created in 2015. Diving waterbirds in the assemblage such as grebes, divers, seaducks and cormorant, mainly feed in the lower reaches of the estuary and off Mersea Island and Colne Point.

5.3.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**,**

Table AN- 18, Colne Estuary (Mid-Essex Coast Phase 2) Spa and Ramsar site is legally underpinned by multiple SSSI[30]. Their condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Colne Estuary (Mid-Essex Coast Phase 2) Spa and Ramsar site SIP[31] and specifically associated with the qualifying features requiring AA:

[30] Colne Estuary SSSI, Upper Colne Marshes SSSI

[31] Natural England (2014). Site Improvement Plan: Colne Estuary (Mid-Essex Coast Phase 2) Spa/Ramsar. Colne Estuary (Mid-Essex Coast Phase 2) Spa and Ramsar SIP

- Coastal squeeze: Investigate impacts on the site to inform development of remedial actions.
- Public Access/Disturbance: Analyse disturbance effects and manage public access to minimise disturbance.
- Fisheries: Commercial marine and estuarine: Where the assessments indicate management is required, introduce appropriate measures.
- Planning Permission: general: Collate and analyse data to develop guidance for the site.
- Changes in species distributions: Investigate site level and larger scale factors affecting the declining SPA species.
- Invasive species: Investigate impacts of Pacific oyster and other non-native marine species and identify possible management.
- Fisheries: Recreational marine and estuarine: Investigate the extent of impact of bait digging on the site.
- Fisheries: Commercial marine and estuarine: Introduce new byelaw for bottom towed gear and ensure compliance.
- Fisheries: Commercial marine and estuarine: Investigate and assess potential pressures from private and several fisheries and identify possible management.
- Invasive species: Monitor *Spartina anglica* and assess effects on interest features.
- Air Pollution: Investigate potential atmospheric nitrogen impacts.

5.3.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets is provided in **Table 5-3.**

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 26**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

Table 5-3: AA against relevant attributes and targets taken from the SACO for Colne Estuary (Mid-Essex Coast Phase 2) Spa and Ramsar site

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Breeding Species				
Little tern (*Sternula albifrons*), Breeding	Breeding population: abundance	Restore the size of the breeding population to a level which is 40 or above breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	The Colne Estuary (Mid-Essex Coast Phase 2) SPA is located within an approximate 8km radius of the Lower Colne source. The Colne Estuary (Mid-Essex Coast Phase 2) SPA is underpinned by the Colne Estuary SSSI (within 8km via hydrological pathways) and Upper Colne Marshes SSSI (within 5km via hydrological pathways). The Upper Clone Estuary SSSI partly overlaps with the hydrological ZoI. The Colne Estuary SSSIs is designated for 16 features including seven non-breeding bird aggregations (also designated under the SPA), one breeding bird aggregation (Little Tern), three saltmarsh communities and morphologies, invertebrate, vascular plant and outstanding dragonfly assemblages, quaternary of the Thames and strandline communities. The Upper Colne Marshes SSSI is designated for lowland ditch systems and vascular plant assemblages. The hydrological impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter.	No mitigation nor monitoring measures are deemed necessary with regards to Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site. The drought permit alone is not anticipated to result in AEoI upon the SPA and Ramsar site.
	Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season	Restore the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding) to: Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); Intertidal sand and muddy sand (23.19 ha); and Water column.		
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. *crustacea, annelids, sandeel, herring, clupeidae*) at preferred sizes.		
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95% of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.	• Reach 2: Minor in summer and minor in winter. • Reach 3: negligible in summer and winter. The water quality impacts assessment for the River Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor (Orthophosphate and dissolved oxygen only) in summer and winter. • Reach 3: negligible in summer and winter. **Population abundance, extent and distribution of supporting breeding habitats, and food availability** Little tern, pochard and ringed plover feed on a range of food sources including macrophytes, seeds, invertebrates and small fish. Changes in flows during operation of the Lower Colne intake and river augmentation are unlikely to result in deteriorations in water quality as a result of the drought permit as the river augmentation will slightly increase the river flow, therefore it is unlikely that the drought permit could have adverse effects on food availability for food availability for little tern, pochard and ringed plover breeding	
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
Pochard (*Aythya ferina*), Breeding	Breeding population: abundance	Maintain the size of the breeding population at a level which is above 2 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season	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):		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		Coastal reedbeds (10.69 ha); Freshwater and coastal grazing marsh (508.16 ha); Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); Intertidal mud (974.48 ha); Intertidal sand and muddy sand (23.19 ha); and Water column.	assemblages of the SPA and Ramsar site. Given the breeding status of the qualifying features the populations will utilise the SPA more in the summer months (April-August for little tern and pochard and April-September for ringed plover) when the hydrological impacts from the drought permit would be "minor" in Reach 2 (all other Reached will have negligible impacts). The Colne Estuary SSSI and the Upper Colne Marshes SSSI may experience habitat deterioration due to hydrological impacts. However, the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site as well at the Colne Estuary SSSI and the Upper Colne Marshes SSSI are largely influenced by tidal activity, where the upper tidal limit is located upstream of the SPA, Ramsar site and SSSIs resulting in considerable mixing of freshwater and saline water prior to reaching the Habitats Sites downstream. As these minor and short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer to the SPA and Ramsar site than Reach 2, no significant changes are anticipated. It can therefore be concluded that there is no potential for AEoI of the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar	
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. *chironomid larvae, caddis, Tubifex, Chara, Nitella, Potamogeton spp., Myriophyllum*) at preferred prey sizes.		
	Supporting habitat: hydrology/flow within standing water	Maintain the stability of standing water levels in order to prevent flooding of nests.		
	Supporting habitat: water area	Maintain the number of waterbodies of optimal size (typically >6 ha).		
	Supporting habitat: water depth	Maintain the availability of standing water of optimal depth, typically 2-6 m deep.		
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.	site as a result of changes to population abundance, population structure or extent and distribution of supporting habitats due to the Lower Colne (Ardleigh Reservoir) Drought Permit alone. **Water quality** Changes in flow during operation of the drought permit is unlikely to cause increases in nutrient concentrations in the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site. Given the breeding status of the qualifying features the populations will utilise the SPA more in the summer months when the water quality impacts from the drought permit would be "minor (orthophosphate and dissolved oxygen only)" in Reach 2 (all other Reaches will have negligible impacts). However, the Colne Estuary (Mid- Essex Coast Phase 2) SPA and Ramsar site is largely influenced by tidal activity, where the upper tidal limit is located upstream of the SPA and Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the SPA and Ramsar site downstream. As these 'minor' and short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer to the SPA and Ramsar	
Ringed plover (*Charadrius hiaticula*), Breeding	Breeding population: abundance	Restore the size of the breeding population to a level which is above 53 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season	Restore the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding) to: Atlantic salt meadows (815.20 ha); Freshwater and coastal grazing marsh (508.16 ha); Intertidal biogenic reef: mussel beds (9.29 ha); Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); Intertidal mud (974.48 ha); and Intertidal sand and muddy sand (23.19 ha).		
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. Invertebrates, marine worms, crustaceans and molluscs) at preferred sizes.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.	site than Reach 2, no significant changes are anticipated. It can therefore be concluded that there is no potential for AEoI of the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site as a result of changes to water quality due to the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
	Supporting habitat: water quality - contaminants			
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
Non-breeding species				

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding	Non-breeding population: abundance	Restore the size of the non-breeding population to a level which is above 5,315 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	The Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site is located within an approximate 8km radius of the Lower Colne source. The hydrological impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor in summer and winter. • Reach 3: negligible in summer and winter. The water quality impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor (Orthophosphate and dissolved oxygen only) in summer and winter. • Reach 3: negligible in summer and winter. **Population abundance, extent and distribution of supporting breeding habitats, and food availability** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians, fish and intertidal plant. and river augmentation are	No mitigation nor monitoring measures are deemed necessary with regards to Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site. The drought permit alone is not anticipated to result in AEoI upon the SPA and Ramsar site.
	Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	Maintain the extent, distribution and availability 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) at: Atlantic salt meadows (815.20 ha); Freshwater and coastal grazing marsh (508.16 ha); Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); Intertidal mud (974.48 ha); Intertidal sand and muddy sand (23.19 ha); and Water column.		
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. *Enteromorpha, Ulva lactuca, Spergularia, Puccinellia, Triglochin, Aster trifolium, Plantago, Salicornia spp, Agrostis stolonifera, Lolium perenne, Trifolium repens*) at preferred sizes.		
	Supporting habitat: hydrology/flow within intertidal	Maintain the availability of fresh water on mudflats within feeding and resting areas.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.	unlikely to result in deteriorations in water quality as a result of the drought permit as the river augmentation will slightly increase the river flow, therefore it is unlikely that the drought permit could have adverse effects on food availability for waterfowl assemblages of the SPA and Ramsar site. Given the non-breeding status of the qualifying features the populations will utilise the SPA more in the winter months when the hydrological impacts from the drought permit would be "minor" in Reach 2 (all other Reached will have negligible impacts). The Colne Estuary SSSI and the Upper Colne Marshes SSSI could experience habitat deterioration due to hydrological changes. However, the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site and the Colne Estuary and the Upper Colne Marshes SSSIs are largely influenced by tidal activity, where the upper tidal limit is located upstream of the Habitats Sites resulting in considerable mixing of freshwater and saline water prior to reaching the SPA and Ramsar site downstream. As these minor and short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer	
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Hen harrier (*Circus cyaneus*), Non-breeding	Non-breeding population: abundance	Restore the size of the non-breeding population to a level which is at least four individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	to the SPA, Ramsar site and SSSIs than Reach 2, no significant changes are anticipated alone. It can therefore be concluded that there is no potential for AEoI of the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site as a result of changes to population abundance, population structure or extent and distribution of supporting habitats due to the Lower Colne (Ardleigh Reservoir) Drought Permit alone. **Water quality** Changes in flow during operation of the drought permit is unlikely to cause increases in nutrient concentrations in the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site. Given the non-breeding status of the qualifying features the populations will utilise the SPA more in the winter months when the water quality impacts from the drought permit would be "minor" in Reach 2 (all other Reaches will have negligible impacts). However, the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site is largely influenced by tidal activity, where the upper tidal limit is located upstream of the SPA and Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the SPA and Ramsar site downstream. As these minor	
	Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	Maintain the extent, distribution and availability 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) at: Atlantic salt meadows (815.20 ha); Coastal reedbeds (10.69 ha); Freshwater and coastal grazing marsh (508.18 ha); Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); and Intertidal sand and muddy sand (28.19 ha).		
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. mammals, birds) at preferred sizes (eg. pipits to gamebirds; voles to young rabbit size).		
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.	and short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer to the SPA and Ramsar site than Reach 2, no significant changes are anticipated. It can therefore be concluded that there is no potential for AEoI of the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site as a result of changes to water quality due to the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
Redshank (*Tringa totanus*), Non-breeding	Non-breeding population: abundance	Maintain the size of the non-breeding population at a level which is above 1,252 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	Maintain the extent, distribution and availability 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) at: Atlantic salt meadows (815.20 ha); Freshwater and coastal grazing marsh (508.18 ha); Intertidal biogenic reef: mussel beds (9.29 ha); Intertidal coarse sediment (7.74 ha); Intertidal mixed sediments (10.78 ha); Intertidal mud (974.49 ha); and Intertidal sand and muddy sand (28.19 ha).		
	Supporting habitat: food availability (bird)	Maintain the distribution, abundance and availability of key food and prey items (eg. earthworm, leatherjacket, grassland/marsh invertebrates, *Hydrobia, Macoma, Corophium, Nereis*) at preferred sizes.		
	Supporting habitat: hydrology/flow within grassland (marsh)	Maintain water availability within feeding areas to maintain		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		moderately high water tables that provide shallow surface water.		
	Supporting habitat: hydrology/flow within intertidal	Maintain the availability of fresh water on mudflats within feeding and resting areas.		
	Supporting habitat: water depth	Maintain the availability of standing water of 1-5 cm deep.		
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
Waterbird assemblage, Non-breeding	Assemblage of species: abundance	Maintain the overall abundance of the assemblage at a level which is above the 30,687 included on the SPA Citation whilst avoiding deterioration from its current level as indicated by the latest peak mean count or equivalent.		
	Assemblage of species: diversity	Maintain the species diversity of the bird assemblage.		
	Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	Maintain the extent, distribution and availability 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).		
	Supporting habitat: quality of supporting non-breeding habitat	Maintain the structure, function and availability of the following habitats which support the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non-breeding period.		
	Supporting habitat: water quality - contaminants	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - dissolved oxygen	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥ 5.7 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - nutrients	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting habitat: water quality - turbidity	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.		
Ramsar site specific features: Saltmarsh; Wetland invertebrate assemblages; Wetland plant assemblages	Conservation Objectives not available for this site[32]	Conservation Objectives not available for this site	The hydrological impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows:	No mitigation nor monitoring measures are deemed necessary with regards to Colne Estuary (Mid-Essex Coast Phase 2 Ramsar site. The drought permit

[32] Natural England Conservation Advice for Protected Sites – Colne Estuary (Mid-Essex Coast Phase 2) Ramsar Designated Sites View

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			• Reach 1: negligible in summer and winter. • Reach 2: Minor in summer and minor in winter. • Reach 3: negligible in summer and winter. The water quality impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor (Orthophosphate and dissolved oxygen only) in summer and winter. • Reach 3: negligible in summer and winter. Changes in flows during operation of the Lower Colne intake and river augmentation are unlikely to result in increases in nutrient concentrations in the Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site. Additionally, the Colne Estuary (Mid- Essex Coast Phase 2) Ramsar site is largely influenced by tidal activity, where the upper tidal limit is located upstream of the Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the Ramsar site downstream. As these 'minor' and short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer	alone is not anticipated to result in AEoI upon the Ramsar site.

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			to the Ramsar site than Reach 2, no significant changes are anticipated. It can therefore be concluded that there is no potential for AEoI of the Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site as a result of changes to water quality due to the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	

5.4 APPROPRIATE ASSESSMENT: ESSEX ESTUARIES SAC

5.4.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables, **Table AN- 3.** The following qualifying features have been taken forward to the AA:

- H1130 Estuaries
- H1140 Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats
- H1310 Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand
- H1320 Spartina swards (Spartinion maritimae); Cord-grass swards
- H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- H1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi); Mediterranean saltmarsh scrub
- H1110 Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks

Theoretical pathways for effect exist as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit through:

- potential surface water level drop-down during operation of the drought permit.
- potential groundwater levels drop-down during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.4.2 Site Summary

5.4.2.1 Site Description

This is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach rivers. Essex Estuaries contains a very wide range of characteristic marine and estuarine sediment communities and some diverse and unusual marine communities in the lower reaches, including rich sponge communities on mixed, tide-swept substrates. Subtidal areas have a very rich invertebrate fauna, including the reef-building worm *Sabellaria spinulosa*, the brittlestar *Ophiothrix fragilis*, crustaceans and ascidians.

There are extensive intertidal mudflats and sandflats in estuaries and at Dengie Flats and Maplin Sands. The area includes a wide range of sediment flat communities, from estuarine muds, sands and muddy sands to fully saline, sandy mudflats with extensive growths of eelgrass *Zostera spp*. on the open coast. Glasswort *Salicornia spp*. saltmarsh forms an integral part of the transition from the extensive and varied intertidal mud and sandflats through to upper salt meadows. The area of pioneer marsh includes gradation into extensive cord-grass *Spartina spp*. swards, including the most extensive remaining stand of the native small cord-grass *Spartina maritima* in the UK and possibly in Europe at Foulness Point. Other smaller stands are found elsewhere in the estuary complex, notably in the Colne estuary, where it forms a major component of the upper marsh areas.

Extensive upper saltmarshes remain, including Atlantic salt meadows with floristic features typical of this part of the UK. Golden samphire *Inula crithmoides* is a characteristic species of these marshes, occurring both on the lower marsh and on the drift-line. Mediterranean saltmarsh scrub occurs principally as a strandline community or at the foot of sea-walls. The local variant of this vegetation, which features sea-lavenders *Limonium spp*. and sea-heath *Frankenia laevis*, occurs at one location, Colne Point.

5.4.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.4.2.2.1 Estuaries

This is a large estuarine site in south-east England, and is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach rivers and is important as an extensive area of contiguous estuarine habitat. Essex Estuaries contains a very wide range of characteristic marine and estuarine sediment communities and some diverse and unusual marine communities in the lower reaches, including rich sponge communities on mixed, tide-swept substrates. Sublittoral areas have a very rich invertebrate fauna, including

the reef-building worm *Sabellaria spinulosa*, the brittlestar *Ophiothrix fragilis*, crustaceans and ascidians. The site also has large areas of saltmarsh and other important coastal habitats.

5.4.2.2.2 Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

Essex Estuaries represents the range of variation of this habitat type found in south-east England and includes the extensive intertidal mudflats and sandflats of the Colne, Blackwater, Roach and Crouch estuaries, Dengie Flats and Maplin Sands. The area includes a wide range of sediment flat communities, from estuarine muds, sands and muddy sands to fully saline, sandy mudflats with extensive growths of eelgrass Zostera spp. on the open coast. The open coast areas of Maplin Sands and Dengie Flats have very extensive mudflats and an unusually undisturbed nature. Maplin Sands is particularly important for its large, nationally-important beds of dwarf eelgrass *Zostera noltei* and associated animal communities.

5.4.2.2.3 Salicornia and other annuals colonizing mud and sand

Glasswort *Salicornia spp*. saltmarsh in the Essex estuaries on the east coast of England forms an integral part of the transition from the extensive and varied intertidal mud and sandflats through to upper salt meadows. Although the saltmarshes in this area are generally eroding, secondary pioneer communities appear as a precursor to erosion on the seaward edge of degraded mid-marsh communities. The area of pioneer marsh includes gradation into extensive cord-grass *Spartina spp*.

5.4.2.2.4 Spartina swards *Spartinion maritimae*

The most extensive remaining stand of the native small cord-grass *Spartina maritima* in the UK and possibly in Europe is found in the Essex Estuaries. The stand is located at Foulness Point and covers approximately 0.17 ha. Other smaller stands are found elsewhere in the estuary complex, notably in the Colne estuary, where it forms a major component of the upper marsh areas.

5.4.2.2.5 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*

Although the saltmarshes in this area are generally eroding, extensive salt meadows remain and Essex Estuaries represents Atlantic salt meadows in south-east England, with floristic features typical of this part of the UK. Golden samphire *Inula crithmoides* is a characteristic species of these marshes, occurring both on the lower marsh and on the drift-line. It represents a community of south-east England also found to the south in mainland Europe.

5.4.2.2.6 Mediterranean and thermo-Atlantic halophilous scrubs Sarcocornetea fruticose

In this complex of estuarine marshes on the east coast of England the occurrence of Mediterranean and thermo-Atlantic *halophilous* scrubs is currently artificially restricted by sea-walls. It now occurs principally as a strandline community or at the foot of sea-walls. Recent managed retreat schemes offer the prospect of future expansion of the habitat type. The local variant of this vegetation, which features sea-lavenders *Limonium spp*. and sea-heath *Frankenia laevis*, occurs only at Colne Point.

5.4.2.2.7 Sandbanks which are slightly covered by sea water all the time

Sandbanks which are slightly covered by sea water all the time are comprised of sandy sediments that are permanently covered by shallow sea water. This feature can support a range of communities which are largely determined by sediment type together with a variety of other physical, chemical and hydrographic factors[33] This feature within the Essex Estuaries SAC comprises two subfeatures; subtidal coarse sediment, subtidal sands and subtidal seagrass beds.

[33] Joint Nature Conservation Committee (JNCC), 2015

5.4.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 3**, Essex Estuaries SAC is legally underpinned by several SSSI[34]. Their condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Essex Estuaries SAC SIP[35] and specifically associated with the qualifying features requiring AA:

- Coastal squeeze: Investigate impacts on the site to inform development of remedial actions.
- Public Access/Disturbance: Analyse disturbance effects and manage public access to minimise disturbance.
- Fisheries: Commercial marine and estuarine: Where the assessments indicate management is required, introduce appropriate measures.
- Planning Permission: general: Collate and analyse data to develop guidance for the site.
- Changes in species distributions: Investigate site level and larger scale factors affecting the declining SPA species.
- Invasive species: Investigate impacts of Pacific oyster and other non-native marine species and identify possible management.
- Fisheries: Recreational marine and estuarine: Investigate the extent of impact of bait digging on the site.
- Fisheries: Commercial marine and estuarine: Introduce new byelaw for bottom towed gear and ensure compliance.
- Fisheries: Commercial marine and estuarine: Investigate and assess potential pressures from private and several fisheries and identify possible management.
- Invasive species: Monitor *Spartina anglica* and assess effects on interest features.
- Air Pollution: Investigate potential atmospheric nitrogen impacts.

5.4.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets is provided in **Table 5-4**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment, **Table AN- 26**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[34] Blackwater Estuary SSSI, Colne Estuary SSSI, Crouch and Roach Estuaries SSSI, Dengie SSSI, Foulness SSSI

[35] Natural England (2014). Site Improvement Plan: Essex Estuaries SAC. Essex Estuary SAC.pdf

Table 5-4: AA against relevant attributes and targets taken from the SACO for Essex Estuaries SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range and continuity of the habitat and its natural transitions within saltmarsh types and to other habitats seaward and landward.	The Essex Estuaries SAC is located within an approximate 8km radius via hydrological connection from the existing source. Atlantic salt meadows, Estuaries, Mediterranean and thermos-Atlantic halophilous scrubs, Mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sand, Sandbanks which are slightly covered by sea water all the time and Spartina swards are all water dependant features of the SAC. The Essex Estuaries SAC is underpinned by seven SSSI, the closest to the extraction point being the Upper Colne Marshes SSSI located within an approximate 5km radius via hydrological pathways and partly overlaps with the hydrological ZoI. The Upper Colne Marshes SSSI is designated for lowland ditch systems and vascular plant assemblages. The hydrological impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor in summer and winter.	No mitigation nor monitoring measures are deemed necessary with regards to Essex Estuaries SAC. The drought permit alone is not anticipated to result in AEoI upon the SAC.
	Structure and function (including its typical species): key structural, influential and distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature		
	Structure and function: vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type (s)		
	Supporting processes: morphological setting	Maintain the morphological setting of the habitat within the wider estuarine and coastal system.		
	Supporting processes: sedimentary processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation and topography of the marsh surface.		
	Supporting processes: water quality (habitat)	Where the feature is dependent on estuarine water, ensure water quality and quantity is maintained at a standard that provides the necessary conditions to support the feature.		
Estuaries	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of estuary communities.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	• Reach 3: negligible in summer and winter. The water quality impacts assessment for the Lower Colne (Ardleigh Reservoir) EAR within Appendix A predicted as follows: • Reach 1: negligible in summer and winter. • Reach 2: Minor (Orthophosphate and dissolved oxygen only) in summer and winter. • Reach 3: negligible in summer and winter. As these minor short-term changes are anticipated to reduce to negligible in Reach 3, which is further downstream and therefore closer to the SAC and SSSIs than Reach 2, no significant changes are anticipated. Additionally, the Essex Estuaries SAC and underpinning SSSIs are largely influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. As a result, any hydrological or water quality changes are likely to be naturally mitigated by the tide. Therefore, there is anticipated to be no AEoI of the Essex Estuaries SAC as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit alone.	
	Structure: freshwater sources	Maintain the natural freshwater flow / volume into the estuary.		
	Structure: habitat zonation	Maintain the estuary zonation, which is affected by both changes in salinity gradient and tides in the estuary from river to sea (horizontally) and with shore height (vertically) from terrestrial to subtidal.		
	Structure: sediment movement, sources and sinks	Maintain the sediment regime and budget within the estuary, including sediment sources, sinks and movement.		
	Structure: water density	Maintain the natural water density or gradient across the feature (and each of its subfeatures).		
	Supporting processes: water quality - contaminants (habitat)	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - dissolved oxygen (habitat)	Maintain the dissolved oxygen (DO) concentration at levels equating to Good Ecological Status (specifically ≥ 4.0 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - nutrients (habitat)	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - turbidity (habitat)	Maintain natural levels of turbidity (eg concentrations of suspended sediment, particulates, plankton and other material) across the habitat.		
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range of the habitat and natural transitions within saltmarsh types and to other habitats seaward and landward, and do not cause fragmentation of existing stands.		
	Supporting processes: sediment nutrient status and nutrient cycling	Maintain both the sediment nutrient status to within typical values for the habitat and the processes that sustain effective nutrient cycling by the saltmarsh feature.		
	Supporting processes: water quality (habitat)	Where the feature is dependent on estuarine water, ensure water quality and quantity is maintained at a standard that provides the necessary conditions to support the feature.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Mudflats and sandflats not covered by seawater at low tide	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of mudflat and sandflat communities.		
	Supporting processes: physico-chemical properties (habitat)	Maintain the natural physico-chemical properties of the water.		
	Supporting processes: water quality - contaminants (habitat)	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - dissolved oxygen (habitat)	Maintain the dissolved oxygen (DO) concentration at levels equating to Good Ecological Status (specifically ≥ 4.0 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - nutrients (habitat)	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - turbidity (habitat)	Maintain natural levels of turbidity (eg concentrations of suspended		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		sediment, plankton and other material) across the habitat.		
Salicornia and other annuals colonising mud and sand	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range of the habitat and natural transitions within saltmarsh types and to other habitats seaward and landward.		
	Supporting processes: sediment nutrient status and nutrient cycling	Maintain both the sediment nutrient status to within typical values for the habitat and the processes that sustain effective nutrient cycling by the saltmarsh feature.		
	Supporting processes: water quality (habitat)	Where the feature is dependent on surface water and / or groundwater, ensure water quality and quantity is maintained at a standard that provides the necessary conditions to support the feature.		
Sandbanks which are slightly covered by sea water all the time	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of subtidal sandbank communities.		
	Supporting processes: energy / exposure	Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure does not cause alteration to the biotopes, and stability, across the habitat.		
	Supporting processes: physico-chemical properties (habitat)	Maintain the natural physico-chemical properties of the water.		
	Supporting processes: sediment movement and hydrodynamic regime (habitat)	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting processes: water quality - contaminants (habitat)	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - dissolved oxygen (habitat)	Maintain the dissolved oxygen (DO) concentration at levels equating to Good Ecological Status (specifically ≥ 4.0 mg L-1 (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - nutrients (habitat)	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data.		
	Supporting processes: water quality - turbidity (habitat)	Maintain natural levels of turbidity (eg concentrations of suspended sediment, plankton and other material) across the habitat.		
Spartina swards (*Spartinion maritimae*)	Distribution of the feature, including associated transitional habitats, within the site	Maintain the range of the habitat including natural transitions with other saltmarsh types.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Supporting processes: sedimentary processes	Maintain the sedimentary processes (suspended sediment, sediment transfer, etc) that sustain the elevation and topography of the marsh surface.		
	Supporting processes: water quality (habitat)	Where the feature is dependent on surface water and / or groundwater, ensure water quality and quantity is maintained at a standard that provides the necessary conditions to support the feature.		
	Supporting processes: sediment nutrient status and nutrient cycling	Maintain both the sediment nutrient status to within typical values for the habitat and the processes that sustain effective nutrient cycling by the saltmarsh feature.		

5.5 APPROPRIATE ASSESSMENT: NENE WASHES SAC

5.5.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 6**. The following qualifying features have been taken forward to the AA:

- S1149 Spined loach

Theoretical pathways for effect exist as a result of the River Nene (Pitsford Water) and River Nene (Rutland Water) Drought Permits through:

- potential water flow reduction during operation of the drought permit operation.
- potential deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation following the operation of the drought permit.

5.5.2 Site Summary

5.5.2.1 Site Description

Nene Washes SAC (centred on Ordnance Survey [OS] grid reference TL302990) covers 82.57ha and comprises Moreton's Leam, a large drainage channel running along the eastern flank of the Nene Washes. The drain contains the highest recorded density of spined loach, and they may also be thriving populations in the smaller ditches of the Washes. The Nene Washes are one of the country's few remaining areas of low-lying, periodically-inundated grassland (washland) habitat and this site is notable for the diversity of plant and associated animal life within its network of dykes.

The SAC is maintained by inundation and is controlled through a Water Level Management Plan (WLMP). The washlands are used for the seasonal uptake of floodwaters. In winter, the Stanground Sluice, which connects Morton's Leam to the River Nene, is kept open at a reduced gauge of 6 inches to provide a freshening flow and maintain water levels for Habitats Site until the growing season begins. Under low winter flows (typically December to March), the Stanground Sluice, which connects Morton's Leam to the River Nene, is closed. Consequently, during winter the River Nene is normally only connected to Morton's Leam and hence the Nene Washes during periods of flood flow, where connection will be either through automatic opening of Stanground Sluice (once the river reaches 3.8mODN), or via the Cradge Bank spillway[36]. In the summer months, flow through Stanground Sluice maintains levels in Morton's Leam and the Nene Washes. This is important for wet fencing, irrigation and nature conservation. The optimal summer flow is 15Ml/d. If the flow at Stanground Sluice is insufficient, RSPB can operate the Gravel Dyke Feed to provide extra River Nene flow into the Washes[37]. During the summer months, the area has traditionally been used for cattle grazing.

5.5.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.5.2.2.1 Spined loach

The spined loach is one of the UK's smallest freshwater fish, usually reaching no more than 14cm 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 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. Spined loaches are found in shallow, slow-flowing or stagnant water in all manner of water bodies.

Spined loaches are nocturnal; they stay hidden under rocks or buried in sand or mud during the day. They are most active at night, when they filter small benthic invertebrates and organic matter from the sediment for food. They possess the ability of intestinal breathing, meaning that when water is oxygen-poor they swallow air at the water's surface bringing oxygen into the intestine, where it is absorbed into the bloodstream. The spawning season is from April to June. Females typically produce 300 to 1,500 eggs close to the ground (e.g. on stones,

[36] Atkins (2015). Drought Plan Environmental Assessment Update. River Nene: Wansford Intake (Rutland Water), Version 7.0

[37] Environment Agency (2011). Lower Nene Operating Procedures.

roots or plants), which are then fertilized by the males. The larvae hatch in four to six days and their expected lifespan is between three and five years[38].

Spined loaches are sensitive to changes in a number of environmental variables, including water quality, temperature, salinity, flow and water levels. Nutrient enrichment is of particular concern, as it promotes benthic algal growth and increased siltation, which could degrade the condition of substrate relied upon by spined loach for spawning and feeding. An increase in nutrients (e.g. phosphate and nitrate) can also result in algal blooms in lentic systems, leading to a decrease in light attenuation and consequently reduced submerged macrophyte cover. An increase in microbial remineralization at the sediment surface due to the influx of organic matter could also result in low dissolved oxygen concentrations. Although spined loach has the stop-gap measure of intestinal breathing when dissolved oxygen levels are low, their preference is for oxygen-rich environments. Persistent anoxia at the sediment-water interface could lead to population decline due to enhanced egg and juvenile mortalities[39].

Fish monitoring surveys have been conducted in 2023[40] and 2024[41] within the River Nene (including five separate sites upstream and downstream of Wansford Intake). Spined loach individuals were recorded in 2023 within the River Nene, downstream of Wansford and more specifically within the Back River directly connected to the Nene Washes SAC (i.e. Moreton's Leam).

5.5.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 6**, Nene Washes SAC is legally underpinned by one SSSI, Nene washes SSSI. Its condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Nene Washes SAC SIP[42] and specifically associated with the qualifying features requiring AA:

- Water pollution: undertake a review of water quality in Mortons Leam and ditches.

5.5.3 Assessment of Effects

An assessment of effects against the relevant Supplementary advice to the conservation objectives (SACO) attributes and targets is provided in **Table 55-5.**

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environment**, Table AN- 29.** Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[38] FishBase (2025), assessed at Cobitis taenia, Spined loach : aquarium

[39] English Nature (1998). The habitat and management requirements of spined loach Cobitis taenia. No 244 – English Nature Research Reports.

[40] Atkins & APEM (2023). drought permit Monitoring. Prepared for Anglian Water Services.

[41] AECOM, (2024). Fish Survey Workbook 2024. drought permit Area: All.

[42] Natural England (2014). Site Improvement Plan: Nene Washes. Site Improvement Plan: Nene Washes - SIP146

Table 55-5: AA against relevant attributes and targets taken from the SACO for Nene Washes SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
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	Operation of the drought permit is anticipated to result in moderate to major impacts upon the hydrology of the River Nene, its geomorphology and its water quality (in particular orthophosphate and dissolved oxygen). **Juvenile densities and population abundance:** Impacts on physical and hydrological integrity of the SAC and supporting habitats may suppress juvenile densities and impact the population abundance. Promotion of algal growth and the consequent increase in organic matter remineralization could create dissolved oxygen concentration sags at the sediment-water interface and potentially lead to increased egg and juvenile spined loach mortalities. This could have long term impacts on population size and on juvenile densities within the SAC. **Distribution and extent of supporting habitats, integrity of off-site habitats, and biological connectivity**: Changes to the River Nene hydrological flow and water quality may impact supporting habitats for spined loach. However, despite these expected major impacts on hydrology, the implementation of the drought action is anticipated to have negligible impacts upon connectivity, channel morphology and habitats over both the summer months and the winter months, as detailed in the hydrological assessment. Therefore, no	**Baseline monitoring (ongoing)** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites, to identify the trigger for initiating a drought permit application. • Initiation/continue campaigns to reduce the distribution input in the surrounding area. • Carry out regular WQ spot sampling. • Water quality monitoring upstream of the SAC to establish possible phosphate issues upstream of the intake. **Drought Level 1 drought measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may
	Population abundance	Maintain the abundance of the spined loach population at a density which is consistently greater than 0.1 individuals/m-2 (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		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Distribution of supporting habitat	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.	AEoI are anticipated upon the extent of supporting habitats and its overall connectivity. **Cover of submerged macrophytes**: Potential increases in orthophosphate concentrations within the Nene Washes could promote algal growth and cause eutrophication. The consequent increase in organic matter remineralisation could lead to reductions in dissolved oxygen and light availability within the water column. Therefore, this could impact on the cover of submerged macrophytes leading to spined loach habitat loss. **Flow regime**: Water levels in the Nene Washes are maintained by inundation and controlled by a WLMP. Reductions in water flow are compliant with attribute thresholds associated with the Nene Washes SAC. Additionally, the implementation of the drought permit is expected to have a minor impact on river flow in both summer and winter for the Nene Washes (see **Appendix A** of the **River Nene (Rutland Water) EAR**) and therefore, no adverse effects as a result of flow reduction are anticipated. **Sediment regime**: Reductions in flow, particularly during the summer when Stanground Sluice is kept open could cause an increase in siltation within the Nene Washes. **Water quantity / quality**: Reductions in water flow are compliant with attribute thresholds associated with the Nene Washes SAC and therefore, no adverse effects as a result of flow reduction are anticipated. As orthophosphate concentrations are already	be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form. • Regular liaison with the Environment Agency and Natural England. **During drought permit implementation monitoring** • Frequently monitor flow against temporary drought permit (minimum residual flow) MRF and cease abstraction at Wansford if flows drop below MRF. • Walkover surveys will monitor features such as habitat availability, providing qualitative information on the effects of the drought measures, allow decisions to be taken quickly regarding further monitoring, and identify exceedance of trigger levels for mitigation. This will start two days after the drought action implementation and take place weekly until the drought permit /
	Extent of supporting habitat	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).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Biological connectivity	Maintain the free movement of spined loach within supporting habitats.	high in the waterbody (Downstream of Wansford intake at Peterborough Town Bridge, the annual mean orthophosphate exceeded the attribute target by 0.05 mg/L from 2010 – 2020 and also), this drought permit could exacerbate current water quality concerns. As stated in **Appendix A** of the **River Nene (Rutland Water) EAR,** the anticipated hydrological impact on the Nene Washes are anticipated to be minor. Therefore, Adverse Effects on the Integrity of the site cannot be ruled out. Mitigation and monitoring should be implemented.	order expires or is revoked, unless otherwise agreed by the EA • Enhanced monitoring of water quality and biological community to quantify the immediate impact of the drought and the response of the biological community in the recovery period, including additional water quality monitoring upstream of Wansford. • Records of daily abstraction quantities and flow should be submitted to the Environment Agency every week, as well as an updated reservoir storage projection for Rutland Water. The Environment Agency should be informed if water levels in Rutland Water return to the normal operating curve. **During drought permit implementation mitigation measures:** • Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems. • Gradual or temporary adjustments to abstraction or compensation
	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.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	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.		flows to prevent stranding, displacement, or stress in sensitive aquatic species. • Variable abstraction at Wansford during one or two 'spate' flow events to flush pollutants and prevent stagnation. • Reduce abstraction during busy navigation periods. Also consider dredging, de-silting or weed clearing at known problem locations on the main navigation channel. • Review AWS planned preventative maintenance to ensure that if a storm occurs after long dry periods the sewage infrastructure does not block and cause overspill to the river. • Cessation rules should be in place to halt abstraction if water quality deteriorates below acceptable levels, or if water levels are affected more than currently predicted. • Continuous flow dissolved oxygen (DO) and other parameter (e.g. temperature, pH, conductivity) monitoring and cessation of abstraction if levels fall below a critical value for fish health or if
	Integrity of off-site habitats	Maintain any supporting habitats present beyond the site boundary upon which the SAC population of spined loach may depend.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Sediment regime	Maintain substrate character at no more than 40% silt.		levels are impacted more than predicted. • Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration. • Regular inspection and clearing of screens to ensure they retain their correct working function. • Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts. **Post drought permit implementation measures:** • Continued river flow monitoring in the River Nene to ensure that drought permit actions are no longer required. • Continued water quality and biological community monitoring to assess the need for continuation of mitigation measures. • Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare. • Modification to barriers and/or flows to improve passage where walkover
	Water quantity / quality	Restore water quality and quantity to the following standards which provides the necessary conditions to support the feature; Dissolved oxygen, ammonia, BOD = Equivalent to Class 'C' of the EA's General Quality Assessment scheme. Soluble reactive phosphorus = 0.1 mg/L-1 annual mean		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
				survey identifies insufficient water depth or volume at obstacles. • Periodic desilting is already required within Moreton's Leam to maintain suitable substrate for spined loach. Therefore, a review of current site management is required to determine the frequency of desilting and if this would prevent AEoI from this drought action. The frequency and duration of the post-drought monitoring will be agreed with the EA and NE

5.6 APPROPRIATE ASSESSMENT: NENE WASHES SPA AND RAMSAR SITE

5.6.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 20**. The following qualifying features have been taken forward to the AA:

- A037 Bewick's swan (Non-breeding)
- A050 Eurasian wigeon (Non-breeding)
- A051 Gadwall (Non-breeding, Breeding)
- A052 Eurasian teal (Non-breeding)
- A054 Northern pintail (Non-breeding)
- A055 Garganey (Breeding)
- A056 Northern shoveler (Non-breeding, Breeding)
- A156a Black-tailed godwit (Breeding)

Nene Washes Ramsar site (see Annex-1: Screening assessment tables**, Table AN- 20**) is designated for the following features taken through to the AA:

- Important assemblage of nationally rare breeding birds. The site also supports a wide range of raptors, several nationally scarce plants, and two vulnerable and two rare British Red Data Book invertebrate species have been recorded. Invertebrate species include *Valvata macrostoma*, *Agabus undulatus, Libellula fulva* and *Anasimyia interpuncta*.
- Bewick's swan with 694 individuals representing an average of 2.3% of the population (5-year peak mean 1998/99 – 2002/03)

Theoretical pathways for effect exist as a result of the River Nene (Pitsford Water) and River Nene (Rutland Water) Drought Permits through:

- potential water flow reduction during operation of the drought permit operation.
- potential deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation following the operation of the drought permit.

5.6.2 Site Summary

5.6.2.1 Site Description

Nene Washes SPA and Ramsar site (centred on OS grid reference TL 307 999) cover approximately 1,520ha and share the same boundaries. The Nene Washes are an extensive mosaic of low-lying wet grassland and rough pasture located along the lower reaches of the River Nene. 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. 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.

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. 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*.

The key threats to birds within this assemblage are inappropriate water levels, water quality degradation and changes to sediment transport and deposition processes. Flooding during spring and early summer can severely damage the breeding bird interest by flooding nests, drowning young and degrading habitat. Deep

flooding during winter impacts on the overwinter bird population, again due to habitat loss. Disruption of the normal sediment transport and deposition processes resulting from flow velocity changes could also result in habitat loss. Nutrient enrichment can lead to invertebrate, fish and macrophyte species decline, which could compromise food availability for waterfowl.

5.6.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.6.2.2.1 Bewick's swan

The abundance of Bewick's swan in the UK is monitored through the Wetland Bird survey (WeBS) and the International Census of the Northwest European population carried out every five years by Wildfowl & Wetland Trust. The 9th census undertaken in January 2020 recorded a total of 1,290 individuals in Britain and Ireland [43], which represents a decline of 70.6% compared with the total recorded in 2015 and is the lowest census total to date (i.e. a total of 4,371 individuals in Britain and Ireland were recorded in 2015, representing a decline of 38% compared with the 2010 data[44], and was the lowest since the peak in 1990). In Britain, the majority of the birds were recorded in Norfolk and Cambridgeshire.

The SPA supported 1,300 individuals at notification, more than 7% of the north-west European wintering population and the Ramsar site supported 694 individuals at notification (average of 2.3% of the population, 5-year peak mean 1998/99 – 2002/03). 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[45,46] and the majority of British SPAs show short-, medium- and long-term Wetland Bird Survey (WeBS) alerts for Bewick's swan. The declines are 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 in the African Eurasian Waterbird Agreement (AEWA) Single Species Action Plan[47], including 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.

Bewick's are the smallest swans to visit Europe from their breeding grounds in Russia. Supporting habitats include intertidal mudflats and sandflats, and saltmarshes.

5.6.2.2.2 Breeding bird species: gadwall, garganey, shoveler and black-tailed godwits (description taken from SACO)

Gadwall

The SPA supported 25 breeding pairs at the time of SPA notification (in 2015), 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.

Garganey

The SPA 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 5 pairs.

Shoveler

The SPA 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.

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[43] Wildfowl Wetland Trust (WWT), (2021), *Waterbirds counters join forces to help with the International Swan Census*, from the WeBS News Issue 37 (Autumn 2021). https://issuu.com/british_trust_for_ornithology/docs/websnews37forweb/12.

[44] WWT, (2021). *Goose & Swan Monitoring Programme: survey results 2019/20 Bewick's Swan Cygnus columbianus bewickii* . WWT/JNCC/NatureScot, Slimbridge.

[45] Holt C.A, et al., (2015) Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report.

[46] Rees E.C and Beekman J.H (2010) Northwest European Bewick's swan: a population in decline. British Birds 103: 640-650

[47] Nagy S. et al, (2012). International Single Species Action Plan for the Conservation of the Northwest European Population of Bewick's Swan (*Cygnus columbianus bewickii*). AEWA Technical Series No. 44. Bonn, Germany.

Black-tailed godwits

The SPA 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.

The Ramsar site supported 482 individuals, representing an average 1.3% of the population (5-year peak mean 1998/99 – 2002/03, spring peak) at notification in 2008.

5.6.2.2.3 Wintering bird species: wigeon, teal, gadwall, pintail and shoveler

Wigeon

The SPA supported 3,640 individuals at notification, 1% of the British population. The peak 5-year mean from 2013/14 - 2017/18 was 13,864. 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. 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.

Teal

The SPA 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. They are present in a wide range of wetland habitats including flooded grassland, bays of large waterbodies and estuaries. It is extremely sensitive to disturbance, and particularly vulnerable to severe cold weather.

Gadwall

The SPA 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.

Gadwall requires generally undisturbed, still, eutrophic waters that have a combination of open water and emergent vegetation. Gadwall eats mostly submerged aquatic vegetation such as algae, grasses, rushes, sedges, pondweed, widgeon grass, and water milfoil, including leaves, stems, roots, and seeds. They also eat snails, midges, water beetles, and other invertebrates.

Pintail

The SPA 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.

Pintails are a highly mobile species which occurs in small numbers across the floodplain. It is mainly found dabbling in open water, but it also grazes on pastures and marsh and forages for spilt grain on cereal fields.

Shoveler

The SPA 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. Wildfowling at the Nene Washes is mainly carried out in the Low Wash and the High Wash. During the wildfowling season (September until the end of January) these areas tend to be used less by waders and waterfowl. Stanground and Ring's End are used less by the qualifying bird species than the rest of the site because they are better drained/higher, so conditions aren't as suitable in most years; if there is a heavy flood, however, they become important. Shoveler is a dabbling duck which prefers larger bodies of permanent water, although it will also feed on flooded grassland.

5.6.2.2.4 Breeding bird assemblage

The SPA and Ramsar site support a diverse assemblage of breeding birds of wet grasslands, including redshank, snipe, lapwing, mute swan, sedge warbler and yellow wagtail.

The most important area for breeding wetland birds 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.

5.6.2.2.5 Nationally scarce plants and invertebrate species

The Ramsar site supports a range of rich flora and nationally scarce plants including fringed water-lily, hair-like pondweed and marsh dock and two rare British Red Data Book invertebrate species. The drought permit has potential to result in elevated levels of eutrophication, algal blooms and increased level of pollutants, such as orthophosphates within the Nene Washes Ramsar site. If sustained over a prolonged period, this could lead to changes in community structure of aquatic macrophytes, while algal blooms could result in choking of segments. In addition, there is potential for increases in fine sediment deposition to adversely affect submerged macrophyte abundance and composition. Such changes in water quality would likely lead to a deterioration of supporting habitats and mortality to macroinvertebrate communities.

5.6.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 20**, Nene Washes SPA is legally underpinned by one SSSI, Nene washes SSSI. Its condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Nene Washes SPA SIP[48] and specifically associated with the qualifying features requiring AA:

- Hydrological changes: monitoring of birds and water levels and flexible response to yearly variations through liaison between key partners.

There is no SIP for the Nene Washes Ramsar site.

5.6.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets developed for the Nene Washes SPA, is provided in **Table 5-6**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment, **Table AN- 29**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[48] Natural England (2014). Site Improvement Plan: Nene Washes. Site Improvement Plan: Nene Washes - SIP146

Table 5-6: AA against relevant attributes and targets taken from the SACO for Nene Washes SPA and Ramsar site

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Bewick's swan	Population abundance	Restore the size of the non-breeding Bewick's swan population to a level which is above 1,300 individuals whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	Operation of the drought permit is anticipated to result in moderate to major impacts upon the hydrology of the River Nene, its geomorphology and its water quality (in particular orthophosphate and dissolved oxygen). **Water quality / quantity:** Potential increases in orthophosphate concentrations within the Nene Washes could promote algal growth and cause eutrophication. As orthophosphate concentrations are already high in the waterbody (Downstream of Wansford intake at Peterborough Town Bridge, the annual mean orthophosphate exceeded the attribute target by 0.05 mg/L from 2010 – 2020 and also), this drought permit could also exacerbate current water quality concerns. The consequent increase in organic matter remineralisation could lead to reductions in dissolved oxygen and light availability within the water column. As stated in the **EAR River Nene (Rutland Water) Appendix A**, the anticipated hydrological impact on the Nene	**Baseline measures (ongoing):** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites, to identify the trigger for initiating a drought permit application. • Initiation/continue campaigns to reduce the distribution input in the surrounding area. • Carry out regular WQ spot sampling. • Water quality monitoring upstream of the SPA and Ramsar site to establish possible phosphate issues upstream of the intake. • Data on bird counts within the Nene Washes Estuary is available from the Water Bird Survey (WeBS)[49]. This data will be examined regularly to determine if there is any negative change to the population densities for designated populations within the SPA and Ramsar site. **Drought Level 1 drought measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during
	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		
	Hydrology/flow	Maintain hydrological processes to ensure continuity of water availability in feeding sites, with visible areas of standing shallow water during non-breeding period.		
	Water area	Maintain the number of large waterbodies of optimal size (typically >10 ha).		
	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. Soluble reactive phosphorus < 0.1 mg/L-1 annual mean		
	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)		
Non-breeding waterfowl assemblage • wigeon • gadwall • teal • pintail	Population abundance	Maintain the size of the non-breeding population at a level noted at notification: • wigeon: above 3,540 individuals • gadwall: above 95 individuals • teal: above 980 individual • pintail: above 440 individuals • shoveler: above 110 individuals		

[49] WeBS BTO WeBS Reports

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
• shoveler	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)	Washes are anticipated to be 'minor'. Therefore, this could impact the cover of submerged macrophytes leading to reductions in food availability for bird populations within the Nene Washes SPA and Ramsar site resulting in AEoI of the site. Mitigation and monitoring should be implemented. **Food availability within supporting habitat:** Eutrophication could compromise food availability for bird populations of the Nene Washes SPA and Ramsar site by causing deterioration in the cover of submerged macrophytes and associated invertebrates. Mitigation and monitoring should be implemented. **Population abundance:** Hydrological changes in the Nene washes is a key threat to qualifying bird species. Reductions in food availability in the Nene Washes due to deteriorations in water quality from reduced water flows could cause a decline in the carrying capacity of site, reducing the population abundance. Water levels in the Nene Washes are maintained by inundation, which is controlled by a WLMP and flows from the River Nene enter the	low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form • Biological monitoring of macroinvertebrates, macrophytes, water quality and siltation to ensure accurate baseline of conditions. • Contact all licensed abstractors within the potentially affected reach. Regular liaison with the Environment Agency. **During drought permit implementation measures:** • Frequently monitor flow against temporary drought permit MRF and cease abstraction at Wansford if flows drop below MRF. • Enhanced monitoring of water quality and biological community to quantify the immediate impact of the drought and the response of the biological community in the recovery period, including additional water quality monitoring upstream of Wansford. • Records of daily abstraction quantities and flow should be submitted to the Environment Agency every week, as well as an updated reservoir storage projection for Rutland Water. The Environment
Non-breeding waterfowl assemblage • gadwall • teal • pintail • shoveler	Water depth	Maintain the availability of standing water of optimal depth, typically: • gadwall: <0.25m deep, over at least 50% of the total standing water area. • pintail: 0.1-0.3m deep. • teal: <0.1m deep. • shoveler: <0.3m deep.		
Breeding waterfowl assemblage • gadwall • garganey • shoveler • black-tailed godwit	Population abundance	Maintain the size of the breeding population at a level noted at notification: • gadwall: above 25 pairs • garganey: above 5 pairs • shoveler: above 36 pairs • black-tailed godwit: above 16 pairs		
	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)		
	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. Soluble reactive phosphorus < 0.1 mg/L-1 annual mean		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Breeding waterfowl assemblage • gadwall • garganey • shoveler	Water depth	Maintain the availability of standing water of optimal depth, typically: • gadwall: <0.25m deep. • garganey: <0.2m deep. • shoveler: <0.3m deep	Nene Washes and Moreton's Leam via Stanground Sluice. Additionally, the implementation of the drought permit is expected to have a minor impact on river flow in both summer and winter for the Nene Washes (see **Appendix A** of the **River Nene (Rutland Water) EAR**) and therefore, no adverse effects as a result of flow reduction are anticipated. **Hydrology / flow:** Water levels in the Nene Washes are maintained by inundation and controlled by a WLMP. Reductions in water flow are compliant with attribute thresholds associated with the Nene Washes SAC. Additionally, the implementation of the drought permit is expected to have a minor impact on river flow in both summer and winter for the Nene Washes (see **Appendix A** of the **River Nene (Rutland Water) EAR**) and therefore, no adverse effects as a result of flow reduction are anticipated. **Water depth:** Water levels in the Nene Washes are maintained by inundation, which is controlled by a WLMP and flows from the River Nene enter the Nene Washes and Moreton's Leam via Stanground Sluice. Although flow and water levels in the River Nene downstream of Wansford intake are expected to	Agency should be informed if water levels in Rutland Water return to the normal operating curve. • The AWS Wastewater Improvement Planning (permanent improvement scheme) will provide details of actions including aeration of the discharge which will be beneficial to water quality. **During drought permit implementation mitigation measures:** • Variable abstraction at Wansford during one or two 'spate' flow events to flush pollutants and prevent stagnation. • Reduce abstraction during busy navigation periods. Also consider dredging, de-silting or weed clearing at known problem locations on the main navigation channel. • Review AWS planned preventative maintenance to ensure that if a storm occurs after long dry periods the sewage infrastructure does not block and cause overspill to the river. • Cessation rules should be in place to halt abstraction if water quality deteriorates below acceptable levels, or if water levels are affected more than currently predicted. • Continuous flow DO and other parameter (e.g. temperature, pH, conductivity) monitoring and cessation of abstraction if levels fall
Eurasian wigeon (non-breeding)	Food availability within supporting habitat	Maintain the cover/abundance of preferred food plants (particularly grasses and aquatic macrophytes).		
Gadwall (breeding)	Food availability within supporting habitat	Maintain a high cover/abundance of food plants preferred by breeding 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.		
Eurasian teal (non-breeding)	Food availability within supporting habitat	Maintain the cover/abundance of preferred food plants (e.g. *Polygonum, Eleocharis, Rumex, Ranunculus*) and the availability of key prey species (e.g. *Hydrobia*, flies, caddisfly, beetles, bugs, hatching midges) at preferred prey sizes.		
Northern pintail (non-breeding)	Food availability within supporting habitat	Maintain availability of key prey species (hatching midges, insects, molluscs and crustaceans, *Hydrobia*) of preferred prey sizes and cover/abundance of preferred food plants (e.g. *Potamogeton, Elodea, Rumex, Glyceria, Chara*).		
Garganey (breeding)	Food availability within supporting habitat	Maintain a high cover/abundance of preferred food plants (e.g. *Potamogeton*, *Sparganium, Scirpus*, *Carex*, *Glyceria*, *Rumex*, *Ranunculus* spp., *Ceratophyllum*, *Najas*).		
	Hydrology / flow	Maintain water availability in feeding sites to provide areas of shallow water. Maintain the hydrology of a waterbody used as a feeding site such that water levels reduce (or are reduced) each		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		month from the time of mean hatch date to the end of the breeding season.	decrease under drought permit conditions, structural controls on the Nene Washes mean that this impact will not be replicated within the designated site. As stated in **Appendix A** of the **River Nene (Rutland Water) EAR**, the anticipated hydrological impact on the Nene Washes are anticipated to be minor. Therefore, no adverse effects as a result of reduction in water depth are anticipated.	below a critical value for fish health or if levels are impacted more than predicted. • Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems. **Post drought permit implementation measures (commence after drought permit has been lifted):** • Continued flow monitoring in the River Nene to ensure that drought permit actions are no longer required. • Continued water quality and biological community monitoring to assess the need for continuation of mitigation measures.
Northern shoveler (breeding)	Food availability within supporting habitat	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.		
	Hydrology / flow	Maintain the hydrology of a waterbody used as a feeding site such that water levels reduce (or are reduced) from the time of mean hatch date to the end of the breeding season. Maintain water availability in feeding sites to provide shallow surface water and damp field conditions.		
Northern shoveler (non-breeding)	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (small insects, crustaceans, molluscs at preferred prey sizes. Maintain the high cover/abundance of preferred food plants (seeds of aquatic and marginal vegetation).		
Black-tailed godwit (breeding)	Food availability within supporting habitat	Maintain an abundance of available prey (soil invertebrates, particularly 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.		

5.7 APPROPRIATE ASSESSMENT: NORFOLK VALLEY FENS SAC

5.7.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 7.** The following qualifying features have been taken forward to the AA:

- H7230 Alkaline fens
- H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- H7210 Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae*
- H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae*, *Salicion albae*)

Theoretical pathways for effect exist as a result of the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit through:

- potential groundwater levels drop-dawn during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.7.2 Site Summary

5.7.2.1 Site Description

Norfolk Valley Fens (centred on OS grid reference TL937960) covers 616.48ha and comprises a series of 14 valley-head spring-fed fens scattered across 200km^2 of central and north Norfolk. Such spring-fed flush fens are very rare in the lowlands. The spring-heads are dominated by the small sedge fen type, mainly referable to black-bog-rush – blunt-flowered rush (*Schoenus nigricans – Juncus subnodulosus*) mire, but there are transitions to reedswamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation.

In places the calcareous fens grade into acidic flush communities on the valley sides. Purple moor-grass *Molinia caerulea* is often dominant with a variety of mosses including thick carpets of bog-moss *Sphagnum* spp. Marshy grassland may be present on drier ground and purple moor-grass is again usually dominant but cross-leaved heath *Erica tetralix* can be frequent. Alder *Alnus glutinosa* forms carr woodland in places by streams. Wet and dry heaths and acid, neutral and calcareous grassland surround the mires.

5.7.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.7.2.2.1 Alkaline fens

Alkaline fens consist of a complex assemblage of vegetation types, characteristic of sites where there is tufa and/or peat formation with a high water table and a calcareous base-rich water supply. The core vegetation is short sedge mire (mire with low-growing sedge vegetation) of the following NVC types:

- M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire
- M10 *Carex dioica – Pinguicula vulgaris* mire
- M13 *Schoenus nigricans – Juncus subnodulosus* mire

Norfolk Valley Fens is one of two sites selected in East Anglia where the main concentration of lowland alkaline fens occurs. The SAC comprises a series of valley-head spring-fed fens where most of the vegetation is of the small sedge fen type, mainly referable to the M13 NVC community, but there are transitions to reedswamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora associated with these fens, including species such as grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris*, marsh helleborine *Epipactis palustris* and narrow-leaved marsh-orchid *Dactylorhiza traunsteineri*. Norfolk flapwort *Leiocolea rutheana*, a rare component species of the alkaline fen community, is in decline.

According to the SACO[50], alkaline fens has been reported across all 14 of the SSSIs that underpin the SAC, including Foulden Common SSSI located within the ZoI, with the presence of M13.

5.7.2.2.2 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)*

Molinia meadows are found mainly on moist, moderately base-rich, peats and peaty gley soils, often with fluctuating water tables. They usually occur as components of wet pastures or fens, and often form mosaics with dry grassland, heath, mire and scrub communities. This habitat type includes the most species-rich *Molinia* grasslands in the UK, in which purple moor-grass *Molinia caerulea* is accompanied by a wide range of associated species, including rushes, sedges and tall-growing herbs. The more impoverished forms of *Molinia* pasture on acidic substrates are excluded from the Annex I definition. In the UK, these grasslands are represented by two NVC types: M24 *Molinia caerulea – Cirsium dissectum* fen-meadow and M26 *Molinia caerulea – Crepis paludosa* mire.

According to the SACO, the feature has been recorded within ten SSSIs legally underpinning the SAC (i.e. Badley Moor SSSI, Booton Common SSSI, Buxton Heath SSSI, Flordon Common SSSI, Great Cressingham Fen SSSI, Holt Lowes SSSI, Sheringham and Beeston Regis Commons SSSI, Southrepps Common SSSI and Swangey Fen SSSI), however none of these sites are located within the ZoI. A review of the SSSIs located within the ZoI identified the presence of M24 - *Molinia caerulea - Cirsium dissectum* fen meadow within Foulden Common SSSI located within the ZoI.

5.7.2.2.3 Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae*

Calcareous fens comprise the more species-rich examples of great fen-sedge *Cladium mariscus* fen, particularly those stands enriched with elements of the *Caricion davallianae* (i.e. small-sedge fen with open low-growing sedge vegetation). Davall's sedge *Carex davallianae* itself is extinct in the UK. The NVC types which are associated with (but not necessarily confined to) this Annex I type, where they support abundant *C. mariscus*, are:

S2 *Cladium mariscus* swamp and sedge beds

S24 *Phragmites australis – Peucedanum palustris* tall-herb fen

S25 *Phragmites australis – Eupatorium cannabinum* tall-herb fen

M9 *Carex rostrata – Calliergon cuspidatum/ giganteum* mire

M13 *Schoenus nigricans – Juncus subnodulosus* mire

M14 *Schoenus nigricans – Narthecium ossifragum* mire

M24 *Molinia caerulea – Cirsium dissectum* fen-meadow

SD14 *Salix repens – Campylium stellatum* dune slack community

SD15 *Salix repens – Calliergon cuspidatum* dune slack community

This habitat is supported by appropriate hydrological regime and changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. According to the SACO, this feature has been recorded within five SSSIs underpinning the SAC, including Foulden Common SSSI located within the ZoI.

5.7.2.2.4 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

This habitat feature comprises woodland area with veteran trees and dead wood categorised by the following NVC: W2a *Alnus glutinosa – Filipendula ulmaria; W5 Alnus glutinosa – Carex paniculate* woodland; W6 *Alnus glutinosa – Urtica dioica* woodland and W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum*.

This habitat is supported by surface and/or groundwater and therefore water quality and quantity are critical to maintain the habitat. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present.

According to the SACO, this feature has been recorded within five SSSIs underpinning the SAC, including Foulden Common SSSI located within the ZoI.

[50] Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features, Norfolk Valley Fens SAC. https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012892.pdf

5.7.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 7**, Norfolk Valley Fens SAC is legally underpinned by several SSSI[51]. Their condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data**.**

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Norfolk Valley Fens SAC SIP[52] and specifically associated with the qualifying features requiring AA:

- Inappropriate water levels: investigate the hydrological functioning of Thompson Water, Carr & Common and Foulden Common, including vegetation surveys.
- Hydrological changes: establish and implement a pro-active approach to water level management based on the findings of the investigation.
- Water abstraction: translocate the boreholes that have been shown to adversely affect Sheringham and Beeston Regis Commons, and Coston Fen. Vary the licences that have been shown to adversely affect Buxton Heath, and East Walton and Adcock's Common.
- Changes in species distributions: understand and halt the decline of characteristic SAC species.

5.7.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets is provided in **Table 55-7**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environment**, Table AN- 28**: Summary of Potential Changes to the Physical Environment of the Groundwater Abstractors from Implementation of the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and **Table AN- 31**: Summary of potential changes in the physical environment as a result of the Costessey (Heigham WTW) Drought Permit and **Table AN- 27**: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of the Wellington Wellfield (Stoke Ferry & Marham WTW) . Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[51] Badley Moor SSSI, Booton Common SSSI, Buxton Heath SSSI, Coston Fen, Runhall SSSI, East Walton and Adcock's Common SSSI, Flordon Common SSSI, Foulden Common SSSI, Great Cressingham Fen SSSI, Holt Lowes SSSI, Potter & Scarning Fens, East Dereham SSSI, Sheringham and Beeston Regis Commons SSSI, Southrepps Common SSSI, Swangey Fen, Attleborough SSSI and Thompson Water, Carr and Common SSSI

[52] Natural England (2014). Site Improvement Plan: Norfolk Valley Fens. SIP141006FINALv1.0 Norfolk Valley Fens.pdf

Table 55-7: AA against relevant attributes and targets taken from the SACO for Norfolk Valley Fens SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Alkaline fens	Spatial distribution of the feature within the site	Maintain and restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site.	Alkaline fens, Molinia meadow, calcareous fens and alluvial forests have been identified, in the ZoI within Foulden Common SSSI legally underpinning the SAC. Based on groundwater assessment, impacts have been screened out of further groundwater impact assessment since groundwater level change is less than 0.05m and minor impacts are anticipated upon Foulden Common SSSI. Furthermore, changes to the baseline river flows of the River Wissey which flows approximately 800m from the SAC are considered negligible. Given the minor magnitude of the effect, no AEoI are anticipated upon alkaline fens, Molinia meadow, calcareous fens and alluvial forests located within Foulden Common SSSI.	No mitigation nor monitoring measures are deemed necessary with regards to Norfolk Valley Fens SAC. The drought permits alone is not anticipated to result in AEoI upon the SAC.
	Extent of the feature within the site	Restore the total extent of the feature to baseline-value of 61.65ha.		
	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following NVC types: • M9 *Carex rostrata - Calliergon cuspidatum/giganteum* mire • M13 *Schoenus nigricans - Juncus subnodulosus* mire.		
Molinia meadows	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site.		
	Extent of the feature within the site	Restore the total extent of the feature to 12.95ha.		
	Hydrology: water table	Maintain a hydrological regime that provides a sub-surface water table during the summer (range -2 to -48 cm below ground level) and a winter water table ± at the surface. Inundation should be absent or only occasional to a minor degree in winter		
	Maintaining integrity of hydrological catchment	Maintain the full range of hydrological/ hydrogeological aspects of a site's catchment that contribute to its functioning and the maintenance of the feature		
	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following NVC type: M24		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		Molinia caerulea - Cirsium dissectum fen meadow.		
	Water quality	Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.		
Calcareous fens	Extent of the feature within the site	Restore the total extent of the feature to 14.18ha.		
	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site.		
	Hydrology	Restore a high piezometric head and permanently high-water table (allowing for natural seasonal fluctuations) on groundwater dependent sites.		
	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following NVC types: • S2 *Cladium mariscus* swamp and sedge-beds • S25 *Phragmites australis - Eupatorium cannabinum* tall-herb fen typical sub-community • S25c *Phragmites australis - Eupatorium cannabinum* tall-herb fen, *Cladium mariscus* sub-community		
Alluvial forests	Extent of the feature within the site	Maintain the total extent of the feature to 6.78ha. The SAC is considered to support a significant presence of this feature.		
	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site.		
	Vegetation communities composition	communities of the feature are referable to and characterised by the following NVC types:		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		• W5 *Alnus glutinosa - Carex paniculata* woodland. • W6 *Alnus glutinosa - Urtica dioica* woodland. • W7 *Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum* woodland.		
	Water quality /quantity	Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature.		
Calcareous fens, alluvial forest and alkaline fens	Hydrology	At a site, unit and/or catchment level (as necessary, maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site		

5.8 APPROPRIATE ASSESSMENT: OUSE WASHES SAC

5.8.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 9**. The following qualifying features have been taken forward to the AA:

- S1149 Spined loach

Theoretical pathways for effect exist as a result of the River Gt Ouse (Grafham Water) Drought Permit through:

- potential water flow reduction during operation of the drought permit operation.
- potential deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation following the operation of the drought permit.

5.8.2 Site Summary

5.8.2.1 Site Description

Ouse Washes SAC (centred on OS grid reference TL498895) cover approximately 332.61ha The Ouse Washes is one of the country's few remaining areas of extensive washland habitat. The associated dykes and rivers hold a great variety of aquatic plants; the pondweeds *Potamogeton spp*. are particularly well represented. The associated aquatic fauna is similarly diverse and includes spined loach *Cobitis taenia*. The Counter Drain, with its clear water and abundant aquatic plants, is particularly important, and a healthy population of spined loach is known to occur.

5.8.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.8.2.2.1 Spined loach

The Ouse Washes represent spined loach populations within the River Ouse catchment. The Counter Drain (or Old Bedford River), with its clear water and abundant macrophytes, is particularly important, and a healthy population of spined loach is known to occur. The Counter Drains runs parallel to the River Great Ouse.

The spined loach is one of the UK's smallest freshwater fish, usually reaching no more than 14cm 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 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. Spined loaches are found in shallow, slow-flowing or stagnant water in all manner of water bodies.

Spined loaches are nocturnal; they stay hidden under rocks or buried in sand or mud during the day. They are most active at night, when they filter small benthic invertebrates and organic matter from the sediment for food. They possess the ability of intestinal breathing, meaning that when water is oxygen-poor they swallow air at the water's surface bringing oxygen into the intestine, where it is absorbed into the bloodstream. The spawning season is from April to June. Females typically produce 300 to 1,500 eggs close to the ground (e.g. on stones, roots or plants), which are then fertilized by the males. The larvae hatch in four to six days and their expected lifespan is between three and five years[53].

Spined loaches are sensitive to changes in a number of environmental variables, including water quality, temperature, salinity, flow and water levels. Nutrient enrichment is of particular concern, as it promotes benthic algal growth and increased siltation, which could degrade the condition of substrate relied upon by spined loach for spawning and feeding. An increase in nutrients (e.g. phosphate and nitrate) can also result in algal blooms in lentic systems, leading to a decrease in light attenuation and consequently reduced submerged macrophyte cover. An increase in microbial remineralization at the sediment surface due to the influx of organic matter could also result in low dissolved oxygen concentrations. Although spined loach has the stop-gap measure of intestinal breathing when dissolved oxygen levels are low, their preference is for oxygen-rich

[53] FishBase (2025), assessed at Cobitis taenia, Spined loach : aquarium

environments. Persistent anoxia at the sediment-water interface could lead to population decline due to enhanced egg and juvenile mortalities[54].

Fish monitoring surveys have been conducted in 2023[55] and 2024[56] within the River Ouse (including four separate sites upstream and downstream of Offord Intake) upstream of the SAC. One single spined loach individual was recorded in 2023 within the River Ouse at Offord Triangle (TL 21587 67399), approximately 4.5km upstream of the SAC. No further records were identified in 2024.

5.8.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 9**, Ouse washes SAC is legally underpinned by one SSSI, Ouse Washes SSSI. Its condition is detailed in Annex-2: SSSI Detailed Condition DataAnnex-2: SSSI Detailed Condition Data:

> Ouse Washes SSSI: 15.73% favourable, 84.27% unfavourable – no change (condition last assessed in 2024).

Unit 22 of the SSSI encompasses the River Great Ouse located within Reach 2.

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Ouse Washes SAC SIP[57] and specifically associated with the qualifying features requiring AA:

> Inappropriate water levels: Habitat creation to offset historical decline of wintering and breeding birds and other strategies to alleviate flooding
>
> Water Pollution: Implementation of Diffuse Water Pollution plan to tackle inappropriate levels of nutrients from flooding

5.8.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets developed for the Ouse Washes SAC, is provided in **Table 55-8.**

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 30.** Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[54] English Nature (1998). The habitat and management requirements of spined loach Cobitis taenia. No 244 – English Nature Research Reports.
[55] Atkins & APEM (2023). drought permit Monitoring. Prepared for Anglian water.
[56] AECOM, (2024). Fish Survey Workbook 2024. drought permit Area: All.
[57] Natural England (2014). Site Improvement Plan: Ouse Washes. Site Improvement Plan: Ouse Washes - SIP160

Table 55-8: AA against relevant attributes and targets taken from the SACO for Ouse Washes SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
Spined loach	Juvenile densities	Maintain juvenile densities of spined loach at or above those expected under un-impacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations	Impacts to the population may occur indirectly through habitat loss or degradation, as a result of potential impacts such as alterations to water levels and flow which can cause drought conditions or water quality deterioration. Reduced water flow could cause nutrient concentrations in the SAC to increase, particularly if major hydrological impacts occur during Stage 2 in the summer. Water quality deterioration and increased siltation will also impact macrophyte communities used as feeding and sheltering sites for juvenile spined loach. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. This could have long term impacts on population size and on juvenile densities within the SAC which in turn may result in AEoI upon the juvenile densities of spined loach within the SAC. Mitigation and monitoring measures should be implemented.	The following monitoring and mitigation measures should be implemented to avoid any AEoI upon the SAC. **Baseline monitoring (ongoing):** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites (see River Gt Ouse (Grafham Water) EAR Appendix C for locations). • EA and Anglian Water to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites (see River Gt Ouse (Grafham Water) EAR Appendix C for locations). • Fish monitoring at a number of locations, including reaches potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare (see River Gt Ouse (Grafham Water) EAR Appendix C for locations). • Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years
	Population size	Maintain the abundance of the spined loach population at or above a minimum density of 0.52 individuals/m² and 0.15 individuals/ m² in the Outer and Inner rivers respectively, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	Data is currently limited on the current abundance of spined loach in the SAC. Reduced water flow and water quality deterioration could have long term impacts on population size within the SAC and in turn AEoI on the SAC. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. Mitigation and monitoring measures should be implemented.	
	Distribution of supporting habitat	Maintain the distribution and continuity of the feature and its supporting habitat, including where applicable its	Potential increases in orthophosphate concentrations within the River Gt Ouse could promote algal growth and cause eutrophication. The consequent increase in organic matter remineralisation could lead to reductions	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
		component vegetation types and associated transitional vegetation types, across the site	in dissolved oxygen and light availability within the water column. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. Therefore, this could impact the cover of submerged macrophytes leading to spined loach habitat loss within the SAC resulting in AEoI. Mitigation and monitoring should be implemented.	(see River Gt Ouse (Grafham Water) EAR Appendix C for locations). • Initial consultation with stakeholders, including the Environment Agency and Natural England. **Drought Level 1 drought permit measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats during the drought level 1 period. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form. • Walkover surveys during the drought level 1 will monitor the current hydrological, water quality and habitat conditions. These surveys incorporate elements of the River Habitat Survey (RHS) and include identification of ecological features such as key fish habitats and notes any potential risks within the reach. • Spot water quality monitoring and flow monitoring via ADCP at key locations to provide up to date data on conditions. Additionally, continuous monitoring of fish passes to monitor water levels, in order to determine the current conditions of fish passage throughout the reach. Regular liaison with the Environment Agency and Natural England.
	Extent of supporting habitat	Maintain the overall extent of habitat(s) which supports the spined loach feature at approximately 311 hectares of standing open water and canals (ditch system)	Potential increases in orthophosphate concentrations within the River Gt Ouse could promote algal growth and cause eutrophication. The consequent increase in organic matter remineralisation could lead to reductions in dissolved oxygen and light availability within the water column. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. Therefore, this could have an impact on the cover of submerged macrophytes leading to spined loach habitat loss within the SAC resulting in AEoI. Mitigation and monitoring should be implemented.	
	Biotope mosaic	Maintain the characteristic physical form of the river channels which provide supporting habitat for spined loach	Implementation of the drought permit is anticipated to have minor to negligible impacts upon flow hydraulics and sediment dynamics. It may impact on the health, diversity and distribution of macrophyte communities that support spined loach populations therefore, resulting in AEoI on the SAC. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. Mitigation measures should be implemented.	
	Cover of submerged and marginal vegetation	Retain sufficient submerged and marginal vegetation to maintain cover and spawning substrate unaffected by river channel management practices.	Potential increases in orthophosphate concentrations within the River Great Ouse could promote algal growth and cause eutrophication. The consequent increase in organic matter remineralisation could lead to reductions in dissolved oxygen and light availability within the water column. Details of the anticipated changes resulting	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
			grom the drought permit are shown in Annex-3: Potential changes to physical environment. Therefore, this could have an impact on the cover of submerged macrophytes leading to spined loach habitat loss within the SAC resulting in AEoI. Mitigation and monitoring measures should be implemented.	**During drought permit implementation:** • Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems. • Walkovers to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows. • In-stream water quality monitoring in the form of spot sample measures using handheld meters. • Monitoring of key existing river flow site via ADCP spot measurements. • Regular liaison with the Environment Agency and Natural England. • Gradual or temporary adjustments to abstraction or compensation flows to prevent stranding, displacement, or stress in sensitive aquatic species. • Aeration of watercourse where significant mortality. • Provision of in-stream structures and flow baffles to create functional refuges to support flow sensitive species where walkover surveys identify a projected loss of habitat inundation.
	Flow regime	Maintain a flow regime which is characteristic of the river channels.	The ZoI for this drought permit includes the Ouse Washes, which overlaps Reach 2. Spined loach are primarily found within Old Bedford River/Counter Drain, however hydrological impact assessments have not been undertaken for the Counter Drain. Stage 1: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 19.3%-19.6% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 30.2% reduction during summer Q99 flows is anticipated, and 8.7% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR **Appendix A**). Stage 2: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 15.3%-16.9% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 26% reduction during summer Q99 flows is anticipated, and 6.9% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR **Appendix A**). This impact assessment was undertaken is based on available information at the time. This will be updated when further information on water transfers made on the Ouse Washes is received. This is because the Old Bedford River only takes flows from the River Great Ouse during high flow periods when the Earith Sluice gate is opened to provide additional flood storage[58] . As the drought permit proposed will be operational during low flows a hydrological impact assessment was not	

[58] Environment Agency (2017). Great Ouse Tidal River Baseline Report.

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
			deemed necessary, and implementation of the drought permit is not considered to have an impact on water flow within Old Bedford River/Counter Drain. Therefore, no AEoI are anticipated upon the spined loach as a result of changed to the flow regime.	• Regular inspection and clearing of screens to ensure they retain their correct working function. • Rescue of fish, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts. • Cessation rules for the drought permit are proposed in River Gt Ouse (Grafham Water) EAR Appendix C in response to monitoring targets during operation of the drought permit. **Post drought permit implementation measures:** • Continued monitoring of key existing water quality sites via spot sampling. • Continued monitoring of key existing river flow site via ADCP spot measurements. • Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare. • Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years.
	Sediment regime	Maintain in-channel substrate character of at least 20% sand and no more than 40% silt	Implementation of the drought permit is predicted to result in minor to moderate impacts upon the river geomorphology, in particular within Reach 2. Furthermore, the drought permit could result in benthic algae growth within the channels. This could lead to increased levels of siltation which in the short-term could produce sub-optimal feeding conditions for spined loach, and in the long-term cause declines in the abundance and composition of macrophytes. For optimal conditions substrates should be at least 20% sand and no more than 40% silt. Whilst the species can tolerate silt and mud, it has a preference for sandy substrate. High sediment cohesiveness is likely to adversely affect the feeding process[59]. Mitigation measures should be implemented.	
	Water quality - nutrients	Maintain the nutrient regime of the river channels at or below the following levels; an annual mean of 0.1mgl-1 total phosphorous.	Reduction in flows may result in water quality deterioration including an increased in phosphate concentration, in ammonia concentration and in biological oxygen demand (see River Gt Ouse (Grafham Water) EAR Appendix A). Phosphate concentration and the associated low dissolved oxygen problems that result from eutrophication and algal blooms, as well as elevated ammonia levels, are the main water quality concerns in the River Great Ouse. During periods of low flow, the river will have a lower dilution capacity. As a result, the concentrations of nutrients, metals and biochemical oxygen demand are likely to increase slightly downstream of the Offord intake during implementation of a drought permit. The impact is predicted to be more pronounced in summer than in	

[59] Natural England (2015). European Site Conservation Objectives: supplementary advice on conserving and restoring site features. Ouse Washes Special Area of Conservation (SAC) Site Code: UK0013011. Natura 2000, 1-12.

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring (applicable to the entire assessment)
			winter. However, WRC discharges and flow inputs from tributaries will increase the dilution capacity further downstream. No water quality impact assessment was undertaken for the Old Bedford River associated with the Ouse Washes SAC. However, as the Environment Agency transfer water from the tidal river into the counter drain at the Old Bedford Sluice for subsequent abstraction by the Internal Drainage Board for spray irrigation, Old Bedford River could be exposed to water quality changes during drought permit operation. Therefore, identified deteriorations in water quality in Reach 2 will also be applied to the Old Bedford River, associated with the Ouse Washes SAC. Implementation of the drought permit may therefore result in AEoI upon the water quality and nutrients of the SAC. Mitigation measures should be implemented.	
	Conservation measures	Maintain management or other measures (within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and supporting processes associated with the feature and its supporting habitat	The SIP threat relevant to spined loach is water pollution caused by increased nutrient exposure during flooding. As the drought permit will not be operational during high flows, no flooding will be caused by Offord intake and therefore, no AEoI are anticipated on conservation measures. Potential AEoI have been identified on supporting macrophyte habitats during reduced flows. Therefore, implementation of the drought permit may result in AEoI upon the conservation measures of the SAC. Mitigation measures should be implemented.	

5.9 APPROPRIATE ASSESSMENT: OUSE WASHES SPA AND RAMSAR SITE

5.9.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 21.** The following qualifying features have been taken forward to the AA:

- A037 Bewick's swan (Non-breeding)
- A038 Whooper swan (Non-breeding)
- A050 Eurasian wigeon (Non-breeding)
- A051 Gadwall (Breeding)
- A052 Eurasian teal (Non-breeding)
- A053 Mallard (Breeding)
- A054 Northern pintail (Non-breeding)
- A055 Garganey (Breeding)
- A056 Northern shoveler (Non-breeding, Breeding)
- A082 Hen harrier (Non-breeding)
- A151 Ruff (Breeding)
- A156a Black-tailed godwit (Breeding)
- Waterbird assemblage
- Breeding bird assemblage

Ouse washes Ramsar site (see Annex-1: Screening assessment tables**, Table AN- 21**) is designated for the following features taken through to the AA:

- Good representative example of a natural or near-natural wetland characteristic of its biogeographic region. It is one of the most extensive areas of seasonally flooding washland of its type in Britain, and the wetland has high conservation value for many plants and animals.
- The site supports numbers of nationally rare plants and animals. This includes several nationally scarce plants, including, small water pepper *Polygonum minus*, whorled water-milfoil *Myriophyllum verticillatum*, greater water parsnip *Sium latifolium*, river water-dropwort *Oenanthe fluviatilis*, fringed water-lily *Nymphoides peltata*, long-stalked pondweed *Potamogeton praelongus*, hair-like pondweed *Potamogeton trichoides*, grass-wrack pondweed *Potamogeton compressus*, tasteless water-pepper *Polygonum mite* and marsh dock *Rumex palustris*. Invertebrate records indicate that the site holds good relict fenland fauna, including the National Red Data Book species, large darter dragonfly Libellula fulva and the rifle beetle Oulimnius major. The site also supports a diverse assemblage of nationally rare breeding waterfowl associated with seasonally flooding wet grassland.
- Internationally important waterfowl assemblage (greater than 20,000 birds).
- Over winter the site regularly supports internationally important populations of: Bewick`s Swan, gadwall, pintail, shoveler, teal, whooper swan and wigeon.

Theoretical pathways for effect exist as a result of the River Gt Ouse (Grafham Water) Drought Permit through:

- potential water flow reduction during operation of the drought permit operation.
- potential deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation following the operation of the drought permit.

5.9.2 Site Summary

5.9.2.1 Site Description

Ouse Washes SPA and Ramsar site (centred on OS grid reference TL50849028) cover respectively 2,499ha and 2,519ha (sharing similar boundaries). The Ouse Washes is a flood storage reservoir, approximately 30km

long and 1km wide, constructed in the 17th century to drain an extensive area of the fens. It encompasses two canalised main river channels of the River Great Ouse that run each side of its length, and an extensive area of wet grassland and field drains in between. It lies between Earith to the south and Downham Market to the north.

The Ouse Washes is the largest area of washland habitat remaining in the country, subject to regular winter flooding. The soils of the washes are slightly base-rich deep peats, with a high silt content from floodwaters, which overlie Jurassic clays. In the summer months the low-lying grasslands provide grazing and hay, the frequent field drains both helping to keep groundwater levels high deep into the breeding season and also providing stock control as wet fences. The regular winter flooding and the continuance of traditional management of cattle grazing and hay cutting maintains the nature conservation value of the area. It is of particular note for the large numbers of wintering wildfowl and breeding waders it supports, for the large area of unimproved neutral grassland communities which it holds, and for the richness of the aquatic fauna and flora within the associated ditches and drainage channels. Wildfowling takes place across parts of the Ouse Washes.

The Ouse Washes SPA was designated in 1993 under the EU Directive on the Conservation of Wild Birds. The boundary of the SPA largely follows that of the Ouse Washes SSSI, and overlaps with the Ouse Washes SAC, notified for spined loach. The nature reserves at Wildfowl and Wetlands Trust (WWT) Welney and Royal Society for the Protection of Birds (RPSB) Ouse Washes form part of the SPA.

5.9.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.9.2.2.1 Ruff (Breeding)

At notification in 1996, the SPA supported an average of 57 individuals had been recorded lekking[60]. This number increased to 137 individuals when the citation was updated in 2015[61].

According to Natural England Conservation Advice for Protected Sites: Ouse Washes SPA[62]: '*RSPB and WWT breeding bird counts suggest that breeding numbers were lower (mean of 6 during the 10 years immediately prior to notification). No confirmed breeding attempts have been made at the Ouse Washes since 1999. Although lekking still occurs nearby, there have only been four confirmed breeding records in the country between 2006 and 2015. While the habitat at the Ouse Washes may well no longer be suitable, research into ruff migration has shown that there is another likely cause for the decline of breeding ruff in Britain unrelated to habitat suitability of the breeding sites. There has recently been a large increase in the population breeding in Siberia and a corresponding decrease 5 of 157 in the population breeding in western Europe. This large-scale redistribution of breeding ruff may be due to the diminished quality of staging posts in Europe, where birds go to feed after travelling from their wintering sites in West Africa before carrying on to their breeding sites, rather than diminished quality of breeding sites. Although the recent research suggests that ruff is able to make large changes to their migration routes and breeding sites within a relatively short space of time. Breeding ruff are unlikely to return to Britain in such numbers as before unless there is restoration of good quality wet grassland that can be used for feeding by migrating ruff in the Netherlands.'*

5.9.2.2.2 Bewick's swan (Non-breeding)

The abundance of Bewick's swan in the UK is monitored through the Wetland Bird survey (WeBS) and the International Census of the Northwest European population carried out every five years by WWT. The 9th census undertaken in January 2020 recorded a total of 1,290 individuals in Britain and Ireland[63], which represents a decline of 70.6% compared with the total recorded in 2015 and is the lowest census total to date (i.e. a total of 4,371 individuals in Britain and Ireland were recorded in 2015, representing a decline of 38% compared with the 2010 data[64], and was the lowest since the peak in 1990). In Britain, the majority of the birds were recorded in Norfolk and Cambridgeshire.

At notification, the SPA supported 4,980 individuals (29% of the north-west European wintering population and 70% of the British wintering population) and the Ramsar site supported 1,140 individuals (3.9% of the

[60] Natural England (2014). Ouse Washes SPA Citation. Accessed at European Site Conservation Objectives for Ouse Washes SPA - UK9008041.

[61] JNCC, (2015). Natura 2000 Standard Data Form. Accessed at https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9008041.pdf

[62] Information from Natural England Conservation Advice for Protected Sites: Ouse Washes SPA.

[63] Wildfowl Wetland Trust (WWT), (2021), *Waterbirds counters join forces to help with the International Swan Census*, from the WeBS News Issue 37 (Autumn 2021). https://issuu.com/british_trust_for_ornithology/docs/websnews37forweb/12.

[64] WWT, (2021). *Goose & Swan Monitoring Programme: survey results 2019/20 Bewick's Swan Cygnus columbianus bewickii* . WWT/JNCC/NatureScot, Slimbridge.

population, 5-year peak mean 1998/99-2002/03). The 5-year peak mean from 2013/14 - 2017/18 was 1,897. Both the north-west European population and numbers occurring within Britain have declined substantially during the last 20 years[65,66] and the majority of British SPAs show short-, medium- and long-term WeBS alerts for Bewick's swan. The declines are 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 in the African Eurasian Waterbird Agreement (AEWA) Single Species Action Plan[67], including 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.

Bewick's are the smallest swans to visit Europe from their breeding grounds in Russia. Supporting habitats include intertidal mudflats and sandflats, and saltmarshes. While deeper and more persistent winter flooding may affect and inhibit foraging opportunities, evidence suggests that Bewick's swans have always roosted on the Ouse Washes but foraged mainly on the surrounding agricultural land[68]. A review of the WeBS data for the Ouse Washes[69] shows that the Bewick's swan population has decreased considerably with a 5-year average of 123 individuals recorded between 2019/2020-2023/2024. Numbers have largely dropped between 2018/2019 and 2019/2020 from over 1,00 individuals to less than 200 individuals.

5.9.2.2.3 Whooper swan (Non-breeding)

The site supported 590 individuals at SPA notification, 3% of the British population. The peak 5 year mean from 2013/14 - 2017/18 was 6840. The national trend is similar. Like Bewick's swans, whooper swans tend to feed on nearby agricultural land during the day and roost on the washes at night; the location depends on the depth of floodwater and will change through the season.

5.9.2.2.4 Hen harrier (Non-breeding)

The five-year average noted in the 1992 SPA citation was 12 individuals (1982 - 1987). Hen harriers are noted during WeBS counts by the RSPB and WWT, and during the most recent period (from 2013/14 to 2017/18), 1 bird was resident two years out of five. There is no national trend available for wintering hen harriers with which to compare the change in numbers at the Ouse Washes, although Dobson et al. (2012) found the wintering population of hen harriers in Britain to be closely allied to the breeding population; the breeding population in the UK is about the same as it was in the 1980s, although the most recent surveys show a decline since 2004 (Wotton et al. 2018). Without further investigation it is difficult to judge how much the change in numbers at the Ouse Washes is due to site effects. The displacement of small mammals and few places to perch or roost during deep floods may be causing hen harriers to move elsewhere. A confidential study of wintering hen harriers found roosting opportunities at the Ouse Washes to be plentiful during the winter of 2011/12 (Dobson & Carrington-Cotton 2012), but this was a year with relatively low water levels.

5.9.2.2.5 Eurasian wigeon (Non-breeding)

The site supported 38000 individuals at notification, 5% of the north-west European population and 15% of the British population. The peak 5 year mean from 2013/14 - 2017/18 was 24498. Since notification, the British population has increased approximately threefold. Wigeon is a dabbling duck that feeds on rooted vegetation and the increased depth and extent of flooding may be the reason that the population has declined at the Ouse Washes. Natural England (2015) found a strongly significant negative correlation between the annual flooding depth and extent and the peak WeBS counts of wigeon on the Ouse Washes since 1971.

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[65] Rees E.C and Beekman J.H (2010) Northwest European Bewick's swan: a population in decline. British Birds 103: 640-650

[66] Holt C.A, et al., (2015) Waterbirds in the UK 2013/14: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford. http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report.

[67] Nagy S. et al, (2012). International Single Species Action Plan for the Conservation of the Northwest European Population of Bewick's Swan (*Cygnus columbianus bewickii*). AEWA Technical Series No. 44. Bonn, Germany.

[68] Rees et al., (1997). Site selection by swans wintering in Britain and Ireland: the importance of habitat and geographic location, 139, 337-352.

[69] WeBS Report online accessed at https://app.bto.org/webs-reporting/numbers.jsp

5.9.2.2.6 Gadwall (Breeding)

The site supported 111 breeding pairs at the time of SPA notification, 20% of the British population. The mean population count in the period 2010-14 was 120 pairs. UK breeding numbers have been increasing rapidly recently (Woodward et al 2018).

5.9.2.2.7 Eurasian teal (Non-breeding)

The site supported 4100 individuals at notification, 1% of the north-west European population and 4% of the British population. The peak 5 year mean from 2013/14 - 2017/18 was 6185. 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 will change throughout the season.

5.9.2.2.8 Mallard (Breeding)

The site supported 850 breeding pairs at the time of SPA notification, 2% of the British population. The mean population count in the period 2010-14 was 381 pairs. Breeding numbers in the UK have risen since notification, although they have been stable since 2000 (Woodward et al 2018).

5.9.2.2.9 Northern pintail (Non-breeding)

The site supported 1450 individuals at notification, 2% of the north-west European population and 6% of the British population. The peak 5 year mean from 2013/14 - 2017/18 was 667. Numbers have fluctuated and show a roughly similar pattern to the national trend, but the decline nationally (which is short-term and not understood, although possibly due to an increasing tendency for birds to winter further east) has been smaller than the decline evident at the Ouse Washes. Pintail is a dabbling duck, and even though it feeds predominantly on fruits and seeds (Thomas 1982) that can often be gathered from the water surface during a flood, it seems likely that it will prefer shallower water than is available on the Ouse Washes throughout most winters.

5.9.2.2.10 Garganey (Breeding)

The site supported 14 breeding pairs at the time of notification, 20% of the British population. The mean population count in the period 2010-14 was 8 pairs. UK breeding numbers have increased slightly in the last 25 years[70].

5.9.2.2.11 Northern shoveler (Breeding)

The site supported 155 breeding pairs at the time of notification, representing 12% of the British population. The mean population count in the period 2010-14 was 121 pairs. Breeding numbers in the UK have been stable since notification (Holling and the Rare Breeding Birds Panel 2017, JNCC SPA Species Account).

Duck species will nest along the whole length of the protected site. The northern end of the site tends to be less affected by flooding within the breeding season, and the vegetation changes that have resulted from that, and will often support a greater density of nests.

5.9.2.2.12 Northern shoveler (Non-breeding)

The site supported 750 individuals at notification, 2% of the north-west European population and 8% of the British population. The peak 5 year mean from 2013/14 - 2017/18 was 845. Numbers nationally have doubled over the same period.

5.9.2.2.13 Black-tailed godwit (Breeding)

The site supported 26 breeding pairs at the time of notification, representing 44% of the British population. The population on the Ouse Washes has decreased as the nearby population on the Nene Washes has increased. No nesting has occurred on the Ouse Washes itself since 2013, but the 'lifeboat sites', areas of habitat suitable for breeding waders that have been created adjacent to the boundary of the Ouse Washes close to Manea and the WWT reserve at Welney, have supported a small number of breeding pairs since then. Numbers have been as low as two pairs, but there has been breeding success in the form of fledged chicks, and numbers of breeding pairs are starting to rise. In 2018 there were 8 breeding pairs.

[70] Holling and the Rare Breeding Birds Panel, 2017

5.9.2.2.14 Breeding bird assemblage (Breeding)

Those species mentioned on the citation but which have not already been covered as individually qualifying species are listed below. Another waterbird of particular importance not mentioned on the citation is spotted crake.

The following shows 5 year mean numbers of breeding pairs at SPA notification and the most recent numbers available (2010 - 2014).

Mean no. of breeding pairs at notification:

- Oystercatcher: 8.1
- Redshank: 157.1
- Snipe: 550.0
- Lapwing: 153.0
- Mute swan: 34.0
- Shelduck: 41.4
- Teal: 15.5
- Pintail: 0.75
- Pochard: 10.0
- Tufted duck: 55.5
- Moorhen: 69.8
- Coot: 74.3

Mean no. of breeding pairs 2010 - 2014:

- Oystercatcher: 4.8
- Redshank: 163.2
- Snipe: 96.8
- Lapwing: 152.8
- Mute swan: 31.4 7 of 157
- Shelduck: 23.2
- Teal: 26.4
- Pintail: 0.8
- Pochard: 1.4
- Tufted duck: 19.4
- Moorhen: 17.4
- Coot: 61

5.9.2.2.15 Waterfowl assemblage (description taken from the SACO[71])

The main component species of this non-breeding waterfowl assemblage which are not already covered in the preceding sections and which are present in either nationally important numbers or comprise 20,000 or more individuals are:

Cormorant *Phalacrocorax carbo*: Like other species, cormorants tend to use the RSPB and WWT reserves over other areas in the wildfowling season. After the wildfowling season they tend to be found in highest numbers close to Earith or close to Welney; this is likely to be due to clusters of fisheries nearby, which the cormorants visit to feed during the day. They can be found in all WeBS sectors of the Washes, however.

Mute swan *Cygnus olor*: Mute swans tend to be fairly evenly distributed over all WeBS sectors of the Washes throughout the wintering period, even within the wildfowling season. They are likely to feed on nearby arable fields during the day.

Gadwall *Anas strepera*: During the wildfowling season, gadwall are mainly found on the reserves where no wildfowling takes place. Once the wildfowling season has ended they are equally distributed across the site. They occur in larger numbers later in the winter.

Pochard *Aythya farina*: During the wildfowling season, pochard are mainly found on the reserves where no wildfowling takes place. Once the wildfowling season has ended they are equally distributed across the site. They occur in larger numbers later in the winter.

[71] Natural England, (2023) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Ouse Washes SPA.

Tufted duck *Aythya fuligula*: During the wildfowling season, tufted duck are mainly found on the reserves where no wildfowling takes place. Once the wildfowling season has ended they are equally distributed across the site. They occur in larger numbers later in the winter.

Coot *Fulica atra*: During the wildfowling season, coot are mainly found on the reserves where no wildfowling takes place. Once the wildfowling season has ended they are equally distributed across the site. They occur in larger numbers later in the winter.

The average peak count for numbers of wintering waterfowl in the period 2009/10 - 2013/14 was 79839 (Holt et al. 2015), more than the number given in the SPA citation (60950) which is the five-year average from 1986/87 to 1990/91. WeBS trends are not currently available for waterbird assemblage numbers countrywide; an approximation has been made by summing the peak waterfowl numbers from the 50 UK sites with the highest number of waterfowl since winter of 1990/91, taken from the Wildfowl and Wader Counts and the Wetland Bird Surveys produced by the BTO (http://www.bto.org/volunteer-surveys/webs/publications/websannual-report/waterbirds-in-the-uk), which suggests that over the same period there has been a small increase in numbers nationally.

The following shows the main component features of the waterbird assemblage that are not notified for their individual importance.

Peak 5 year mean at notification

- Cormorant: 270
- Mute swan: 490
- Gadwall: 320
- Pochard: 2100
- Tufted duck: 860
- Coot: 2320

Peak 5 year mean 2013/4 - 2017/18

- Cormorant: 136
- Mute swan: 397
- Gadwall: 599
- Pochard: 1829
- Tufted duck: 1730
- Coot: 2730

5.9.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 21**, Ouse Washes SPA and Ramsar site are legally underpinned by one SSSI, Ouse Washes SSSI. Its condition is detailed in **Annex-2**Annex-2: SSSI Detailed Condition Data:

> Ouse Washes SSSI: 15.73% Favourable, 84.27% unfavourable - No change (condition last assessed in 2024).

Unit 22 of the SSSI encompasses the River Great Ouse located within Reach 2.

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Ouse Washes SIP[72] and specifically associated with the qualifying features requiring AA:

> Inappropriate water levels: Habitat creation to offset historical decline of wintering and breeding birds and other strategies to alleviate flooding.
>
> Water Pollution: Implementation of Diffuse Water Pollution plan to tackle inappropriate levels of nutrients from flooding

There are no SIP for the Ouse Washes Ramsar site.

[72] Natural England (2014). Site Improvement Plan: Ouse Washes. Site Improvement Plan: Ouse washes - SIP160

5.9.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets, developed for Ouse Washes SPA and Ramsar site, is provided in **Table 5-9**. The assessment of effects from the proposed drought permit on qualifying features designated within the Ouse Washes SPA has been divided by breeding and non-breeding species, this division also corresponds with the seasonality of the species with breeding species being more present at the site in the summer period (April-September) and the non-breeding species being more present in the winter period (October-January). This approach has been taken to reduce repetition and to streamline the assessment process.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 30.** Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

Table 5-9: AA against relevant attributes and targets taken from the SACO for Ouse Washes SPA and Ramsar site

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Non-Breeding Species:				
Bewick's swan	Population abundance	Restore the size of the non-breeding Bewick's Swan population at a level which is above an average of 4,980 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent	**Population abundance, Population structure and extent and distribution of supporting habitat** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians and small mammals. Reduced flows during operation of Offord intake and potential deteriorations in water quality as a result of the drought permit could have adverse effects on food availability for waterfowl assemblages of the SPA and Ramsar site. However, given the non-breeding status of the qualifying features and that the populations utilise the SPA more in the winter months when the changes resulting from the drought permit would be "minor" in Stage 1 and "minor" in Stage 2, it can be concluded that there would be no AEoI of the Ouse Washes SPA and Ramsar site as a result of changes to population abundance, population structure or extent and distribution of supporting habitats. **Water quality / quantity and Water area/depth:** Reduced flow during operation of Offord intake may cause increases in nutrient concentrations in the River Great Ouse. As orthophosphates are currently above the attribute target of <0.1 mg/l the long-term implications on macrophyte and	The following monitoring and mitigation measures should be implemented to avoid any AEoI upon the SPA. **Baseline monitoring (ongoing):** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites (see River Gt Ouse (Grafham Water) EAR Appendix C for locations). • EA and Anglian Water to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites (see River Gt Ouse (Grafham Water) Appendix C for locations). • Fish monitoring at a number of locations, including reaches potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare (see River Gt Ouse (Grafham Water) Appendix C for locations).
	Population structure	Maintain overall adult survival and body condition at a level which is consistent with maintaining the abundance of the population at or above its target level.		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Water area/water depth	Maintain the number of large waterbodies of optimal size (typically >10ha). Maintain the availability of water of <1m deep, over at least 50% of the total water area.		
	Extent and distribution of supporting non-breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)		
	Connectivity with supporting habitats	Maintain the safe passage of birds commuting between roosting and feeding areas		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Conservation measures	Restore 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.	macroinvertebrate abundance and diversity may be negatively impacted. However, given the non-breeding status of the qualifying features and that the populations utilise the SPA more in the winter months when the changes resulting from the drought permit would be "minor" in Stage 1 and "minor" in Stage 2, and given that the New Bedford River which runs from the Bedford Ouse at Earith to the River Great Ouse at Denver is tidal, hydrological impacts within Reach 2 are likely to be alleviated by the tidal influence from the Wash. Details of the anticipated changes resulting grom the drought permit are shown in Annex-3: Potential changes to physical environment. It can therefore be concluded that there would be no AEoI of the Ouse Washes SPA and Ramsar site as a result of changes to water quality/quantity and water area/depth. **Conservation measures:** The drought action will not impact on inappropriate water levels that cause flooding during high flows but it may reduce wetted habitat availability during summer months when hydrological impacts will be most severe. However, as previously mentioned, these qualifying features are non-breeding wintering species and will not be as present in the	• Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years (see River Gt Ouse (Grafham Water) **Appendix C** for locations). • Initial consultation with stakeholders, including the Environment Agency and Natural England. • Data on bird counts within the Nene Washes Estuary is available from the Water Bird Survey (WeBS)[74]. This data will be examined regularly to determine if there is any negative change to the population densities for designated populations within the SPA and Ramsar site. **Drought Level 1 drought permit measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats during the drought level 1 period. Results to be captured by annotated walkover maps and completion of a 'River Conditions
	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. Maintain abundance and diversity of aquatic macrophytes and grass fields.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
	Landscape	Maintain an open and unobstructed terrain in the vicinity of feeding or roosting areas. Maintain view lines in feeding and roosting areas. Unrestricted views over 500m and effective field size greater than 5ha.		
Whooper swan	Population abundance	Maintain the size of the non-breeding Whooper Swan population at a level which is above an average of 590 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall adult survival and body condition at a level which is consistent with maintaining the abundance of the population at or above its target level.		

[74] WeBS BTO WeBS Reports

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.	summer months when hydrological impacts will be most severe. Therefore, a conclusion of no AEoI can be drawn for changes to conservation measures. **Food availability within supporting habitat:** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians and small mammals. Reduced flows and potential deteriorations in water quality as a result of the drought permit therefore, could have adverse effects on food availability for waterfowl assemblages of the SPA and Ramsar site. Eutrophication could compromise food availability for bird populations of the Ouse Washes SPA and Ramsar site by causing deterioration in the cover of submerged macrophytes and associated invertebrates. However, these qualifying features will be mostly present in the winter months when eutrophication is uncommon due to the conditions being less conducive to excessive nutrient growth[73]. Additionally, given the tidal nature of the River Great Ouse, no AEoI of the Ouse Washes SPA and Ramsar site resulting from the drought permits are anticipated. **Pathogens, Air quality, Connectivity with supporting habitats, Minimising disturbance caused by human activities and Landscape:**	Observation Form - Low Flows' form. • Walkover surveys during the drought level 1 will monitor the current hydrological, water quality and habitat conditions. These surveys incorporate elements of the River Habitat Survey (RHS) and include identification of ecological features such as key fish habitats and notes any potential risks within the reach. Spot water quality monitoring and flow monitoring via ADCP at key locations to provide up to date data on conditions. Additionally, continuous monitoring of fish passes to monitor water levels, in order to determine the current conditions of fish passage throughout the reach. • Regular liaison with the Environment Agency and Natural England. **During drought permit implementation:** • Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems. • Walkovers to include water quality spot sampling in priority areas such as pools and weirs
	Water area/water depth	Maintain the number of large waterbodies of optimal size (typically >10ha). Maintain the availability of water of <1m deep, over at least 50% of the total water area.		
	Extent and distribution of supporting non-breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding). During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)		
	Connectivity with supporting habitats	Maintain the safe passage of birds commuting between roosting and feeding areas		
	Conservation measures	Restore 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.		
	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. Maintain abundance and diversity of aquatic macrophytes and grass fields.		

[73] Environment Agency (2016) Climate change and eutrophication risk in English rivers.

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean	It is not anticipated that the proposed drought permit will result in impacts that will adversely affect pathogens, air quality connectivity with supporting habitats or landscape. Additionally, it is not anticipated to increase the frequency or intensity of disturbance due to human activities. Therefore, a conclusion of no AEoI has been reached.	where aquatic species may become isolated during low flows. • In-stream water quality monitoring in the form of spot sample measures using handheld meters. • Monitoring of key existing river flow site via ADCP spot measurements. • Regular liaison with the Environment Agency and Natural England. • Temporary abstraction reduction. • Temporary abstraction cessation. • Cessation rules for the drought permit are proposed in River Gt Ouse (Grafham Water) Appendix C in response to monitoring targets during operation of the drought permit. **Post drought permit implementation measures:** • Continued monitoring of key existing water quality sites via spot sampling. • Continued monitoring of key existing river flow site via ADCP spot measurements.
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
	Landscape	Maintain an open and unobstructed terrain in the vicinity of feeding or roosting areas. Maintain view lines in feeding and roosting areas. Unrestricted views over 500m and effective field size greater than 5ha.		
Eurasian wigeon	Population abundance	Restore the size of the non-breeding Wigeon population at a level which is above an average of 38,000 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Overall adult survival and body condition is at a level which is consistent with maintaining the abundance of the population at or above its target level.		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Water area/water depth	Restore the availability of water of optimal depth, typically 0.1-0.3m deep. Restore flood conditions so that no more than 80% of the area is covered by water.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Extent and distribution of supporting non-breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding). During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		• Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare. • Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years.
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Connectivity with supporting habitats	Maintain the safe passage of birds commuting between roosting and feeding areas. Restore the availability of grasslands in close proximity (typically <50m) to open water bodies.		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain high cover/abundance of suitable grassland for feeding (short, fine grasses with herbaceous species).		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Landscape	Maintain an open and unobstructed terrain in the vicinity of feeding or roosting areas. Maintain view lines in feeding and roosting areas. Unrestricted views over 500m and effective field size greater than 5ha.		
	Vegetation characteristics	Maintain a sward height of 50-150mm by November. Maintain a sward height on the barrier banks of <100mm in November. Maintain long sward over 10-15% of individual fields to act as seed collecting area and provide vegetation for feeding in deep flood years.		
Eurasian teal	Population abundance	Maintain the size of the non-breeding Teal population at a level which is above an average of 4,100 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall adult survival and body condition at a level which is consistent with maintaining the abundance of the population at or above its target level.		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Water area/water depth	Restore the availability of water of optimal depth, typically 0.1-0.3m deep. Restore flood conditions so that no more than 80% of the area is covered by water.		
	Extent and distribution of supporting non-breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)		
	Connectivity with supporting habitats	Maintain the safe passage of birds commuting between roosting and feeding areas		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain high cover/abundance of preferred food plants (e.g. *Polygonum, Eleocharis, Rumex, Ranunculus*) and key prey species (e.g. flies, caddisfly, beetles, bugs).		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean.		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
	Vegetation characteristics	Maintain a sward height of 50-150mm by November. Maintain a sward height on the barrier banks of <100mm in November. Maintain long sward over 10-15% of individual fields to act as seed collecting area and provide vegetation for feeding in deep flood years.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Northern pintail	Population abundance	Restore the size of the non-breeding Pintail population at a level which is above an average of 1450 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall adult survival and body condition at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Water area/water depth	Restore the availability of water of optimal depth, typically 0.1-0.3m deep. Restore flood conditions so that no more than 80% of the area is covered by water.		
	Extent and distribution of supporting nonbreeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Connectivity with supporting habitats	Maintain the safe passage of birds commuting between roosting and feeding areas		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain a high cover/abundance of preferred food plants (aquatic macrophyte and emergent plants).		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
	Vegetation characteristics	Maintain a sward height of 50-150mm by November. Maintain a sward height on the barrier banks of		
Northern shoveler	Population abundance	Maintain the size of the non-breeding Shoveler population at a level which is above an average of 750 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall adult survival and body condition is at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water area/ water depth	Restore the availability of water of optimal depth, typically 0.1-0.3m deep. Restore flood conditions so that no more than 80% of the area is covered by water.		
	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain high cover/abundance of preferred food plants and prey (surface plankton, and also small molluscs, insects and larvae, seeds and aquatic plant material).		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Vegetation characteristics	Maintain a sward height of 50-150mm by November. Maintain a sward height on the barrier banks of		
Hen/Northern harrier	Population abundance	Restore the size of the non-breeding Hen Harrier population at a level which is above an average of 11 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall adult survival and body condition is at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Restore the distribution, abundance and availability of key prey items (e.g. mammals, birds) at preferred prey sizes (pipits to gamebirds; voles to young rabbit size).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
Waterbird assemblage (non-breeding)	Assemblage abundance	Maintain the size of the waterbird assemblage at a level which is above an average of 60,950 individuals, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Assemblage structure	Maintain overall adult survival and body condition of the birds comprising the assemblage at a level which is consistent with maintaining the abundance of the assemblage at or above its target level		
	Diversity of species	To achieve a high degree of species diversity within the water-bird assemblage, restore the overall number of the main assemblage-component species, and the average size of each of their populations. The noted component species of the wintering waterbird assemblage that are not notified as individual features, all of which were present at nationally important numbers at notification, are: Cormorant (Phalacrocorax carbo), mute swan (Cygnus olor), gadwall (Anas strepera), pochard (Aythya farina), tufted duck (Aythya fuligula), and coot (Fulica atra).		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Water area/ water depth	Restore the availability of water of optimal depth, typically 0.1-0.3m deep. Restore flood conditions so that no more than 80% of the area is covered by water.		
	Extent and distribution of supporting nonbreeding habitat	Restore the extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, and feeding) During the winter months the habitats within the Washes should be a combination of shallow water (no more than 30 cm deep) and short wet grassland. Deeper water should be confined to		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		scrapes, hollows, pools and ditches, with areas of water greater than 10 ha present across the site.		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. snails, chironomids, water beetles, caddisfly larvae, bugs) at preferred prey sizes. Maintain a high cover/abundance of preferred food plants (e.g. Potamogeton, Sparganium, Scirpus, Carex, Glyceria, Rumex, Ranunculus spp., Ceratophyllum, Najas).		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affect the feature.		
	Vegetation characteristics	Maintain a sward height of 50-150mm by November. Maintain a sward height on the barrier banks of		
	Quality of supporting non-breeding habitat	Restore the structure, function and availability of the following habitats which support the main component species of the assemblage feature for all stages (moulting, roosting, loafing, feeding) of the non-breeding period. Habitats likely to be important for the waterbird assemblage are: Offsite arable land Shallow		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		waterbodies Waterbodies larger than 10 ha Short sward wet grassland		
Breeding Species				
Gadwall	Population abundance	Maintain the size of the breeding Gadwall population at a level which is above an average of 111 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	**Population abundance, Population structure and extent and distribution of supporting habitat** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians and small mammals. Reduced flows during operation of Offord intake and potential deteriorations in water quality as a result of the drought permit could have adverse effects on food availability for waterfowl assemblages of the SPA and Ramsar site. Given the breeding status of the qualifying features and that the populations utilise the SPA more in the summer months when the changes resulting from the drought permit would be "moderate" in Stage 1 and "major" in Stage 2, it can be concluded that there is potential for AEoI on integrity of the Ouse Washes SPA and Ramsar site as a result of changes to population abundance, population structure or extent and distribution of supporting habitats. Mitigation and monitoring measures should be implemented. **Water quality / quantity and Water area/depth:** Reduced flow during operation of Offord intake may cause increases in nutrient	The following monitoring and mitigation measures should be implemented to avoid any AEoI upon the SPA. **Baseline monitoring (ongoing):** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites (see River Gt Ouse (Grafham Water) Appendix C for locations). • EA and Anglian Water to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites (see River Gt Ouse (Grafham Water) Appendix C for locations). • Fish monitoring at a number of locations, including reaches potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare (see River Gt Ouse
	Population structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the population at or above its target level.		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting non-breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports the features for all stages (courtship, nesting, feeding) of the breeding cycle as follows: Water-filled scrapes (for feeding), field drains and swamps. Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of preferred food plants (aquatic macrophyte and emergent plants, a variety of seeds).	concentrations in the River Great Ouse. As orthophosphates are currently above the attribute target of <0.1 mg/l the long-term implications on macrophyte and macroinvertebrate abundance and diversity may be negatively impacted. Given the breeding status of the qualifying features and that the populations utilise the SPA more in the summer months when the changes resulting from the drought permit would be greatest. It can therefore be concluded that there is potential for AEoI on integrity of the Ouse Washes SPA and Ramsar site as a result of changes to water quality/quantity and water area/depth. Mitigation and monitoring measures should be implemented. **Conservation measures:** The drought action will not impact on inappropriate water levels that cause flooding during high flows but it may reduce wetted habitat availability during summer months when hydrological impacts will be most severe. As previously mentioned, these qualifying features are breeding species more present in the summer months when hydrological impacts will be most severe. Therefore, a conclusion of potential for AEoI can be drawn for changed to conservation measures. Mitigation and monitoring measures should be implemented.	(Grafham Water) Appendix C for locations). • Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years (see River Gt Ouse (Grafham Water) Appendix C for locations). • Initial consultation with stakeholders, including the Environment Agency and Natural England. **Drought Level 1 drought permit measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats during the drought level 1 period. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form. • Walkover surveys during the drought level 1 will monitor the current hydrological, water quality and habitat conditions. These surveys incorporate elements of the River Habitat Survey (RHS) and include identification of ecological
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May		
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance within close proximity of moulting, loafing, foraging and roosting areas does not reach levels which significantly affects the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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).	**Food availability within supporting habitat:** Waterfowl assemblages feed on a range of food sources including macrophytes, invertebrates, amphibians and small mammals. Reduced flows and potential deteriorations in water quality as a result of the drought permit therefore, could have adverse effects on food availability for waterfowl assemblages of the SPA and Ramsar site. Eutrophication could compromise food availability for bird populations of the Ouse Washes SPA and Ramsar site by causing deterioration in the cover of submerged macrophytes and associated invertebrates. Therefore, there is potential for AEoI of the Ouse Washes SPA and Ramsar site. Mitigation and monitoring measures should be implemented. **Pathogens, Air quality, Grazing animals, Minimising disturbance caused by human activities, Predation, Landform and Landscape:** It is not anticipated that the proposed drought permit will result in impacts that will adversely affect pathogens, air quality, grazing animals, predation, landform and landscape. Additionally, it is not anticipated to increase the frequency or intensity of disturbance due to human activities. Therefore, a conclusion of no adverse effect has been reached.	features such as key fish habitats and notes any potential risks within the reach. Spot water quality monitoring and flow monitoring via ADCP at key locations to provide up to date data on conditions. Additionally, continuous monitoring of fish passes to monitor water levels, in order to determine the current conditions of fish passage throughout the reach. Regular liaison with the Environment Agency and Natural England. **During drought permit implementation:** • Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems. • Walkovers to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows. • In-stream water quality monitoring in the form of spot sample measures using handheld meters. • Monitoring of key existing river flow site via ADCP spot measurements.
	Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas that are typically		
Mallard	Population abundance	Restore the size of the breeding Mallard population at a level which is above an average of 850 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports the features for all stages (courtship, nesting, feeding) of the breeding cycle as follows: Water with abundant invertebrate life (for feeding), tall vegetation nearby (for nesting) Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Conservation measures	Restore 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		• Regular liaison with the Environment Agency and Natural England. • Cessation rules for the drought permit are proposed in River Gt Ouse (Grafham Water) Appendix C in response to monitoring targets during operation of the drought permit. **Post drought permit implementation measures:** • Continued monitoring of key existing water quality sites via spot sampling. • Continued monitoring of key existing river flow site via ADCP spot measurements. • Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare. • Macrophyte, macroinvertebrate and diatom monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years.
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. snails, chironomids, water beetles, caddisfly larvae, bugs) at preferred prey sizes. Maintain a high cover/abundance of preferred food plants (e.g. *Potamogeton, Sparganium, Scirpus, Carex, Glyceria, Rumex, Ranunculus spp., Ceratophyllum, Najas*).		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May.		
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas doesn't reach levels which significantly affect the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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).		
	Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas that are typically		
Garganey	Population abundance	Restore the size of the breeding Garganey population at a level which is above an average of 14 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of	Restore the extent, distribution and availability of suitable breeding habitat which supports the features for all stages (courtship, nesting, feeding) of the breeding cycle		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	supporting breeding habitat	as follows: Shallow pools (for feeding), tall grass in close vicinity of feeding areas (for nesting) Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. snails, chironomids, water beetles, caddisfly larvae, bugs) at preferred prey sizes. Maintain a high cover/abundance of preferred food plants (e.g. *Potamogeton, Sparganium, Scirpus, Carex, Glyceria, Rumex, Ranunculus spp., Ceratophyllum, Najas*).		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May.		
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas does not reach levels which significantly affect the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases.		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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).		
	Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas that are typically		
Northern shoveler	Population abundance	Restore the size of the breeding Shoveler population at a level which is above an average of 155 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Population structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports the features for all stages (courtship, nesting, feeding) of the breeding cycle as follows: Water with shallow margins and plenty of macrophytes (for feeding), tall grass (for nesting) Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain high cover/abundance of preferred food plants and prey (surface plankton, and also small molluscs, insects and larvae, seeds and aquatic plant material).		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas does not reach levels which significantly affect the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases.		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Vegetation characteristics	Maintain the overall heights of vegetation patches (20-60 cm) within nesting areas that are typically		
Ruff	Population abundance	Restore the size of the breeding Ruff population at a level which is above an average of 5 lekking males, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the population at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting breeding habitat	Restore suitable habitat for ruff nesting: Wet grassland with a short but variable sward of fine grasses and herbaceous species with a mean height of 5 cm and shallow floods covering 15-20% of the area at the beginning of April, and groundwater table within 20 cm of the surface over 50% of the area between April and June. Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. dipteran flies, beetles, earthworms) at preferred prey. Restore the distribution, abundance and availability of key prey items (particularly earthworms in the pre-breeding period, and above-ground terrestrial invertebrates (such as dipteran flies, beetles) thereafter at preferred prey sizes.		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May.		
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas does not reach levels which significantly affect the feature.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases.		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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)		
	Landscape	Maintain the amount of open and unobstructed terrain in the vicinity of nesting, roost and feeding sites. Maintain view lines in feeding and roosting areas. Unrestricted views over 200m and effective field size greater than 10ha.		
	Vegetation characteristics	Maintain grassland sward to a height of approximately 5 cm or less on the 1st April, with occasional longer tussocks. Maintain scrub to ensure that it is not used as a perch for predators within areas suitable for wader nesting. Restore vegetation communities in areas important for breeding waders to diverse communities with fine grasses, not dominated by Glyceria maxima, large sedges, or other species indicating waterlogging, through more regular management if necessary. Maintain short/limited vegetation in scrapes so that they continue to hold water over time.		
Black-tailed godwit	Population abundance	Restore the size of the breeding Black-tailed Godwit population at a level which is above an average of 26 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		
	Population structure	Restore overall breeding productivity and adult survival is to a level which is consistent with maintaining the abundance of the population at or above its target level		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		
	Extent and distribution of supporting breeding habitat	Restore suitable habitat for black-tailed godwit nesting: Wet grassland with a short but variable sward of fine grasses and herbaceous species with a mean height of 5 cm and shallow floods covering 15-20% of the area at the beginning of April, and groundwater table within 20 cm of the surface over 50% of the area between April and June. Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. dipteran flies, beetles, earthworms) at preferred prey. Restore the distribution, abundance and availability of key prey items (particularly earthworms in the pre-breeding period, and above-ground terrestrial invertebrates (such as dipteran flies, beetles) thereafter at preferred prey sizes.		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas does not reach levels which significantly affect the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases.		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Landscape	Maintain the amount of open and unobstructed terrain in the vicinity of nesting, roost and feeding sites. Maintain view lines in feeding and roosting areas. Unrestricted views over 200m and effective field size greater than 10ha.		
	Vegetation characteristics	Maintain grassland sward to a height of approximately 5 cm or less on the 1st April, with occasional longer tussocks. Maintain scrub to ensure that it is not used as a perch for predators within areas suitable for wader nesting. Restore vegetation communities in areas important for breeding waders to diverse communities with fine grasses, not dominated by Glyceria maxima, large sedges, or other species indicating waterlogging, through more regular management if necessary. Maintain short/limited vegetation in scrapes so that they continue to hold water over time.		
Breeding bird assemblage	Assemblage abundance	Restore the presence of the breeding bird assemblage and each of its component species, whilst avoiding deterioration from its current level of abundance as indicated by the latest mean peak count or equivalent. The noted component species of the breeding bird assemblage that aren't notified as individual features are: Oystercatcher (Haematopus ostralegus), redshank (Tringa tetanus), snipe (Gallinago gallinago), lapwing (Vanellus vanellus), mute swan (Cygnus olor), shelduck (Tadorna tadorna), teal (Anas crecca), pintail (A. acuta), pochard (Aythya farina), tufted duck (Aythya fuligula), moorhen (Gallinula chloropus) and coot (Fulica atra).		
	Assemblage structure	Maintain overall breeding productivity and adult survival at a level which is consistent with maintaining the abundance of the assemblage feature at or above its target level		
	Pathogens	[Restrict OR Reduce] the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, and their impacts.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Extent and distribution of supporting breeding habitat	Restore the extent, distribution and availability of suitable breeding habitat which supports the features for all stages (courtship, nesting, feeding) of the breeding cycle for the following species: Gadwall: Water-filled scrapes (for feeding), field drains and swamps Mallard: Water with abundant invertebrate life (for feeding), tall vegetation nearby (for nesting) Garganey: Shallow pools (for feeding), tall grass in close vicinity of feeding areas (for nesting) Shoveler: Water with shallow margins and plenty of macrophytes (for feeding), tall grass (for nesting) Restore suitable habitat for black-tailed godwit and ruff nesting: Wet grassland with a short but variable sward of fine grasses and herbaceous species with a mean height of 5 cm and shallow floods covering 15-20% of the area at the beginning of April, and groundwater table within 20 cm of the surface over 50% of the area between April and June. Target communities are MG9 (at least 76 ha), MG13 (at least 285 ha), with S5 and S28 also present but without defined minimum areas. The total area of MG9, MG13, S5 and S28 should be at least 874 ha. Black and Veatch (2008).		
	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore 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.		
	Food availability within supporting habitat	Anas strepera; Gadwall (Breeding and Non-breeding): Maintain the distribution, abundance and availability of preferred food plants (aquatic macrophyte and emergent plants, a variety of seeds). Anas querquedula; Garganey (Breeding): Maintain the distribution, abundance and availability of key prey items (e.g. snails, chironomids, water beetles, caddisfly larvae, bugs) at preferred prey sizes. Maintain a high cover/abundance of preferred food		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		plants (e.g. Potamogeton, Sparganium, Scirpus, Carex, Glyceria, Rumex, Ranunculus spp., Ceratophyllum, Najas). Anas clypeata; Northern shoveler (Breeding and Non-breeding): Maintain high cover/abundance of preferred food plants and prey (surface plankton, and also small molluscs, insects and larvae, seeds and aquatic plant material) Philomachus pugnax; Ruff (Breeding), Limosa limosa limosa; Black-tailed godwit (Breeding) and all breeding waders as part of the assemblage: Maintain the distribution, abundance and availability of key prey items (e.g. dipteran flies, beetles, earthworms) at preferred prey Restore the distribution, abundance and availability of key prey items (particularly earthworms in the pre-breeding period, and above-ground terrestrial invertebrates (such as dipteran flies, beetles) thereafter at preferred prey sizes		
	Grazing animals	Maintain stocking densities within breeding areas at no more than 0.75 livestock units per hectare between 01 April and 31 May		
	Hydrology/flow	Restore water control with floods covering no more than 30% of the site by the beginning of April, gradually reducing over the summer months without further flooding. Maintain water levels in ditches, with high summer retention levels achieved in March and continuing through the summer. Restore the water levels in scrapes and natural depressions so that they are between 0.2 and 0.3 m depth at the beginning of the breeding season (1st April) over at least 50% of the area, which gradually reduces over the following two months. Maintain high water tables, within 20 cm of the surface over at least 50% of the site, providing surface water and damp field conditions between April and June, with 20-30% of the area soggy or flooded overall.		
	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		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		conditions to support the feature. Soluble reactive phosphorus < 0.1 mg/l annual mean		
	Minimising disturbance caused by human activity	Ensure the frequency, duration and/or intensity of disturbance in the vicinity of nesting and foraging areas does not reach levels which significantly affect the feature.		
	Predation	Maintain or reduce levels of chick and nest predation, increasing levels of predator control if predation increases		
	Landform	Maintain shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes. Maintain an abundance of sufficient 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)		
	Landscape	Maintain the amount of open and unobstructed terrain in the vicinity of nesting, roost and feeding sites. Maintain view lines in feeding and roosting areas. Unrestricted views over 200m and effective field size greater than 10ha.		
Extensive areas of seasonally-flooding washland	Not applicable for Ramsar sites	Not applicable for Ramsar sites	The ZoI for this drought permit includes the Ouse Washes, which overlaps Reach 2. The hydrological impact assessments have concluded the following: Stage 1: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 19.3%-19.6% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 30.2% reduction during summer Q99 flows is anticipated, and 8.7% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR Appendix A).	No mitigation nor monitoring measures are deemed necessary with regards to the extensive areas of seasonally-flooding washland at the Ouse Washes Ramsar site. The Drought Permit alone is not anticipated to result in adverse effects upon the Ramsar site.

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			Stage 2: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 15.3%-16.9% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 26% reduction during summer Q99 flows is anticipated, and 6.9% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR Appendix A). As the drought permit proposed will be operational during low flows a hydrological impact assessment was not deemed necessary, The required seasonal flooding of the Ramsar site will not be adversely affected by the drought permit as water abstraction will only take place at times of low flow and will not be drawn at periods of flood. Therefore, no adverse effects to extensive areas of seasonally flooded washlands within the Ouse Washes Ramsar site are anticipated.	
Nationally scarce plants and invertebrate species	Not applicable for Ramsar sites	Not applicable for Ramsar sites	The ZoI for this drought permit includes the Ouse Washes, which overlaps Reach 2. The hydrological impact assessments have concluded the following: Stage 1: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 19.3%-19.6% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 30.2% reduction during summer Q99 flows is anticipated, and 8.7% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR Appendix A). Stage 2: In Reach 1 and Reach 2, reduction in flow regime during annual Q99 is anticipated. In Reach 1, a 15.3%-	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			16.9% reduction during summer and winter Q99 flows is anticipated. In Reach 2, a 26% reduction during summer Q99 flows is anticipated, and 6.9% during winter Q99 flows (see River Gt Ouse (Grafham Water) EAR Appendix A). Additionally, there are anticipated to be no ground water impacts as a result of the drought permit and0 the required seasonal flooding of the Ramsar site will not be adversely affected by the drought permit as water abstraction will only take place at times of low flow and will not be drawn at periods of flood. Therefore, no adverse effects to nationally scarce plants and invertebrate species within the Ouse Washes Ramsar site are anticipated.	

5.10 APPROPRIATE ASSESSMENT: RIVER WENSUM SAC

5.10.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 11**. The following qualifying features have been taken forward to the AA:

- H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- S1096 Brooke lamprey
- S1163 Bullhead
- S1092 White clawed crayfish
- S1016 Desmoulin's whorl snail

Theoretical pathways for effect exist as a result of the Costessey (Heigham WTW) Drought Permit through:

- potential groundwater levels drop-dawn during operation of the drought permit.
- potential extended groundwater level recovery following the operation of the drought permit.

5.10.2 Site Summary

5.10.2.1 Site Description

The River Wensum SAC and SSSI is a nationally and internationally designated site of ecological importance. It extends across 71km of the River Wensum's 73km length, including the reaches directly hydrologically connected to the Costessey groundwater source. The Wensum SAC is recognised as one of the UK's best examples of a naturally enriched calcareous lowland river, supporting a diverse aquatic plant community, a rich invertebrate fauna, and a relatively natural river corridor.

The upper Wensum is predominantly groundwater-fed, with springs emerging from the underlying chalk. This groundwater input, combined with calcareous soils, enriches the water with nutrients and supports dense beds of submerged and emergent vegetation characteristic of a chalk stream system. Downstream, the river's geology transitions to boulder clay and river gravels, contributing to a mosaic of sediment types and habitats.

5.10.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.10.2.2.1 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation

Ranunculion and *Callitricho* plant communities are wide spread within the Wensum and are characteristic of its high ecological status. Their distribution and health are flow-dependent, particularly reliant on sufficient water depth and velocity to prevent sediment smothering and to sustain optimal light penetration.

5.10.2.2.2 Bullhead and Brook lamprey

Both species are confirmed within the Wensum catchment. They utilise shallow gravel and marginal habitats for spawning and refuge. Their presence within the reaches adjacent to the Costessey groundwater source has been confirmed through routine fish monitoring.

5.10.2.2.3 White-clawed crayfish

Historically recorded within the Wensum, white-clawed crayfish are now considered to have a restricted distribution, with population pressures from invasive signal crayfish (*Pacifastacus leniusculus*) and crayfish plague. Whilst there are no recent records of white-clawed crayfish within the Wensum in either NBN gateway or the EA Fish and Ecology Data Explorer, a precautionary approach has been adopted on the basis of the historic records and suitability of habitat present. However, given the historic records and suitability of habitats within the potentially impacted reaches a precautionary approach remains appropriate.

5.10.2.2.4 Desmoulin's whorl snail

Designated as a qualifying feature of the SAC, Desmoulin's whorl snail has not been recorded in recent surveys, and no suitable habitat was identified within the surveyed reaches, as detailed in Section B1.2.3 of Costessey (Heigham WTW) EAR Appendix B.

5.10.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 11**, River Wensum SAC is legally underpinned by one SSSI, River Wensum SSSI. Its condition is detailed in **Annex-2**Annex-2: SSSI Detailed Condition Data:

- River Wensum SSSI: 11.05% favourable, 44.68% unfavourable- recovering, 44.27% unfavourable-declining

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the River Wensum SAC SIP[75] and specifically associated with the qualifying features requiring AA:

- Water pollution:
  - Ensure measures identified in the Diffuse Water Pollution Plan are implemented to address pollutants associated with runoff from road networks and the land in the catchment; and
  - Further investigate or identify actions required to meet the conservation objective for pollutants, to be implemented in the third round of River Basin Management Planning (RBMP3) from 2021.
- Water abstraction:
  - Ensure measures identified in water companies AMP schemes are implemented;
  - Ensure measures identified in the Restoring Sustainable Abstraction Programme are implemented; and
  - Further investigate or identify actions required to meet the conservation objective for flow, to be implemented in the third round of River Basin Management Planning (RBMP3) from 2021.

5.10.3 Assessment of Effects

An assessment of effects against the relevant Supplementary advice to the conservation objectives (SACO) attributes and targets is provided in **Table 5-10**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 31**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[75] Natural England (2014). Site Improvement Plan: Wensum. Site Improvement Plan: River Wensum - SIP198

Table 5-10: AA against relevant attributes and targets taken from the SACO for River Wensum SAC

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
H3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Extent of the feature associated with the site	Restore the extent of the H3260 feature as determined by natural river habitat function and processes.	*Water flow regime (flow velocity, wetted width, depth)* Hydrological impact assessments of the River Wensum within the previous application submitted in 2022 predicted: • Reach 2: minor reduction in flow velocity, wetted width and depth up to 10.0% (summer). • Reach 3: minor reduction in flow velocity, wetted width and depth up to 12.0% (summer) and 10.1% (winter). These minor and short-term changes are not expected to alter channel form, substrate composition or sediment dynamic, and therefore no significant changes are anticipated. Therefore, there will be no AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. *Groundwater levels* An additional drawdown of 4 to 5m in comparison to baseline groundwater levels is anticipated considering the worst-case scenario during operation. Due to the correlation between the ground water levels and the River Wensum, a reduction in groundwater levels is likely to impact the water flow. However, as detailed above, these changes are minor and unlikely to impact the qualifying features significantly. Therefore, there will be no AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. *Water chemistry* Phosphate concentration has been recorded within the three reaches of the River Wensum between 2014 and 2024. Although orthophosphate has been identified to demonstrate sensitivity to changes in flows in this reach, the risk of deterioration to orthophosphate during drought permit implementation is considered: Reach 1: negligible in summer and in winter.	**Baseline Monitoring:** • Ongoing routine river flow, physico-chemical water quality, macroinvertebrate, macrophyte, diatom and fish monitoring conducted by the Environment Agency (EA). • Ad hoc surveys including spot flow gauging and water quality sampling. • Where possible, borehole and well assessments should consider the feasibility of installing automatic water level logging devices. **Drought Level 1 measures:** • Walkover surveys for the identification of the extent and location of flow sensitive habitats. • Water quality spot monitoring and flow monitoring at key locations. **During drought permit implementation measures** • During drought permit implementation surveys will be undertaken to monitor changes to sensitive features during implementation of the drought action. The same methodologies as on-set monitoring will be applied including environmental and water quality monitoring. • Gradual or temporary adjustments to abstraction or compensation flows to prevent stranding, displacement, or
	Biotope (habitat mosaic)	Restore the extent and pattern of in-channel and riparian habitats to that characteristic of natural fluvial processes.		
	Biological connectivity	The natural movement of characteristic river fauna and flora should not be artificially constrained.		
	Sediment regime	Restore the natural supply of coarse and fine sediment to the river.		
	Water course flow	Restore the natural flow regime of the river, with daily flows as close to what would be expected in the absence of abstractions and discharges ('the naturalised flow'). Targets: Agreed RBMP goals by 2027 (Interim 2021 goal). Wensum U/S of Norwich (Units 47-55): Low flows 10% (10-15%); Low-moderate flows 15% (15%); Moderate-high flows 20% (20%); High flows 10% (20%); Tat (units 45 & 46); Low flows 5% (5- 10%); Low-moderate flows 10% (10%); Moderate-high flows 15% (15%); High flows 15% (15%); Low flows Qn 10.		
	Water chemistry - alkalinity	Maintain natural levels of alkalinity.		
	Water quality - acidification	Maintain levels of acidity at the following levels; ANC: Mean ANC >80, pH (Clear waters with DOC 6.54, pH (Humic waters with DOC 5.1.		
	Water quality - nutrients	Restore the natural nutrient regime of the river, with any anthropogenic enrichment above natural/background concentrations		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		limited to levels at which AEoI on characteristic biodiversity are unlikely. Soluble Reactive Phosphorus (SRP) CSM by 2027 (Interim goal by 2021). Main river below Sculthorpe Mill 30 (50) µgl-1. River Tat and River Wensum above Sculthorpe Mill 20 (40) µgl-1.	Reach 2: minor in summer and negligible in winter. Reach 3: negligible in summer and in winter. Therefore, implementation of the drought permit in the summer may result in minor impacts upon phosphate concentrations within Reach 2. Therefore, there is potential for AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation and monitoring measures should be implemented.	stress in sensitive aquatic species (e.g. fish, macroinvertebrates). Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration (fish). • Regular inspection and clearing of screens and fish return channels to ensure they retain their correct working function (fish may collect in deeper forebays with greater flowand cover during drought conditions). • Relocation of fish to suitable habitat where they are observed to be in distress or in artificially high densities with the potential for associated impacts. Work to be carried out in consultation with the EA or NE. • Gradual, temporary reduction of abstraction or temporary cessation of abstraction will be the primary, preferred mitigation for this drought permit. However, if the ecological situation worsens, then reactive mitigation could escalate to deployment of aerators and/or fish rescue; that is, catch and transfer to refuges. **Post drought permit implementation measures:** • Post-drought monitoring will be undertaken to determine whether the implementation of the drought action has had any long-term effects on any environmental features.
	Water quality - organic pollution	Restore organic pollution levels to the following: 10%ile DO 85% saturation Mean BOD - 1.5 mgl-1.		
	Water quality - other pollutants	Achieve at least 'Good' chemical status (i.e., compliance with relevant Environmental Quality Standards).		
	Vegetation structure: cover of submerged macrophytes	Restore a sufficient proportion of all aquatic macrophytes to allow them to reproduce in suitable habitat and unaffected by river management practices.		
	Fisheries	Maintain fish densities at or to a level at or below the natural environmental carrying capacity of the river, and below historical levels (this means no stocking to previously unstocked rivers or river sections). Trout stocking should not elevate densities of adult trout (stocked plus natural) to more than 1-3 fish 100m-2, this being the estimated range of natural trout densities in SAC rivers.	It is not anticipated that the drought permit would result in AEoI on the following attributes of the River Wensum SAC: • Fisheries; • Invasive, non-native and or introduced species; • Key structural, influential and/or distinctive species; • Riparian zone; • Screening of intakes and discharges; • Supporting off-site habitats; • Thermal regime; • Vegetation structure: riparian zone; • Woody debris; and • Air quality.	
	Invasive, non-native and/or introduced 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 are causing minimal damage to the feature.		
	Key structural, influential and/or distinctive species	Restore the abundance of the species listed below to enable each of them to be a viable component of the H3260 feature; *Ranunculus* vegetation esp Stream water-crowfoot *R. penicillatus* ssp. *Pseudofluitans,* thread-leaved water-		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		crowfoot *R. trichophyllus* and fan-leaved water-crowfoot *R. circinatus* *Vertigo moulinsiana*; Desmoulin's whorl snail *Austropotamobius pallipes*; White-clawed (or Atlantic stream) crayfish *Lampetra planeri*; Brook lamprey *Cottus gobio*; Bullhead Constant and preferential species of the vegetation communities S3, S4, S5, S7 and S25.		• Enhancement of habitat within the impacted reach (macroinvertebrates, fish, water vole). This should also be designed to provide greater resilience ahead of the next drought. • Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacle (fish). • Restocking using offspring from broodstock from the catchment where monitoring indicates loss of fish abundance or recruitment (fish). • Modification to barriers or flows to improve fish passage across the extend of the effected reaches • The requirement for the implementation of any potential post-drought mitigation options will be discussed with the EA and NE. **Pre-emptive Mitigation** • Walkover inspections of channels and structures to identify any obstructions that can be removed to proactively east navigation and reduce low flow. • AWS to review its planned preventative maintenance in the sewage network to ensure if a storm occurs after a long dry period that the sewerage infrastructure does not block and cause spillage into the river causing water quality problems by unnecessary overflow.
	Riparian zone	Restore a patchy mosaic of natural woody and herbaceous (tall and short swards) riparian vegetation. The riparian zone should be sufficiently wide to act as a healthy and functional habitat zone within the river corridor.		
	Screening of intakes and discharges	All intakes and discharges likely to trap a significant number of individuals of characteristic species are being adequately screened.		
	Supporting off-site habitats	Habitats beyond the site boundary upon which characteristic biological communities of the SAC depend should be restored in a state that does not impair the full expression of the characteristic biota within the site.		
	Thermal regime	Restore a natural thermal regime to the river subject to a changing climate, ensuring that water temperatures should not be significantly artificially elevated.		
	Vegetation structure: riparian zone	Restore grazing activity in the riparian zone and in the river channel to suitably low levels.		
	Woody debris	Restore the presence of coarse woody debris within the structure of the channel (except in upland areas above the natural tree line). In smaller watercourses,		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		temporary debris dams should be a feature of channel dynamics.		• Variable abstraction to create occasional pulses of water through the downstream system. Variable abstraction could be operated on a goodwill basis, working within abstraction licence conditions, once a drought permit application has been submitted and is under consideration by the EA. Prior to drought permit application, AWS will expect to operate as normal within its abstraction licence conditions.
	Air quality	Restore, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
S1096 Brooke lamprey (*Lampetra planeri*)	Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations.	Impacts to the population may occur indirectly through habitat loss or degradation, as a result of potential impacts such as alterations to water levels and flow which can cause drought conditions or water quality deterioration. Reduced water flow could cause nutrient concentrations in the SAC to increase. Water quality deterioration and increased siltation will also impact macrophyte communities used as feeding and sheltering sites for juvenile brook lamprey.eThis could have long term impacts on population size and on juvenile densities within the SAC which in turn may result in AEoI upon the juvenile densities of brook lamprey within the SAC. Therefore, there is potential for AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation and monitoring measures should be implemented.	
	Population abundance	Restore the abundance of the population [to] a level which is close to that expected under unimpacted conditions throughout the site (subject to natural habitat conditions and allowing for natural fluctuations), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. Favourable status ammocoete abundance in chalk stream optimal habitat is >10m-2 and >2m-2 on a catchment basis	Reduced water flow and water quality deterioration could have long term impacts on population size within the SAC and in turn AEoI on the SAC. Therefore, there is potential for AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation and monitoring measures should be implemented.	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Biological connectivity	Restore the connectivity between populations within and upstream of the SAC.	Reduced water flow could impact connectivity between populations upstream and downstream. However, the modelling conducted predicts that hydrological impacts as a result of the drought action will be 'minor'. Therefore, it is unlikely that there will be any AEoI to biological connectivity as a result of the Costessey (Heigham WTW) Drought Permitalone.	
	Biotope mosaic	Restore the extent and pattern of in-channel and riparian habitats to that characteristic of natural fluvial processes.	Implementation of the drought permit is anticipated to have minor to negligible impacts upon flow hydraulics and sediment dynamics. It may impact on the health, diversity and distribution of macrophyte communities that support spined loach populations therefore, resulting in AEoI on the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Sediment regime	Restore sediment regime		
	Flow regime	Ensure more than 90% of the naturalised daily mean flow remains in the river all year round.	The hydrological assessment for the River Wensum concluded that in Reach 1 the impact from the drought permit would 'negligible' in the summer months (reduction of 4.9% and 5.7%) and 'negligible' in the winter months (reduction of 4.7% and 2.1%). For Reach 2 the hydrological impact would be 'minor' in the summer months (reduction of 8.5% and 10.0%) and 'negligible' in the winter months (reduction of 8.2% and 3.8%). Finally, for Reach 3 hydrological impacts would be 'minor' in the summer months (reduction of 10.5% and 12.0%) and 'minor' in the winter months (reduction of 10.1% and 4.7%). As these impacts could reduce the naturalised daily mean flow below the required 90%, there is potential for AEoI on the flow regime within the River Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Water quality - acidification	Restore suitable acidification	Reduction in flows may result in water quality deterioration including an increased in phosphate concentration, in ammonia concentration and in biological oxygen demand (see Costessey	
	Water quality - nutrients	Restore the natural nutrient regime of the river, with any anthropogenic enrichment		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		above natural/background concentrations limited to levels at which AEoI on the feature are unlikely.	(Heigham WTW) EAR **Appendix A**). Phosphate concentration has been recorded within the three reaches of the River Wensum between 2014 and 2024. Although orthophosphate has been identified to demonstrate sensitivity to changes in flows in this reach, the risk of deterioration to orthophosphate during drought permit implementation is considered: Reach 1: negligible in summer and in winter. Reach 2: minor in summer and negligible in winter. Reach 3: negligible in summer and in winter. During periods of low flow, the river will have a lower dilution capacity. As a result, the concentrations of nutrients, metals and biochemical oxygen demand are likely to increase slightly downstream of the intake during implementation of a drought permit. Implementation of the drought permit may therefore result in AEoI upon the water quality and nutrients of the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Control of livestock grazing activity	Restore and control the level of grazing on site	It is not anticipated that the drought permit would have any AEoI on the following attributes of the River Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone: • Control of livestock grazing activities; • Riparian zone; • Fisheries – exploitation; • Fisheries - introduction of fish species; • Integrity of off-site habitats; • Screening of intakes and discharges; • Vegetation composition: invasive non-native species; • Woody debris.	
	Riparian zone	Restore areas of riparian habitat		
	Fisheries - exploitation	All exploitation (e.g., netting or angling) of lamprey species should be undertaken sustainably without compromising any components of the population.		
	Fisheries - introduction of fish species	Ensure fish stocking/introductions do not interfere with the ability of the river to support self-sustaining populations of the feature		
	Integrity of off-site habitats	Restore Integrity of off-site habitats		
	Screening of intakes and discharges	Restore screening of intakes and discharges		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Vegetation composition: invasive non-native species	Control and prevent where possible all invasive non-native species		
	Woody debris	Restore an abundance of large woody debris within the channel or water body.		
S1163 Bullhead (*Cottus gobio*)	Juvenile densities	Restore juvenile densities at those expected under unimpacted conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations.	Impacts to the population may occur indirectly through habitat loss or degradation, as a result of potential impacts such as alterations to water levels and flow which can cause drought conditions or water quality deterioration. Reduced water flow could cause nutrient concentrations in the SAC to increase. Water quality deterioration and increased siltation will also impact macrophyte communities used as feeding and sheltering sites for juvenile bullhead.eThis could have long term impacts on population size and on juvenile densities within the SAC which in turn may result in AEoI upon the juvenile densities of bullhead within the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation and monitoring measures should be implemented.	
	Population abundance	Restore the abundance of the population to a density which is close to that expected under unimpacted conditions throughout the site (subject to natural habitat conditions and allowing for natural fluctuations), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. Favourable status is for adult density of >0.5 individuals m-2 and >40% of individuals in the 0+ age class indicating a suitable age structure and recruitment.	Reduced water flow and water quality deterioration could have long term impacts on population size within the SAC and in turn AEoI on the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation and monitoring measures should be implemented.	
	Biological connectivity	The movement of bullfish within the site should not be artificially constrained.	Reduced water flow could impact connectivity between populations upstream and downstream. However, the modelling conducted predicts that hydrological impacts as a result of the drought action	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			will be 'minor'. Therefore, it is unlikely that there will be any AEoI to biological connectivity as a result of the Costessey (Heigham WTW) Drought Permit alone.	
	Biotope mosaic	Restore the extent and pattern of in-channel and riparian habitats to that characteristic of natural fluvial processes.	Implementation of the drought permit is anticipated to have minor to negligible impacts upon flow hydraulics and sediment dynamics. It may impact on the health, diversity and distribution of macrophyte communities that support spined loach populations therefore, resulting in AEoI on the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Sediment regime	Restore sediment regime		
	Flow regime	Ensure more than 90% of the naturalised daily mean flow remains in the river all year round.	The hydrological assessment for the River Wensum concluded that in Reach 1 the impact from the drought permit would 'negligible' in the summer months (reduction of 4.9% and 5.7%) and 'negligible' in the winter months (reduction of 4.7% and 2.1%). For Reach 2 the hydrological impact would be 'minor' in the summer months (reduction of 8.5% and 10.0%) and 'negligible' in the winter months (reduction of 8.2% and 3.8%). Finally, for Reach 3 hydrological impacts would be 'minor' in the summer months (reduction of 10.5% and 12.0%) and 'minor' in the winter months (reduction of 10.1% and 4.7%). As these impacts could reduce the naturalised daily mean flow below the required 90%, there is potential for AEoI on the flow regime within the River Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Water quality - acidification	Restore suitable acidification	Reduction in flows may result in water quality deterioration including an increased in phosphate concentration, in ammonia concentration and in biological oxygen demand (see Costessey (Heigham WTW) EAR Appendix A). Phosphate concentration has been recorded within the three reaches of the River Wensum between 2014 and 2024. Although orthophosphate has been identified to demonstrate sensitivity to changes in flows in this reach, the risk of deterioration to orthophosphate	
	Water quality - nutrients	Restore the natural nutrient regime of the river s, with any anthropogenic enrichment above natural/background concentrations limited to levels at which AEoI on the feature are unlikely.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			during drought permit implementation is considered: Reach 1: negligible in summer and in winter. Reach 2: minor in summer and negligible in winter. Reach 3: negligible in summer and in winter. During periods of low flow, the river will have a lower dilution capacity. As a result, the concentrations of nutrients, metals and biochemical oxygen demand are likely to increase slightly downstream of the intake during implementation of a drought permit. Implementation of the drought permit may therefore result in AEoI upon the water quality and nutrients of the SAC as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented.	
	Control of livestock grazing activity	Restore and control the level of grazing on site	It is not anticipated that the drought permit would have any AEoI on the following attributes of the River Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone: • Control of livestock grazing activities; • Fisheries – exploitation; • Fisheries - introduction of fish species; • Integrity of off-site habitats; • Riparian zone; • Screening of intakes and discharges; • Vegetation composition: invasive non-native species; • Vegetation structure: cover of submerged macrophytes; • Woody debris.	
	Fisheries - introduction of fish species	Ensure fish stocking/introductions do not interfere with the ability of the river to support self-sustaining populations of the feature.		
	Integrity of off-site habitats	Restore Integrity of off-site habitats		
	Riparian zone	Restore areas of riparian habitat		
	Screening of intakes and discharges	Restore screening of intakes and discharges		
	Vegetation composition: invasive non-native species	Control and prevent where possible all invasive non-native species		
	Vegetation structure: cover of submerged macrophytes	Restore suitable cover of submerged macrophytes		
	Woody debris	Restore an abundance of large woody debris within the channel or water body.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
S1016 Desmoulin's whorl snail (*Vertigo moulinsiana*)	Abundance	Restore a healthy adult: juvenile structure and population density (typically>250 individuals per m² in late summer), whilst avoiding deterioration from current levels as indicated by the latest peak count or equivalent.	A population of Desmoulin's whorl snail was once present within the River Wensum, however several studies since 2017 have confirmed the absence of individuals. This is likely due to a lack of ground moisture which impact the presence of suitable habitat (sedges). An increased water abstraction will impact restoration target towards population abundance and distribution of supporting habitat. Mitigation measures should be implemented. *Water flow regime (flow velocity, wetted width, depth)* As detailed above, the implementation of the drought permit will result in minor reduction in flow velocity, wetted width and depth. Due to the lack of Desmoulin's whorl snail within Reaches 2 and 3, these minor impacts are not considered to have a significant impact upon the population of snail. However, it is understood that measures should be implemented to restore the population. Those restoration measures are likely to be impacted by the implementation of the drought permit. Therefore, there is potential for AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented. *Groundwater levels* An additional drawdown of 4 to 5m in comparison to baseline groundwater levels is anticipated considering the worst-case scenario during operation. Due to the correlation between the ground water levels and the River Wensum, a reduction in groundwater levels is likely to impact the water flow. However, as detailed above, these changes are minor and unlikely to have AEoI on the qualifying features as a result of the Costessey (Heigham WTW) Drought Permit alone. *Water chemistry*	
	Distribution of supporting habitat	Restore 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.		
	Extent of supporting habitat	Maintain the total extent of the habitat(s) which support the feature (at]: Fen, marsh and swamp habitats S3, S4, S5, S7, S25 f 45.9 hectares. Wetter stands of MG8 type communities may also support Desmoulin's whorl snail.		
	Ground moisture	Restore appropriate soil/ground moisture conditions so that water levels are continuously at or just above the ground surface throughout the year.		
	Water flow (rivers)	Restore the natural flow regime of the river, with daily flows as close to what would be expected in the absence of abstractions and discharges (the 'naturalised' flow).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water quantity/quality	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, restore water quality and quantity to a standard which provides the necessary conditions to support the feature/ Phosphate standards for the River Wensum: Main river below Sculthorpe Mill 30 µgl-1. River Tat and River Wensum above Sculthorpe Mill 20 µgl-1.	Orthophosphate has been identified to demonstrate sensitivity to changes in flows in this reach, the risk of deterioration to orthophosphate during drought permit implementation is considered negligible to minor as presented above. As no population of Desmoulin's whorl snail are currently present within the southern reaches, no AEoI of the SAC have been identified as a result of the Costessey (Heigham WTW) Drought Permit alone.	
	Connectivity with other populations	Restore the connectivity between populations within and upstream of the SAC.	It is not anticipated that the drought permit would have AEoI on the following attributes of the River Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone: • Connectivity with other populations; • Vegetation composition - invasive non-native plants; • Vegetation structure; • Adaptation and resilience; • Air quality; • Conservation measures; and • Mosaic of biotopes on floodplains.	
	Vegetation composition - invasive non-native plants	Ensure invasive non-native plants are either rare or absent within the site.		
	Vegetation structure	Restore dense stands of tall vegetation, which is typically >70cms tall by August, with an abundance of tussocks and decaying leaf litter.		
	Adaptation and resilience	Restore 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.		
	Air quality	Restore concentrations and deposition of air pollutants to at or below the site relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		necessary to restore the structure, functions and supporting processes associated with the feature and/or its supporting habitats.		
	Mosaic of biotopes on floodplains	Restore the extent and patterning of In-channel and riparian biotopes which are characteristic of natural fluvial processes. There should be no physical modification of existing conditions which would reduce the connectivity between river and floodplain.		
S1092 White clawed crayfish (*Austropotamobius pallipes*)	Population abundance	Restore the abundance of the population to a level which is above that surveyed by Rogers and Holdich 1997, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	No recent records of white-clawed crayfish have been identified within the River Wensum and the population was impacted in 2015 following an outbreak of crayfish plague. *Water flow regime (flow velocity, wetted width, depth)* As detailed above, the implementation of the drought permit will result in minor reduction in flow velocity, wetted width and depth. These minor impacts are not considered to have a significant impact upon the population of native crayfish. However, it is understood that measures should be implemented to restore the population. Those restoration measures are likely to be impacted by the implementation of the drought permit. Therefore, there is potential for AEoI as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented. *Groundwater levels* An additional drawdown of 4 to 5m in comparison to baseline groundwater levels is anticipated considering the worst-case scenario during operation. Due to the correlation between the ground water levels and the River Wensum, a reduction in groundwater levels is likely to impact the water flow. However, as detailed above, these changes are minor and unlikely to adversely effect the qualifying features significantly. Therefore, there will be no AEoI as a result of the Costessey	
	Oxygen levels	Maintain supporting rivers and waterbodies in/to a well-oxygenated state, typically with a dissolved oxygen standard of >85%.		
	River flow	Ensure more than 90% of the naturalised daily mean flow remains in the river all year round.		
	Water quantity/ quality	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, Restore water quality and quantity to a standard which provides the necessary conditions to support the feature Phosphate standards for the River Wensum: Main river below Sculthorpe Mill 30 µgl-1. River Tat and River Wensum above Sculthorpe Mill 20 µgl-.1		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
			(Heigham WTW) Drought Permit alone. *Water chemistry (phosphate)* Orthophosphate has been identified to demonstrate sensitivity to changes in flows in this reach, the risk of deterioration to orthophosphate during drought permit implementation is considered negligible to minor as presented above. Therefore, the implementation of the drought permit may result in AEoI on white-clawed crayfish if present within the River Wensum as a result of the Costessey (Heigham WTW) Drought Permit alone. Mitigation measures should be implemented. *Water chemistry (oxygen levels)* Dissolved oxygen saturation has been monitored between 2014 and 2024: Reach 1: results consistent with High WFD status (60%). Risk of deterioration during implementation of the drought permit is considered negligible in summer and winter. Reach 2: results consistent with High WFD status (70%), but data collected only in 2023. Risk of deterioration during implementation of the drought permit is considered negligible in summer and winter. Reach 3: results consistent with Good WFD status (60%). Risk of deterioration during implementation of the drought permit is considered negligible in summer and winter. Therefore, the drought permit is unlikely to result in AEoI upon dissolved oxygen saturation within the River Wensum as a result of the Costessey (Heigham WTW) Drought Permit alone.	
	Population health	Restore an absence of individuals within the site infected with crayfish plague or porcelain disease.	It is not anticipated that the drought permit would have any AEoI on the following attributes of the River	

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Population health	Ensure human activities within or around the site do not pose a significant risk of plague transfer.	Wensum SAC as a result of the Costessey (Heigham WTW) Drought Permit alone: • Population health; • Distribution of supporting habitat; • Extent of supporting habitat; • Biological connectivity; • Calcium levels; • Pollution; • River banks; • River bed; • River morphology; • River/ waterbody vegetation; • Shoreline refugia; • Soils, substrate and nutrient cycling; • Supporting off-site habitat; • Total Nitrogen; • Turbidity: rivers; • Un-ionised Ammonia; • Water pH; • Water quality: biological; • Water quality: chemical; • Water temperature; • Woody debris; • Adaptation and resilience; • Air quality; • Conservation measures; and • Fish density.	
	Population health	Restore an absence of non-native crayfish species from the site and the catchment surrounding the site.		
	Distribution of supporting habitat	Restore 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.		
	Extent of supporting habitat	Maintain the total extent of the habitat(s) which support the feature H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation 90.55 hectares or 71km in length.		
	Biological connectivity	The movement of white-clawed crayfish within the site should not be artificially constrained.		
	Calcium levels	Maintain calcium levels at or to above [5mg/l].		
	Pollution	Ensure supporting habitat is not at risk of effluent discharges from agricultural or fish farms from within the site's wider catchment.		
	River banks	Restore the full extent of bankside tree cover including their root systems.		
	River bed	Restore an abundance of naturally occurring cobbles, rubble and boulders on the river bed.		
	River morphology	Restore the physical structure of the river channel and its banks in a natural state.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	River/ waterbody vegetation	Restore the extent of submerged and marginal vegetation within the river channel / standing water body (as appropriate).		
	Shoreline refugia	Restore the extent and diversity of shoreline refuges associated with the water body, such as submerged tree roots, bank crevices and marginal vegetation.		
	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat.		
	Supporting off-site habitat	Restore the quality of any supporting habitat present beyond the site boundary upon which the white-clawed crayfish population of the site depend.		
	Total Nitrogen	Maintain levels typically at or below 0.25 mg.l-1 NO2 suggested as reflecting the EPA limit for salmonid waters.		
	Turbidity: rivers	Maintain an annual mean level of typically less than 25 mg/l of suspended solids throughout the site.		
	Un-ionised Ammonia	Maintain/Reduce ammonia levels at or to less than 0.25mg NH3 l-1 throughout the site.		
	Water pH	Maintain pH levels at or to within the range 6.5 - 9.		
	Water quality: biological	Restore supporting habitat to Good biological status (ie, compliance with relevant Environmental Quality Standards) throughout the site.		
	Water quality: chemical	Restore supporting habitat to Good chemical status (ie, compliance with relevant Environmental Quality Standards) throughout the site.		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
	Water temperature	Maintain water temperature at naturally-occurring levels.		
	Woody debris	Restore an abundance of large woody debris within the channel or water body.		
	Adaptation and resilience	Restore 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.		
	Air quality	Restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).		
	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Restore the structure, functions and supporting processes associated with the feature and/or its supporting habitats.		
	Fish density	Maintain fish populations at or to densities low enough to avoid significant predation of juvenile crayfish.		

5.11 APPROPRIATE ASSESSMENT: RUTLAND WATER SPA AND RAMSAR SITE

5.11.1 Introduction

Screening of qualifying features is provided in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 22.** The following qualifying features have been taken forward to the AA:

- A005 Great crested grebe (Non-breeding)
- A036 Mute swan (Non-breeding)
- A050 Eurasian wigeon (Non-breeding)
- A051 Gadwall (Non-breeding)
- A052 Eurasian teal (Non-breeding)
- A056 Northern shoveler (Non-breeding)
- A061 Tufted duck (Non-breeding)
- A067 Common goldeneye (Non-breeding)
- A070 Goosander (Non-breeding)
- A125 Common coot (Non-breeding)
- Waterbird assemblage (Non-breeding)

Rutland Water Ramsar site (see Annex-1: Screening assessment tables**, Table AN- 22)** is designated for the following features taken through to the AA:

- Assemblage of international importance with 19,274 waterfowl (species with peak mean counts in winter).
- Species/population occurring at levels of international importance in spring/autumn including gadwall and northern shoveler.

Theoretical pathways for effect exist as a result of the River Nene (Rutland Water) Drought Permit through:

- potential deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) following the operation of the drought permit.

5.11.2 Site Summary

5.11.2.1 Site Description

Rutland Water SPA (centred on OS grid reference SK 906 071) cover approximately 1,540ha while Rutland Water Ramsar site is centred on the same grid reference covers 1,360.34ha. The Ramsar site is entirely overlapped by Rutland water SPA and only includes the areas of open water within the eastern section, outside the Nature Reserve area while it roughly follows the SPA boundary within the Nature Reserve (excluding Lax Hill and some woodland parcels).

Rutland Water is a large public water supply reservoir created in 1975. The SPA is located on the River Gwash, a tributary of the River Welland which flows north of Peterborough. Since 1975, it has developed into a major wetland of international importance for waterbirds which are attracted to the large expanses of open water, lagoons, islands, mudflats, reedswamp, marsh, old meadows, pastures, scrub and mature woodland.

The underlying geology is formed of gently dipping Jurassic rocks of limestone, sandstone and ironstone overlain by glacial tills which gives rise to moderately fertile soils composed of loams and clays. As a result, arable farming tends to dominate the plateaux tops while the steep sloping valley sides support more pasture. The prevalence of clays in the Gwash valley helped provide material for the construction of the dam which created Rutland Water.

Rutland Water SPA is also a popular tourist destination as the reservoir is an important venue for water sports, sailing and recreational angling, as well as being very popular with cyclists and walkers. Over 45% of the site is managed by the Leicestershire & Rutland Wildlife Trust and AWS as a nature reserve.

5.11.2.2 Qualifying features screened into Stage 2 AA: baseline and description

5.11.2.2.1 Waterfowl assemblage (description taken from the SACO[76])

From the period July to April each year, the SPA regularly supports a waterbird assemblage where peak counts of more than 20,000 waterbirds are achieved. The species composition of an assemblage may change over time but the following ten species are listed in the SPA citation as named components of this waterbird assemblage leading up to the time of the SPA's classification: gadwall, shoveler, coot, goldeneye, goosander, great crested grebe, mute swan, teal, tufted duck and wigeon.

The SPA's ability to support and sustain an assemblage comprising a very large number of birds (in excess of 20,000) made up of a diverse mix of species will be reliant on the overall quality and diversity of the habitats that support them. Four broad supporting habitats are important for sustaining the waterbird assemblage and its component species through the provision of food, shelter and refuge from human disturbance. These habitats are therefore important for the maintenance of favourable conservation status of the waterbird assemblage. The broad habitats are:

- Open standing water associated with the main reservoir and other adjacent waterbodies.
- Neutral grassland.
- Fen, marsh and swamp associated with the open water.
- Broadleaved, mixed and yew woodland, including wet woodland.

The waterbird assemblage is present within the SPA throughout the year and includes both breeding and non-breeding waterbird populations. However, the SPA is most important during the passage and winter periods when migrants visit the site in internationally important numbers. Numbers of migrants start to build up mainly in July and each waterbird species can achieve peak numbers at any time between September and January. However, individual waterbird species do not synchronously achieve peak numbers in the same month and the size of peak counts can vary from year to year between and within species. This is because some species are more prevalent during the passage periods while others are more common during the winter period, but this can vary depending on specific and general factors, both within and outside the site.

When the SPA was designated in 1991, the baseline waterbird assemblage cited in the citation was 21,050 waterbirds based on the 5-year mean peak count recorded between 1985/86 and 1989/90. Within this period, a minimum peak monthly waterbird assemblage count of 18,560 waterbirds was recorded in 1987/88. This sets the monitoring target for determining favourable condition of the SSSI under Common Standards Monitoring (CSM) protocols. This monitoring target allows for natural fluctuations around the baseline. However, favourable conservation status of the SPA requires a baseline assemblage size to be maintained which is based on the mean peak count over a 5-year period.

All habitats within the SPA are utilised by the non-breeding waterbird assemblage. These range from the areas of shallow open water and adjacent wetlands which are favoured by gadwall, shoveler, teal and mute swan. The grassland is favoured by wigeon while the deeper open water is favoured by goldeneye, goosander, tufted duck, coot and great-crested grebe. The most important areas for waterbirds are found at the far western ends of the upper and lower arms of the reservoir where there are also a number of associated lagoons. These also provide important loafing and roosting areas during times when the majority of the deeper open water in the eastern end of the reservoir is used for water sports, fishing and other recreational activities.

5.11.2.2.2 Wintering species: shoveler, teal, wigeon, gadwall, goldeneye, tufted duck, mute swan, coot, goosander and great crested grebe (description taken from SACO)

Shoveler

Northern shoveler are present within the SPA throughout the year and the site supports both breeding and non-breeding populations. However, it is during the passage and winter periods when migrants northern shoveler visit the site in internationally important numbers. The numbers of migrants begin to build up in August and achieve peak numbers during September to November. From December, numbers can decline quite markedly through to March depending on conditions but may pick up a little in April due to some spring passage. The lowest numbers are recorded mainly during May to July.

[76] Natural England, (2023) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Rutland Water SPA.

When the SPA was designated in 1991, there was a baseline population of 450 individuals based on the 5-yr mean peak count recorded between 1985/86 and 1989/90. This equated to at least 1% of the NW European flyway population and 5% of the British population. Within this period, a minimum annual peak count of 285 birds was recorded in 1987/88 which sets the monitoring target for determining favourable condition of the SSSI under CSM protocols. Favourable conservation status of the SPA requires the baseline population to be maintained which is based on the mean peak count over a 5-year period. Since notification, the annual peak counts of non-breeding northern shoveler have fluctuated from winter to winter, but they have only fallen below the minimum population threshold during 1 of the 25 winters between 1991/92 and 2015/16. This pattern is also reflected in the 5-year mean peak counts where only 1 of 5 mean peak counts fell below the baseline non-breeding population recorded at notification. Overall, the non-breeding population has shown a stable trend since notification. However, in recent years there are signs that the non-breeding population may be declining but at present the longer-term population trends are uncertain.

Northern shoveler prefer shallow, muddy-bottomed wetlands that are rich in invertebrate life and which are associated with lowland marshes and open water-bodies. Such habitats are widespread at Rutland Water but the localised concentrations of non-breeding shoveler reflect the most extensive areas of these habitats within the SPA. These include Burley Fishponds, Heron Bay, Manton Bay, Lagoons 1, 2 and 3, as well as the adjacent areas of shallow water in the North and South Arms. They are specialised feeders which dabble and sift water for seeds of sedges, rushes, pondweeds, algae and duckweeds, as well as aquatic insects, molluscs and crustaceans.

Teal

Overwintering teal mainly feed on the seeds of aquatic plants, grasses and sedges. When the SPA was designated in 1991, there was a baseline population of 1,429 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 1% of the British population. The current non-breeding population within the site is estimated at 1,429 individuals, based on the 5-year peak mean from 2015/16 to 2019/20, which equates to an increase of 25% compared with the population at declaration. The current threshold for national importance is 4,300 individual birds.

Wigeon

The Eurasian wigeon is a bird of open wetlands and usually feeds by dabbling for plant food or grazing, which it does very readily. The species feeds on grassland adjacent to the reservoirs.

When the SPA was designated in 1991, there was a baseline population of 4,380 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 2% of the British population. The current non-breeding population within the site is estimated at 3,978 individuals, based on a 5-year peak mean from 2015/16 to 2019/20, which equates to 9% decline compared with the population at declaration. The current threshold for national importance is 4,500 individual birds.

Gadwall

Gadwall are present within the SPA throughout the year and the site supports both breeding and non-breeding populations. However, it is during the passage and winter periods when migrant gadwall visit the site in internationally important numbers. Migrants start to arrive in June and build up in July and August with peak numbers recorded during September to November. During December to February, the numbers of migrants decline but significant numbers still remain within the SPA. The lowest numbers of gadwall are generally recorded during March, April and May.

When the SPA was designated in 1991, there was a baseline population of 1,320 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to at least 11% of the NW European flyway population and 22% of the British population. Within this period, a minimum peak count of 1,031 birds was recorded in 1986/87 which sets the monitoring target for determining favourable condition of the SSSI under CSM protocols. Favourable conservation status of the SPA requires the baseline population to be maintained which is based on the mean peak count over a 5-year period.

Since notification, the annual peak counts of non-breeding gadwall have fluctuated widely from winter to winter and have fallen below the minimum population threshold on 13 out of 25 winters from 1991/92 to 2015/16. In comparison, the baseline non-breeding population as measured by the 5-year mean peak count has fallen below the notification baseline on 3 out of 5 occasions during this period. However, the non-breeding population is not showing signs of a long-term decline, with peak counts showing a stable but quite widely fluctuating pattern from year to year. In the winter, up to 95% of the gadwall's diet is made up of submerged

aquatic vegetation such as algae, grasses, rushes, sedges, pondweed, and water milfoil, including leaves, stems, roots, and seeds, which this dabbling duck feeds on by up-ending, head-bobbing and by stealing from other birds such as coots. As a result, gadwall favour expanses of shallower water, rich in submerged macrophytes, where there is little or no human disturbance. At Rutland Water, this favoured aquatic habitat is widespread but is mainly concentrated in the more secluded western inflow areas in the north and south arms and in the associated lagoons, both within and outside of the SPA.

Goldeneye

Goldeneye is a medium-sized diving duck that typically forage underwater. They eat crustaceans, aquatic insects and small fish, and will also eat plant material, mainly seeds. Unlike pochard and tufted duck, goldeneye often feed in estuarine waters.

When the SPA was designated in 1991, there was a baseline population of 285 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 2% of the British population. The current population of this species overwintering within the site is estimated at 310 individuals, based on a 5-year peak mean from 2015/16 to 2019/20. Which equates to an increase of 9%, compared with the population at declaration. The current population level is still above the nationally important threshold. The current threshold for national importance is 190 individual birds.

Tufted duck

Tufted duck is a medium-sized diving duck. The species is mainly carnivorous with animal material forming more than 80% of their diet. The diet consists of molluscs, insects and some plants.

When the SPA was designated in 1991, there was a baseline population of 3,230 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 5% of the British population. The current population of this species overwintering within the site is estimated at 5.940 individuals, based on a 5- year peak mean from 2015/16 to 2019/20, which equates to an increase of 84% compared with the population at declaration. The current threshold for national importance is 1,300 individual birds.

Mute swan

Mute swans are the commonest Eurasian swan and they eat aquatic vegetation, which their long necks equip them to take from the bed of the reservoir. They take the molluscs which cling to the vegetation and also eat small fish, frogs and worms. Typically mute swans will graze big grassy fields and winter cereal crops.

Winter cereals growing outside the SPA boundary are probably more important for the species than the grassland both within and outside the site boundary. When the SPA was designated in 1991, there was a baseline population of 200 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 1% of the British population. The current population of this species overwintering within the site is estimated at 485 individuals, based on a 5- year peak mean from 2015/16 to 2019/20, which equates to a 143% increase compared with the population at declaration. The current threshold for national importance is 500 individual birds.

Coot

Coot is a member of the rail and crake bird family. The species is omnivorous, feeding primarily on plant matter such as shoots and seeds of aquatic and some terrestrial plants, algae, grasses and cereals. It also takes animal food such as worms, leeches, molluscs, shrimps, insects (adults and larvae) and spiders.

When the SPA was designated in 1991, there was a baseline population of 4.600 individuals based on the 5-year mean peak count recorded between 1985/86 and 1989/90. This equated to 2% of the British population. The current population of this species overwintering within the site is estimated at 2,812 individuals, based on a 5-year peak mean from 2015/16 to 2019/20, which equates to a 39% decline, compared with the population at declaration. The current threshold for national importance is 2,000 individual birds.

Goosander

Common goosander is a large duck of rivers and lakes in forested areas that eats mainly fish. It nests in holes in trees.

When the SPA was designated in 1991, there was a baseline population of 60 individuals based on the 5-yr mean peak count recorded between 1985/86 and 1989/90. This equated to 1% of British population. The current population of this species overwintering within the site is estimated at 24 individuals, based on the 5-

year peak mean from 2015/16 to 2019/20, which equates to a 60% decline compared to the population at declaration. The current threshold for national importance is 150 individual birds.

Great crested grebe

The great crested grebe is a diving bird mainly feeding on fish. When the SPA was designated in 1991, there was a baseline population of 520 individuals based on the 5-yerr mean peak count recorded between 1985/86 and 1989/90. This equated to 6% of the British population. The current population of this species overwintering within the site is estimated at 641 individuals, based on a 5-year peak mean from 2015/16 to 2019/20, an increase of 23% compared with population at declaration. The current threshold for national importance is 170 individual birds.

5.11.2.3 Condition, threats and pressures

As detailed in Annex-1: Screening assessment tablesAnnex-1: Screening assessment tables**, Table AN- 22**, Rutland Water SPA and Ramsar site are legally underpinned by one SSSI, Rutland Water SSSI. Its condition is detailed in **Annex-2**Annex-2: SSSI Detailed Condition Data:

- Rutland Water SSSI: 100% favourable.

The following pressures / threats with the outlined measures required to improve the condition of the features which are listed within the Rutland Water SIP[77] and specifically associated with the qualifying features requiring AA:

- Water abstraction: explore the possibility of the inclusion of compensation areas within the designation.
- Water pollution: establish a nutrient mass balance for the reservoir.

There are no SIP for the Rutland Water Ramsar site.

5.11.3 Assessment of Effects

An assessment of effects against the relevant SACO attributes and targets, developed for Rutland Water SPA, is provided in **Table 5-11**.

A summary of anticipated impacts upon groundwater levels, baseline flow regime and water quality are provided in Annex-3: Potential changes to physical environmentAnnex-3: Potential changes to physical environment**, Table AN- 29**. Those conclusions have been used to assess the LSE identified at the Stage 1 HRA Screening.

[77] Natural England (2014). Site Improvement Plan: Rutland Water. Site Improvement Plan: Rutland Water - SIP208

Table 5-11: AA against relevant attributes and targets taken from the SACO for Rutland Water SPA and Ramsar site

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Non-breeding species: **Great crested grebe** **Mute swan** **Wigeon** **Gadwall** **Teal** **Shoveler** **Tufted duck** **Goldeneye** **Goosander** **Coot** **Waterbird assemblage**	Population abundance	Maintain the size of the non-breeding population at a level which is consistently at or above: • great crested grebe: 520 individuals • mute swan: 200 individuals • Eurasian wigeon: 4,380 individuals • gadwall: 1,320 individuals • teal: 1,140 individuals • shoveler: 450 individuals • tufted duck: 3,230 individuals • goldeneye: 285 individuals • goosander: 60 individuals • coot: 4,600 individuals And avoiding deterioration from its current level as indicated by the latest 5-year mean peak count or equivalent. Maintain the overall abundance of the non-breeding waterbird assemblage at a level which is consistently at or above 21,050 waterbirds whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	Operation of the drought permit is anticipated to result in moderate to major impacts upon the hydrology of the River Nene, and its water quality (in particular orthophosphate and dissolved oxygen) and minor effects to its geomorphology. However, no hydrological assessment has been carried out upon the Rutland Water Reservoir **Population abundance, extent and distribution of supporting habitat** As the qualifying bird species of Rutland Water are designated as non-breeding populations, exposure to poor water quality as a result of discharged water from the River Nene will impact on the feeding and roosting habitats relied upon during the winter. As dabbling ducks, gadwall for example require shallow foraging habitat at the periphery of the reservoir (particularly in the secluded western inflow areas in the north and south arms) to feed on grasses, rushes, sedges, pondweed and water milfoil. Northern shoveler are similarly shallow feeders, relying on wetlands, lowland marshes and	**Baseline measures (ongoing)** • EA/ Anglian Water to continue monitor river flows, levels and abstraction at key monitoring sites, to identify the trigger for initiating a drought permit application. • Initiation/continue campaigns to reduce the distribution input in the surrounding area. • Carry out regular WQ spot sampling. • Data on bird sighting within the Rutland Nature Reserve is available from the Leicestershire & Rutland Wildlife Trust[78]. This data will be examined regularly to determine if there is any negative change to the population densities for designated populations within the SPA and Ramsar site. **Drought Level 1 measures:** • Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as
	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		

[78] Rutland Water Nature Reserve Annual Wildlife Report: Annual Report 2023a.indd

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding) Habitat extent baselines are provided below as a percentage of the component area of the SPA: • open water: 76% • neutral grassland: 14% • fen, marsh and swamp: 0.01% • Broadleaved, mixed and yew woodland: 8%	open water bodies to feed on aquatic invertebrates, sedges, rushes, pondweeds and duckweeds. In Rutland Water SPA they are often recorded in Burley Fishponds, Heron Bay, Manton Bay and Lagoons 1, 2 and 390.ee **Water quality / quantity:** Rutland Water is currently exceeding the annual mean phosphorus threshold for moderate alkalinity, deep waterbodies of 0.012 mg/l. Diffuse water pollution (DWP) is a key issue potentially affecting all Broads sites and remains one of the priority issues to address in the Broads. There are a variety of sources, pathways and effects, and interactions with climate change. Hence, a variety of solutions is required to address the problem. In many cases measures are required throughout the catchment, rather than within the site or adjacent to the site. This could be having an impact on qualifying bird species such as goosander, mute swan, teal and wigeon. For example, Eurasian teal peak bird count from 2019 – 2020 was 580 in comparison to 1,942 the previous year. Phosphate concentrations in the River Nene are currently above the WFD 'Good' EQS threshold by 0.03 mg/l. It is	weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form. • Contact all licensed abstractors within the potentially affected reach. • Regular liaison with the Environment Agency. **During drought permit implementation measures** • Frequently monitor flow against temporary drought permit MRF and cease abstraction at Wansford if flows drop below MRF. • Enhanced monitoring of water quality and biological community to quantify the immediate impact of the drought and the response of the biological community in the recovery period, including additional water quality monitoring upstream of Wansford. • Records of daily abstraction quantities and flow should be submitted to the Environment Agency every week, as well as an updated reservoir storage projection for Rutland Water. The
	Water area	Maintain the number of waterbodies of optimal size: • great crested grebe: >1ha. • mute swan, tufted duck and goldeneye: >5ha Maintain the availability of water area.		
	Water depth	Maintain the availability of standing water over more than half of the total standing water body area. • great crested grebe: 1-5m deep • mute swan: >1m deep • wigeon, gadwall and coot: <0.25m deep in Burley Fishponds, Heron Bay, Manton Bay, Lagoons 1 to 8, as well as the adjacent areas of shallow water in the North and South Arms. • teal: <0.1m deep		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		• shoveler: <0.3m deep in Burley Fishponds, Heron Bay, Manton Bay, Lagoons 1 to 8, as well as the adjacent areas of shallow water in the North and South Arms. • tufted duck: 2-6m deep • goldeneye:2-4m deep Maintain the availability of standing water of optimal depth for all waterbird assemblage.	important to note, however that the underlying SSSI units and features are all considered to be in favourable condition. Implementation of the proposed drought permit will expose Rutland Water to water supply that may have higher phosphate concentrations, which may cause conditions to further deteriorate and exceed the WFD 'Good' EQS threshold for moderate alkalinity, deep waterbodies. This could cause excessive algal growth, increasing the biochemical oxygen demand within Rutland Water and reducing the suitability of the site to support a high diversity of aquatic vegetation and associated invertebrates. This would not be compliant with the sites Conservation Objectives and mitigation measures are required in order to conclude no adverse effect on qualifying bird populations. This could impact on the cover of submerged macrophytes leading to reductions in food availability for bird populations within the Rutland Water SPA and Ramsar site. Therefore, there is potential for AEoI as a result of the River Nene (Rutland Water) Drought Permit alone. Mitigation and monitoring measures should be implemented.	Environment Agency should be informed if water levels in Rutland Water return to the normal operating curve. **Mitigation measures:** • Variable abstraction at Wansford during one or two 'spate' flow events to flush pollutants and prevent stagnation. • Review AWS planned preventative maintenance to ensure that if a storm occurs after long dry periods the sewage infrastructure does not block and cause overspill to the river. • Cessation rules should be in place to halt abstraction if water quality deteriorates below acceptable levels, or if water levels are affected more than currently predicted. • Continuous flow DO and other parameter (e.g. temperature, pH, conductivity) monitoring and cessation of abstraction if levels fall below a critical value for fish health or if levels are impacted more than predicted. • Surveillance walkover surveys of habitat quality and ecological stress, recording
	Water quality / quantity	Where the supporting habitats of the SPA feature are dependent on surface water ensure water quality and quantity is maintained and managed to a standard which provides the necessary conditions to support the feature during passage and winter periods.		
Great crested grebe	Food availability within supporting habitat	Maintain the availability of key prey species (e.g. bleak, minnows, perch, roach, *Gobius* spp., prawns, shrimps) of preferred prey sizes		
Mute swan	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. hatching midges, molluscs, insects and worms) at preferred prey sizes. Maintain a high cover/abundance of preferred food plants (e.g. *Glyceria fluitans, Rorippa spp., Alopecurus geniculatus*). Maintain a high cover/abundance of preferred food plants (e.g. Potamogeton, Callitriche, *Myriophyllum*, *Chara* spp.).		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
Eurasian wigeon	Food availability within supporting habitat	Maintain high cover/abundance of preferred food plants (e.g. *Polygonum, Eleocharis, Rumex, Ranunculus*), *Agrostis stolonifera*	**Food availability within supporting habitat:** Eutrophication could compromise food availability for bird populations of the Rutland Water SPA and Ramsar site by causing deterioration in the cover of submerged macrophytes and associated invertebrates. Therefore, there is potential for AEoI as a result of the River Nene (Rutland Water) Drought Permit alone. Mitigation and monitoring measures should be implemented.	signs of environmental problems. **Post drought measures:** • Continued flow monitoring in the River Nene to ensure that drought permit actions are no longer required. • Continued water quality and biological community monitoring to assess the need for continuation of mitigation measures.
Gadwall	Food availability within supporting habitat	Maintain a high cover/abundance of the food plants preferred by the feature (e.g. *Glyceria fluitans, Agrostis stolonifera, Chara, Potomageton, Ceratophyllum spp., Ruppia*).		
Teal	Food availability within supporting habitat	Maintain the cover/abundance of preferred food plants (e.g. *Polygonum, Eleocharis, Rumex, Ranunculus*). Maintain the availability of key prey species (e.g. *Hydrobia*, flies, caddisfly, beetles, bugs, hatching midges) of preferred prey sizes.		
Shoveler	Food availability within supporting habitat	Maintain a high cover/abundance of food plants preferred by the feature (e.g. rushes *Scirpus*, *Eleocharis*, sedges *Carex*, pondweeds Potamogeton, sweet-grasses *Glyceria*, surface plankton).		
Tufted duck	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. *Dreissena polymorpha, Mytillus, Cardium* spp, chironomid larvae, *Gammarus*, *Hydrobia*) at preferred prey sizes. Maintain high cover/abundance of preferred food plants (e.g. *Chara*, *Nitella*, Potamogeton spp.).		
Goldeneye	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. *Trichoptera*,		

Qualifying features	Attributes	Target	Potential Effects	Mitigation and Monitoring
		chironomid larvae, *Gammarus*, Asellus) at preferred prey sizes.		
Goosander	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. salmon, perch, trout, eel, carp, perch, rudd, herring, cod, sandeels, chironomid larvae) at preferred prey sizes (e.g.		
Coot	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. *Mytilus*, *Dreissena polymorpha*, caddis-fly larvae, Odonata, Lepidoptera, beetles and bugs) at preferred prey sizes. Maintain the current cover/abundance of preferred food plants (e.g. *Chara, Cladophora, Potamogeton, Ruppia, Ranunculus, Spirogyra, Elodea*).		
Waterbird assemblage	Food availability within supporting habitat	Maintain the distribution, abundance and availability of key prey items (e.g. Hydrobia, crustaceans, caddisflies, diptera, beetles) at preferred prey sizes for the feature.		

5.12 APPROPRIATE ASSESSMENT CONCLUSION

The Appropriate Assessment concluded that the following Habitats Sites would result in no AEoI alone and would not require mitigation:

- Abberton Reservoir SPA and Ramsar Site
- Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site
- Essex Estuary SAC
- Norfolk Valley Fens SAC

The Appropriate Assessment concluded that the following Habitats Sites would require monitoring and mitigation to conclude no AEoI alone:

- Breckland SAC
- Nene Washes SAC, SPA and Ramsar site
- Ouse Washes SAC, SPA and Ramsar site
- River Wensum SAC
- Rutland Water SPA and Ramsar site

An in-combination assessment is required for the following Habitats Sites where residual effects were identified:

- Abberton Reservoir SPA and Ramsar Site
- Breckland SAC
- Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site
- Essex Estuary SAC
- Norfolk Valley Fens SAC
- Nene Washes SAC, SPA and Ramsar site
- Ouse Washes SAC, SPA and Ramsar site
- River Wensum SAC
- Rutland Water SPA and Ramsar site

6. IN-COMBINATION ASSESSMENT

The Stage 1 Screening concluded that the Costessey (Heigham WTW), Lower Colne (Ardleigh Reservoir), River Gt Ouse (Grafham Water), River Nene (Rutland Water) and Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permits could have LSE on Habitats Sites alone or in-combination with other plans and projects. River Nene (Pitsford Water) and River Trent (Hall WTW) concluded no LSE alone on Habitat Sites. However, in-combination low level residual effects between actions and with other plans and projects must be considered. The following Habitats Sites have been included in the in-combination assessment below where no LSE alone was identified, however there was potential for low-level residual effects to act in-combination:

- Costessey (Heigham WTW)
  - Breydon Water SPA and Ramsar site
  - Broadland SPA and Ramsar site
  - The Broads SAC
- River Trent (Hall WTW)
  - Humber Estuary SAC, SPA and Ramsar
- River Nene (Rutland Water)
  - The Wash and North Norfolk Coast SAC
  - The Wash SPA and Ramsar
- River Nene (Pitsford Water)
  - Nene Washes SAC, SPA and Ramsar
  - Upper Nene Valley Gravel Pits SPA and Ramsar
- River Gt Ouse (Grafham Water)
  - Portholme SAC

The Stage 2 AA concluded that with the implementation of monitoring and mitigation measures no AEoI on Habitats Sites were anticipated for the Lower Colne (Ardleigh Reservoir), Costessey (Heigham WTW), River Gt Ouse (Grafham Water), River Nene (Rutland Water) and Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permits alone. However, in-combination low level residual effects between actions and with other plans and projects must be considered. The following Habitats Sites have been included in the assessment below:

- Lower Colne (Ardleigh Reservoir)
  - Abberton Reservoir SPA and Ramsar
  - Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar
  - Essex Estuaries SAC
- Costessey (Heigham WTW)
  - River Wensum SAC
- River Gt Ouse (Grafham Water)
  - Ouse Washes SAC, SPA and Ramsar
- River Nene (Rutland Water)
  - Nene Washes SAC

  - Rutland Water SPA and Ramsar

- Wellington Wellfield (Stoke Ferry & Marham WTW)
  - Breckland SAC
  - Norfolk Valley Fens SAC

6.1 IN-COMBINATION ASSESSMENT BETWEEN DROUGHT PERMITS

This in-combination assessment between drought permits is detailed in **Table 6-1**. The within plan in-combination assessment has been undertaken where LSE in-combination or residual effects at Stage 2 AA have been identified from multiple drought actions on the same Habitats Site.

Table 6-1: Summary of the in-combination assessment between drought permits

Option	In-Combination With	Relevant Habitats Site	Effect In-Combination
River Nene (Rutland Water)	River Nene (Pitsford Water)	Nene Washes SAC, SPA and Ramsar site	**No** – Due to inputs from the Great Billing water recycling centre (WRC), Broadhome WRC and Flag Fen WRC increase water flows downstream of the abstraction point at Pitsford/ Duston Mill intake. Additionally, tributaries between the Pitsford/ Duston Mill and Rutland/ Wansford intake assist in diluting nutrient concentrations in the River Nene. Therefore, no in-combination effects are anticipated.
		The Wash and Norfolk Coast SAC	**No** – Due to structural controls along the River Nene and the input of additional flows from WRCs and tributaries, no in-combination effects are anticipated.
		The Wash SPA and Ramsar site	**No** – Due to structural controls along the River Nene and the input of additional flows from WRCs and tributaries, no in-combination effects are anticipated.
		Rutland Water SPA and Ramsar site	**No** - Due to the contribution of water supplies from connecting tributaries and other discharges that are expected to dilute nutrient concentrations in the River Nene during low flow periods. In addition, Rutland Water is also supplied water via WRCs and tributaries between Pitsford/ Duston Mill and Wansford under drought permit conditions. Previous assessments (Atkins, 2012) also concluded there would be no in-combination effects should drought actions be implementation at the same time. Therefore, no in-combination effects are anticipated.
River Nene (Rutland Water)	Wellington Wellfield (Stoke Ferry & Marham WTW)	The Wash and Norfolk Coast SAC	**No** – As there is negligible hydrological impact from both drought permits on The Wash and Norfolk Coast SAC, no in-combination effects are anticipated.
		The Wash SPA and Ramsar site	**No** – As there is negligible hydrological impact from both drought permits on The Wash SPA and Ramsar site, no in-combination effects are anticipated.

6.2 ANGLIAN WATER'S WATER RESOURCE MANAGEMENT PLAN (2024)

The Anglian Water's Water Resource Management Plan (WRMP) 2024 was published in April 2025, with the HRA appendix published in August 2024[79].

[79] Water resources management plan

AWS has examined the supply/demand balance for each WRZ and determined how any deficits between forecast demand and reliable water supplies should be addressed for the selected planning period. A wide range of alternative actions has been considered by AWS to address any forecast supply shortfalls, including:

- Smart metering
- Leakage options
- Water efficiency measures
- Compulsory metering
- Tariffs
- Non-household demand
- Aquifer storage recovery (ASR)
- Backwash recovery
- Bulk/intra company transfers of treated water
- Conjunctive use- 3rd party
- Desalination
- Drought permit
- Groundwater sources
- New reservoir
- New surface water
- Sea tankering
- Water quality schemes increasing deployable output
- Water reuse

6.2.1 Costessey (Heigham WTW)

The NAY1 Norwich and the Broads to Aylsham potable transfer (scheme included under the WRMP 2024) and Costessey (Heigham WTW) Drought Permit considered the potential LSE on Broadland SPA and Ramsar site and The Broads SAC. LSEs from Norwich and the Broads to Aylsham potable transfer were identified during construction of a new pipeline infrastructure located within 2km of the Habitats Site. Construction could potentially cause physical loss and damage to the habitats, non-physical disturbances, toxic / non-toxic contamination and biological disturbances. The identified impact pathways will be mitigated via pipeline route optimisation, good industry practice, timing of the works and directional drilling. As the impact pathways identified for Costessey (Heigham WTW) are in relation to groundwater supply, no in-combination effects have been identified from Norwich and the Broads to Aylsham potable transfer option and Costessey (Heigham WTW) Drought Permit upon Broadland SPA and Ramsar site and The Broads SAC.

The NTB10 Norfolk Bradenham to Norwich and the Broads potable transfer (20Ml/d) (scheme included under the WRMP 2024) and Wellington Wellfield drought permit considered the potential LSE on the River Wensum SAC, Broadland SPA and Ramsar site and The Broads SAC. LSEs from Norfolk Bradenham to Norwich and the Broads potable transfer were identified during construction of a new pipeline infrastructure which crosses the River Wensum SAC. The pipeline also takes place within 2km of the Broadland SPA and Ramsar site and The Broads SAC. The HRA produced in 2024 concluded that AEoI could be avoided or fully mitigated with the measures it laid out which include pipeline route optimisation, good industry practice, timing of the works and directional drilling. As the impact pathways identified for Costessey (Heigham WTW) are in relation to groundwater supply, no in-combination effects have been identified from Norfolk Bradenham to Norwich and the Broads potable transfer option and Costessey (Heigham WTW) Drought Permit upon River Wensum SAC, Broadland SPA and Ramsar site and The Broads SAC.

6.2.2 Lower Colne (Ardleigh Reservoir)

There is no overlap in Habitats Site considered for the Offord Intake and the Felixstowe Desalination, Ipswich Water Reuse and Pyewipe Water Reuse options.

The EXS19 Colchester Reuse direct to Ardleigh Reservoir new reuse treatment works (scheme included under the WRMP 2024) and Lower Colne (Ardleigh Reservoir) Drought Permit considered the potential LSE on Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site and Essex Estuaries SAC. LSEs from Colchester Reuse direct to Ardleigh Reservoir new reuse treatment works were identified during construction and operation of the treatment works infrastructure. Construction could potentially cause toxic / non-toxic contamination and biological disturbances, operation of the treatment works could potentially cause physical damage and toxic / non-toxic contamination. The identified impact pathways will be mitigated by adhering to good industry practice and following the operational limit constraints for abstraction and brine water discharge in the Anglian River Basin Management Plan (RBMP). As the impact pathways identified for the Lower Colne (Ardleigh Reservoir) Drought Permit are in relation to groundwater supply, no in-combination effects have been identified from Colchester Reuse direct to Ardleigh Reservoir new reuse treatment works the Lower Colne (Ardleigh Reservoir) Drought Permit upon Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site and Essex Estuaries SAC.

6.2.3 River Gt Ouse (Grafham Water)

The FNF29 Fens Reservoir 50MCM (usable volume) (44.4Ml/d) (scheme included under the WRMP 2024) and River Gt Ouse (Grafham Water) considered the potential LSE on Ouse Washes SAC, SPA and Ramsar site, on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. LSEs from Fens Reservoir were identified during construction and operation of a new reservoir. Construction impacts included supporting off-site habitat loss or damage, non-physical disturbance (i.e. noise, vibration, human presence and artificial light), contamination and biological disturbance with the introduction of invasive non-native species (INNS). Impacts to the Ouse Washes SAC from the Fens Reservoir were identified during construction and operation of the new reservoir. Construction impacts included physical habitat loss or damage by converting supporting habitats within the site to built infrastructure and increasing sedimentation and siltation from surface water runoff, toxic/non-toxic contamination where there was risk of pollution during construction and biological disturbance where construction activities involved a risk of introducing INNS to the SAC. Operational effects included physical damage, where activities would risk changes to the hydrological regime and deposition rate of fine sediments, non-toxic contamination where changes to the hydrological regime and decreases in dissolved oxygen may alter supporting processes, and biological disturbance where operation activities increase the risk of mortality and could alter population size. No impacts upon The Wash SPA and Ramsar site, and The Wash and North Norfolk Coast SAC have been identified, it is considered that 'there is sufficient flexibility over the exact location, scale, timing and nature of the option that it can be implemented in a way that will be compliant with the legally binding environmental objectives set out in the river Basin Management Plan'. The identified pathways will be mitigated via a code of construction practice (CoCP), good industry practice, design optimisation (location, silt screening, directional drilling of watercourses, fish screens at the intake). On the basis of the implementation of those mitigation measures, the HRA concluded that 'at the plan level there is confidence adverse effects can be avoided or fully mitigated.' It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon Nene Washes SAC, SPA and Ramsar site, on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site.

The FND22 Marham Abstraction (7.9Ml/d up to 2039, 12.3Ml/d after 2039) (scheme included under the WRMP 2024) and River Gt Ouse (Grafham Water) Drought Permit considered the potential LSE on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. LSEs were identified during construction of a new pipeline, through physical loss/damage to habitat for otters, non-physical disturbance (i.e. noise, vibration, human presence and artificial light), contamination and biological disturbance within the River Nar. LSEs were also identified during operational activities of the new abstraction which may result in changes in flow downstream of the new abstraction location (River Nar) resulting in physical damage, non-physical disturbance for otters, contamination (i.e. changes to water quality including turbidity and sedimentation) and biological disturbance following changes in water quality (i.e. algal blooms). The identified pathways will be mitigated via a CoCP, good industry practice, design optimisation. On the basis of the implementation of those measures, the HRA concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated.'* It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and Ramsar site.

The RTN17 Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (scheme included under the WRMP 2024) and River Gt Ouse (Grafham Water) Drought Permit considered the potential LSE on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and

Ramsar site have been screened out due to their upstream location and therefore considered lack of LSE. No LSEs were identified during the construction of the new reservoir, and LSEs were considered during operational activities. '*The proposed transfer of flows from the River Trent into the upper Witham system will result in increased flows in the River Witham, down to the abstraction at Langrick Bridge (upstream of the Wash).*' It is considered that the operation of the transfer will pose a risk of introducing INNS and hydrological change within the Habitats Site that may alter the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely. The identified pathways will be mitigated by operational limits of abstraction and emergency drawdown discharge constrained by the Anglian River Basin Management Plan (RBMP). The AA conducted for the RTN17 option concluded: '*that the aspects of option design described [in the WRMP] will allow adherence to the RBMP and ensure no adverse effect on site integrity will result from water abstraction or emergency drawdown'*. On the basis of the implementation of those measures, the HRA concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated.'* It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and Ramsar site.

6.2.4 River Nene (Pitsford)

The FNF29 Fens Reservoir 50MCM (usable volume) (44.4Ml/d) (scheme included under the WRMP 2024) and River Nene (Pitsford Water) considered the potential LSE on Nene Wash SAC, SPA and Ramsar. LSEs from Fens Reservoir were identified during construction and operation of a new reservoir. Construction impacts from construction included supporting off-site habitat loss or damage, non-physical disturbance (i.e. noise, vibration, human presence and artificial light), contamination and biological disturbance with the introduction of invasive non-native species (INNS). Impacts upon Nene Wash SAC have been identified during operation of the Fens Reservoir through physical damage (changes to the hydrological regime may result in changes to the deposition rates of fine sediment on gravels), contamination (decrease in dissolved oxygen) and biological disturbance (risk of increasing mortality). Impacts upon Nene Wash SPA and Ramsar have been identified during operation of the Fens Reservoir through potential changes to water quantity within the water table that may alter the supporting processes on which the habitats of qualifying species rely. The identified pathways will be mitigated via a code of construction practice (CoCP), good industry practice, design optimisation (location, silt screening, directional drilling of watercourses, fish screens at the intake). On the basis of the implementation of those mitigation measures, the HRA concluded that 'at the plan level there is confidence adverse effects can be avoided or fully mitigated'. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon Nene Wash SAC, SPA and Ramsar.

The RTN30 Lincolnshire Central to Ruthamford North potable transfer (75Ml/d) (scheme included under the WRMP 2024) and River Nene (Pitsford Water) Drought Permit considered the potential LSE on Nene Wash SAC, SPA and Ramsar. LSEs from the potable transfer were identified during construction of a new pipeline resulting in potential habitat loss or damage through increased sedimentation, contamination (accidental release or resuspension of contaminants) and the risk of introducing INNS. No LSEs during operational activities were identified. No impacts upon water flow and hydrology were identified. The identified pathways will be mitigated via a CoCP, good industry practice, design optimisation (directional drilling of watercourses such as the River Nene). On the basis of the implementation of those mitigation measures, the HRA concluded that 'at the plan level there is confidence adverse effects can be avoided or fully mitigated'. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon Nene Wash SAC, SPA and Ramsar.

The RTN17 Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (scheme included under the WRMP 2024) and River Nene (Pitsford Water) Drought Permit considered the potential LSE on Nene Wash SAC, SPA and Ramsar. Impacts on the Habitats Sites have been screened out due to their upstream location and therefore considered lack of LSE.

The Upper Nene Valley Gravel Pits SPA and Ramsar have not been screened in relation to any of the options associated with AWS WRMP 2024, therefore no in-combination assessment was required.

6.2.5 River Nene (Rutland Water)

The FNF29 Fens Reservoir 50MCM (usable volume) (44.4Ml/d) (scheme included under the WRMP 2024) and River Nene (Rutland Water) considered the potential LSE on Nene Washes SAC, SPA and Ramsar site, on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. LSEs from Fens Reservoir were identified during construction and operation of a new reservoir. Construction impacts from

construction included supporting off-site habitat loss or damage, non-physical disturbance (i.e. noise, vibration, human presence and artificial light), contamination and biological disturbance with the introduction of invasive non-native species (INNS). Impacts upon Nene Washes SAC have been identified during operation of the Fens Reservoir through physical damage (changes to the hydrological regime may result in changes to the deposition rates of fine sediment on gravels), contamination (decrease in dissolved oxygen) and biological disturbance (risk of increasing mortality). Impacts upon Nene Washes SPA and Ramsar site have been identified during operation of the Fens Reservoir through potential changes to water quantity within the water table that may alter the supporting processes on which the habitats of qualifying species rely. No impacts upon The Wash SPA and Ramsar site, and upon The Wash and North Norfolk Coast SAC have been identified, it is considered that '*there is sufficient flexibility over the exact location, scale, timing and nature of the option that it can be implemented in a way that will be compliant with the legally binding environmental objectives set out in the river Basin Management Plan'*. The identified pathways will be mitigated via a code of construction practice (CoCP), good industry practice, design optimisation (location, silt screening, directional drilling of watercourses, fish screens at the intake). On the basis of the implementation of those mitigation measures, the HRA concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated'*. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon Nene Washes SAC, SPA and Ramsar site, on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site.

The RTN30 Lincolnshire Central to Ruthamford North potable transfer (75Ml/d) (scheme included under the WRMP 2024) and River Nene (Rutland Water) Drought Permit considered the potential LSE on Nene Washes SAC, SPA and Ramsar site. LSEs from the potable transfer were identified during construction of a new pipeline resulting in potential habitat loss or damage through increased sedimentation, contamination (accidental release or resuspension of contaminants) and the risk of introducing INNS. No LSEs during operational activities were identified. No impacts upon water flow and hydrology were identified. The identified pathways will be mitigated via a CoCP, good industry practice, design optimisation (directional drilling of watercourses such as the River Nene). On the basis of the implementation of those mitigation measures, the HRA concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated'*. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon Nene Washes SAC, SPA and Ramsar site.

The FND22 Marham Abstraction (7.9Ml/d up to 2039, 12.3Ml/d after 2039) (scheme included under the WRMP 2024) and River Nene (Rutland Water) Drought Permit considered the potential LSE on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. LSEs were identified during construction of a new pipeline, through physical loss/damage to habitat for otters, non-physical disturbance (i.e. noise, vibration, human presence and artificial light), contamination and biological disturbance within the River Nar. LSEs were also identified during operational activities of the new abstraction which may result in changes in flow downstream of the new abstraction location (River Nar) resulting in physical damage, non-physical disturbance for otters, contamination (i.e. changes to water quality including turbidity and sedimentation) and biological disturbance following changes in water quality (i.e. algal blooms). The identified pathways will be mitigated via a CoCP, good industry practice, design optimisation. On the basis of the implementation of those measures, the HRA concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated'*. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and Ramsar site.

The RTN17 Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (scheme included under the WRMP 2024) and River Nene (Rutland Water) Drought Permit considered the potential LSE on The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and Ramsar site have been screened out due to their upstream location and therefore considered lack of LSE. No LSEs were identified during the construction of the new reservoir, and LSEs were considered during operational activities. '*The proposed transfer of flows from the River Trent into the upper Witham system will result in increased flows in the River Witham, down to the abstraction at Langrick Bridge (upstream of the Wash)*'. It is considered that the operation of the transfer will pose a risk of introducing INNS and hydrological change within the Habitats Site that may alter the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely. The identified pathways will be mitigated by operational limits of abstraction and emergency drawdown discharge constrained by the Anglian River Basin Management Plan (RBMP). The AA conducted for the RTN17 option concluded: '*that the aspects of option design described [in the WRMP] will allow adherence to the RBMP and ensure no adverse effect on site integrity will result from water abstraction or emergency drawdown'*. On the basis of the implementation of those measures, the HRA

concluded that '*at the plan level there is confidence adverse effects can be avoided or fully mitigated*'. It is therefore considered that with mitigation measures, no adverse nor residual effects are anticipated upon The Wash and North Norfolk Coast SAC, The Wash SPA and The Wash Ramsar site. Nene Washes SAC, SPA and Ramsar site.

6.2.6 River Trent (Hall WTW)

The Anglian Water's Water Resource Management Plan (WRMP) 2024 was published in April 2025[80], with the HRA appendix published in August 2024[81].

The South Humber Bank Non-potable desalination (60Ml/d) (SHB9) and the River Trent (Hall WTW) Drought Permit considered potential for LSE on the Humber Estuary SAC, SPA and Ramsar Site. LSEs from South Humber Bank Non-potable desalination (60Ml/d) (SHB9) were identified during construction and operation consist of physical loss and/or damage, non-physical disturbance toxic/non-toxic contamination and biological disturbance. The identified impact pathways will be mitigated by following the East Inshore and Offshore Marine Plan policies as well as incorporating several design, construction and operational measure to reduce the risk of impacts. As no potential impacts were identified for River Trent (Hall WTW), no in-combination effects have been identified from the South Humber Bank Non-potable desalination (60Ml/d) (SHB9) and the River Trent (Hall WTW) Drought Permit upon the Humber Estuary SAC, SPA and Ramsar Site.

The Lincolnshire East Groundwater (7.5Ml/d) (LNE11) and the River Trent (Hall WTW) Drought Permit considered potential for LSE on the Humber Estuary SAC, SPA and Ramsar Site. LSEs from Lincolnshire East Groundwater (7.5Ml/d) (LNE11) were identified during construction and operation consist of physical loss and/or damage, non-physical disturbance toxic/non-toxic contamination and biological disturbance. The identified impact pathways will be mitigated by following the Code of Construction practices as well as following good industry practices for construction and operational to reduce the risk of impacts. As no potential impacts were identified for River Trent (Hall WTW), no in-combination effects have been identified from the Lincolnshire East Groundwater (7.5Ml/d) (LNE11) and the River Trent (Hall WTW) Drought Permit upon the Humber Estuary SAC, SPA and Ramsar Site.

The Mablethorpe desalination Seawater (50Ml/d) (LNE6) and the River Trent (Hall WTW) Drought Permit considered potential for LSE on the Humber Estuary SAC, SPA and Ramsar Site. LSEs from Mablethorpe desalination Seawater (50Ml/d) (LNE6) were identified during construction and operation consist of physical loss and/or damage, non-physical disturbance toxic/non-toxic contamination and biological disturbance. The identified impact pathways will be mitigated by following the East Inshore and Offshore Marine Plan policies as well as incorporating several design, construction and operational measure to reduce the risk of impacts. As no potential impacts were identified for River Trent (Hall WTW), no in-combination effects have been identified from the Mablethorpe desalination Seawater (50Ml/d) (LNE6) and the River Trent (Hall WTW) Drought Permit upon the Humber Estuary SAC, SPA and Ramsar Site.

The Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (RTN17) and the River Trent (Hall WTW) Drought Permit considered potential for LSE on the Humber Estuary SAC, SPA and Ramsar Site. LSEs from the Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (RTN17) were identified during operation consist of physical damage. The Appropriate Assessment concluded that the design option will adhere to the River Basin Management Plan (RBMP) and ensure no adverse effect on site integrity will result from water abstraction or emergency drawdown. As no potential impacts were identified for River Trent (Hall WTW), no in-combination effects have been identified from the Lincolnshire Lincolnshire Reservoir 50MCM (usable volume) (169Ml/d) (RTN17) and the River Trent (Hall WTW) Drought Permit upon the Humber Estuary SAC, SPA and Ramsar Site.

The Lincolnshire East to Lincolnshire Central potable transfer (29Ml/d) (LNC25) and the River Trent (Hall WTW) Drought Permit considered potential for LSE on the Humber Estuary SAC, SPA and Ramsar Site. LSEs from Lincolnshire East to Lincolnshire Central potable transfer (29Ml/d) (LNC25) were identified during construction consist of physical loss and/or damage, non-physical disturbance toxic/non-toxic contamination and biological disturbance. The identified impact pathways will be mitigated by following the Code of Construction practices as well as incorporating several design and construction measures to reduce the risk of impacts. As no potential impacts were identified for River Trent (Hall WTW), no in-combination effects have

[80] Anglian Water (2025), Main Document: Our Water Resources Management Plan 2024. V6 WRMP24 main report

[81] Mott Macdonald, (2024). Anglian Water WRMP 24 Environmental Report: Sub-Report A: Habitats Regulations Assessment (HRA). wrmp24-environment-main-report-sub-report-a-hra.pdf

been identified from the Lincolnshire East to Lincolnshire Central potable transfer (29Ml/d) (LNC25) and the River Trent (Hall WTW) Drought Permit upon the Humber Estuary SAC, SPA and Ramsar Site.

6.2.7 Wellington Wellfield (Stoke Ferry & Marham WTW)

There is no overlap in Habitats Site considered for the Wellington Wellfield drought permit and Anglian Water's WRMP.

6.3 OTHER WATER COMPANY DROUGHT PLANS

Assessment of the potential for in-combination effects of supply side and drought permit/order actions listed in neighbouring water companies' drought plans has been undertaken. It should be noted that for other companies/organisations are subject to review on timescales that may not be aligned with the timescales of AWS Drought Plan revision. The information used to carry out these assessments is considered to be the most up to date information available at time of writing, but the assessments should be reviewed at the time of drought action implementation to ensure that no changes to the neighbouring water company drought actions has been made in the intervening period, and that the assessment, therefore remains valid.

The following neighbouring watering company drought plans were considered:

- Cambridge Water (2022)[82]
- Affinity Water (2022)[83]
- Yorkshire Water (2022)[84] - There is no overlap in Habitats Sites considered for any drought permit and Yorkshire Water's drought plan 2022.
- Severn Trent Water (2022)[85] - There is no overlap in Habitats Sites considered for any drought permit and Severn Trent Water's drought plan 2022.
- Essex and Suffolk Water (2022)[86]

6.3.1 Costessey (Heigham WTW)

At the time of writing this report, information on drought permit/order actions listed for neighbouring water companies has not been updated since the completion of DP22. The assessments will be reviewed and updated when the DP27 is published to ensure that the available information is considered within this in-combination assessment.

6.3.2 Lower Colne (Ardleigh Reservoir)

At the time of writing this report, information on drought permit/order actions listed for neighbouring water companies has not been updated since the completion of DP22. The assessments will be reviewed and updated when the DP27 is published to ensure that the available information is considered within this in-combination assessment.

6.3.3 River Gt Ouse (Grafham Water)

6.3.3.1 Cambridge Water

There is no overlap in Habitats Site considered for the River Gt Ouse (Grafham Water) Drought Permit and Cambridge Water drought plan 2022.

6.3.3.2 *Affinity Water*

There is no overlap in Habitats Sites considered for the River Gt Ouse (Grafham Water) Drought Permit and Affinity Water's Drought Plan. It should be noted that the Affinity Water Central Region Supply zone, although no sources are within the Bedford Ouse catchment, additional abstraction from boreholes close to the catchment divide might have some small impact on river flow during a drought. Given that no sites considered

[82] Cambridge Water (2022), Final drought plan and Appendix F – habitats regulation assessment: Our Drought Plan | Cambridge Water

[83] Affinity Water, (2022). Drought Management Plan 2022: Habitats Regulations Assessment Report. Drought-Management-Plan-Habitats-Regulations-Assessment.pdf

[84] Yorkshire Water (2022). Habitats Regulation Assessment Screening Report: Yorkshire Water's Drought Plan 2002. yorkshire-water-drought-plan-2022-hra.pdf

[85] Severn Trent (2022), Drought plan. drought-plan-2022-2027.pdf

[86] Essex and Suffolk Water (2022) Drought Plan. ESW Final Published Drought Plan 2018.docx

within this appendix have been considered within the HRA for the Affinity Water's Drought Management Plan, it is unlikely that these additional abstractions will have an adverse effect in-combination with River Gt Ouse (Grafham Water) Drought Permit.

6.3.4 River Nene (Pitsford)

6.3.4.1 Cambridge Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Cambridge Water Drought Plan 2022.

6.3.4.2 Affinity Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Affinity Water's Drought Plan.

6.3.4.3 Yorkshire Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Yorkshire Water's Drought Plan.

6.3.4.4 Severn Trent Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Severn Trent Water's Drought Plan.

6.3.4.5 Essex and Suffolk Water

Draft conclusions of no LSE were reached with regards to drought options, however in discussion with Natural England in 2021, Essex and Suffolk water agreed to undertake a new HRA to reflect new data collected. The HRA will be presented as Appendix 12 of the Drought Plan. However, no data could be found at the time of writing this report. Based on the location of the boreholes referred to in the Drought Plan, no in-combination LSEs are anticipated between River Nene (Pitsford Water) Drought Permit and the Essex and Suffolk Water Drought Plan.

6.3.5 River Nene (Rutland Water)

6.3.5.1 Cambridge Water

There is no overlap in Habitats Site considered for the River Nene (Rutland Water) Drought Permit and Cambridge Water drought plan 2022.

6.3.5.2 Affinity Water

There is no overlap in Habitats Site considered for the River Nene (Rutland Water) Drought Permit and Affinity Water's drought plan.

6.3.5.3 Essex and Suffolk Water

Draft conclusions of no LSE were reached with regards to drought actions, however in discussion with Natural England in 2021, Essex and Suffolk water agreed to undertake a new HRA to reflect new data collected. The HRA will be presented as Appendix 12 of the drought plan. However, no data could be found at the time of writing this report. Based on the location of the boreholes referred to in the Essex and Suffolk Water drought plan, no in-combination LSEs are anticipated between River Nene (Rutland Water) Drought Permit and the Essex and Suffolk Water drought plan.

6.3.6 River Trent (Hall WTW)

6.3.6.1 Cambridge Water

There is no overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Cambridge Water Drought Plan 2022.

6.3.6.2 Affinity Water

There is no overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Affinity Water Drought Plan 2022.

6.3.6.3 Yorkshire Water

There is overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Yorkshire Water's Drought Plan 2022. The Humber Estuary SAC, SPA and Ramsar site have all been included in the Yorkshire Water Drought Plan 2022 as having potential for LSE in-combination with other plans or projects. Following the Stage 2 Appropriate Assessment and in-combination assessment, the Yorkshire Water Drought Plan 2022 determined that there would be no adverse effects on the Humber Estuary Habitats Sites resulting from the Yorkshire Water's Drought Plan 2022 in-combination with any other plans or projects. Therefore, it can be concluded that there will be no AEoI resulting from the River Trent (Hall WTW) Drought Permit in-combination with and Yorkshire Water's Drought Plan 2022.

6.3.6.4 Severn Trent Water

There is overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Severn Trent Water's Drought Plan 2022. The Humber Estuary SAC, SPA and Ramsar site have all been included in the Severn Trent Water WRMP 24 as having potential for LSE alone and in-combination with other water company WRMP's. Following the Stage 2 Appropriate Assessment, it was concluded that there would be no in-combination adverse effects anticipated on the Humber Estuary SAC, SPA and Ramsar Site. Therefore, it can be concluded that there will be no AEoI resulting from the River Trent (Hall WTW) Drought Permit in-combination with and Severn Trent Water's Drought Plan 2022.

6.3.6.5 Essex and Suffolk

Draft conclusions of no LSE were reached with regards to drought actions, however in discussion with Natural England in 2021, Essex and Suffolk water agreed to undertake a new HRA to reflect new data collected. The HRA will be presented as Appendix 12 of the Drought Plan. However, no data could be found at the time of writing this report. Based on the location of the abstraction point referred to in the Drought Plan, there is potential for in-combination LSEs for the Humber Estuary SAC, SPA and Ramsar site between River Trent (Hall WTW) Drought Permit and the Essex and Suffolk Water Drought Plan. Given the draft conclusion of no LSE for any Habitats Site for the Essex and Suffolk Drought Plan and no overlap in Habitats sites, it can be concluded that there will be no AEoI on Humber Estuary SAC, SPA and Ramsar site as a result of the River Trent (Hall WTW) Drought Permit in-combination with the Essex and Suffolk Water Drought Plan 2022.

6.3.7 Wellington Wellfield (Stoke Ferry & Marham WTW)

6.3.7.1 Cambridge Water

The Brettenham and the Euston options (i.e. both increase abstraction within the licence above recent actual volumes) both identified no LSE upon Breckland SPA. Both options concluded that no construction nor operational impacts were identified as no significant hydraulic continuity between the boreholes and the SPA have been identified. No LSE nor residual effects have been identified therefore, no in-combination impacts are anticipated upon the SPA.

Norfolk Valley Fens SAC did not trigger any assessment in relation to the various options assessed within the Cambridge Water's drought plan.

6.3.7.2 Affinity Water

There is no overlap in Habitats Site considered for the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and Affinity Water's drought plan.

6.3.7.3 Essex and Suffolk Water

Draft conclusions of no LSE were reached with regards to drought actions, however in discussion with Natural England in 2021, Essex and Suffolk water agreed to undertake a new HRA to reflect new data collected. The HRA will be presented as Appendix 12 of the drought plan. However, no data could be found at the time of writing this report. Based on the location of the boreholes referred to in the drought plan, no in-combination LSEs are anticipated between Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and the Essex and Suffolk Water drought plan.

6.4 OTHER WATER COMPANY WRMPS

Assessment of the potential for in-combination effects with AWS DP27 and neighbouring water companies' WRMPs has been undertaken. It should be noted that all WRMPs are subject to review every five years. The information used to carry out these assessments is considered to be the most up to date information publicly

available at time of writing. Where possible, this is also informed through on-going discussions that AWS is holding with neighbouring water companies in order to identify any water resource options which may have the potential to cause in-combination impacts with their drought options. A review of the neighbouring companies WRMP24's has been carried out, as this Drought Plan will cover 2027 - 2032 (unless plan is revised according to DPG25, Section 2.9), this assessment remains valid until 2029, after this point, if the permit was required, other companies WRMPs would be reviewed to ensure that no significant changes have occurred.

The following neighbouring watering company WRMPs were considered:

- Cambridge Water (2024)[87] - There is no overlap in Habitats Sites considered for any drought permit and Cambridge Water's WRMP 2024
- Affinity Water (2024)[88]
- Yorkshire Water (2024)[89] - There is no overlap in Habitats Sites considered for any drought permit and Yorkshire Water's WRMP 2024.
- Severn Trent Water (2024)[90] - There is no overlap in Habitats Sites considered for any drought permit and Severn Trent Water's WRMP 2024.
- Essex and Suffolk Water (2024)[91]

6.4.1 Costessey (Heigham WTW)

6.4.1.1 Affinity Water

There is no overlap in Habitats Site considered for the Costessey (Heigham WTW) Drought Permit and Affinity Water's WRMP.

6.4.1.2 Essex and Suffolk Water

There is no overlap in Habitats Site considered for the Costessey (Heigham WTW) Drought Permit and Essex and Suffolk Water's WRMP.

6.4.2 Lower Colne (Ardleigh Reservoir)

6.4.2.1 Affinity Water

There is no overlap in Habitats Site considered for the Lower Colne (Ardleigh Reservoir) Drought Permit and Affinity Water's WRMP.

6.4.2.2 Essex and Suffolk Water

There is overlap in Habitats Site considered for the Lower Colne (Ardleigh Reservoir) Drought Permit and Essex and Suffolk Water's WRMP. Abberton Reservior SPA and Ramsar site, Colne Estuaries (Mid-Essex Coast Phase 2) SPA and Ramsar site and Essex Estuaries SAC have all been included in the Essex and Suffolk Water WRMP as having potential for LSE. Following the Stage 2 AA, it was concluded that assuming all proposed monitoring and mitigation measures are implemented, there will not be a significant change to the extent and distribution of qualifying species, to the structure and function of habitats and qualifying species, and to the supporting processes on which habitats of qualifying species rely; avoiding and/or mitigating any potential effect. Therefore, it can be concluded that there will be no AEoI on Abberton Reservior SPA and Ramsar site, Colne Estuaries (Mid-Essex Coast Phase 2) SPA and Ramsar site and Essex Estuaries SAC as a result of the Lower Colne (Ardleigh Reservoir) Drought Permit in-combination with the Essex and Suffolk Water WRMP.

6.4.3 River Gt Ouse (Grafham Water)

6.4.3.1 Affinity Water

There is no overlap in Habitats Sites considered for the River Gt Ouse (Grafham Water) Drought Permit and Affinity Water's WRMP 2024. It should be noted that the Affinity Water Central Region Supply zone, although

[87] Cambridge Water - Habitat Regulation Assessment, Draft Water Resources Management Plan 2024
[88] Affinity Water - Water Resources Management Plan 2024 (WRMP24)
[89] Yorkshire Water (2024) Water Resources Management Plan yorkshire-water-final-wrmp24-technical-document-public.pdf
[90] Severn Trent - Habitat Regulation Assessment, Final Water Resources Management Plan 2024
[91] Essex & Suffolk Water – WRMP 2024 Environmental Report: Appendix F – Habitats Regulations Assessment. WRMP (2025-2030)

no sources are within the Bedford Ouse catchment, additional abstraction from boreholes close to the catchment divide might have some small impact on river flow during a drought. Given that no sites considered within this appendix have been considered within the HRA for the Affinity Water WRMP 2024. It is unlikely that these additional abstractions will have an adverse effect in-combination with River Gt Ouse (Grafham Water) Drought Permit[92].

6.4.3.2 Essex and Suffolk Water

There is no overlap in Habitats Site considered for the River Gt Ouse (Grafham Water) Drought Permit and Essex and Suffolk Water's WRMP 2024.

6.4.3.3 Essex and Suffolk Water

Draft conclusions of no LSE were reached with regards to drought actions, however in discussion with Natural England in 2021, Essex and Suffolk water agreed to undertake a new HRA to reflect new data collected. The HRA will be presented as Appendix 12 of the drought plan. No published data could be found at the time of drafting this report. Based on the location of the boreholes referred to in the drought plan, no in-combination LSEs are anticipated between River Gt Ouse (Grafham Water) Drought Permit and the Essex and Suffolk Water drought plan.

6.4.4 River Nene (Pitsford)

6.4.4.1 Affinity Water

A review of the Affinity Water's WRMP 2024[93] identified that the HRA for the Grand Union Canal (GUC) Strategic Resource Option (SRO) identified LSEs upon Upper Nene Valley Gravel Pits SPA and Ramsar. The GUC SRO is being developed in partnership between Severn Trent Water, Affinity Water and the Canal and River Trust. This option involves a transfer rising from Minworth Wastewater Treatment Works (WwTW) to the Coventry Canal at the top of Atherstone lock flight. The AA concluded that '*functionally linked land for golden plover, a qualifying species at the Upper Nene Valley Gravel Pits SPA, is unlikely to be affected, largely as a function of the distance from the site and the temporary loss of minimal areas of habitat. Due to the lack of pathways between the GUC Scheme components, no adverse effects resulting from the implementation of the scheme are reasonably foreseeable on the features of interest of Upper Nene Valley Gravel Pits SPA and Ramsar*'. The assessment excluded adverse effects on the site's integrity either alone or in-combination. Therefore, River Nene (Pitsford Water) is not anticipated to result in LSE in combination with Affinity Water's WRMP 2024.

6.4.4.2 Yorkshire Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Yorkshire Water's WRMP 2024.

6.4.4.3 Severn Trent Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Severn Trent Water's WRMP 2024[94].

6.4.4.4 Cambridge Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Cambridge Water's WRMP 2024[95].

6.4.4.5 Essex and Suffolk Water

There is no overlap in Habitats Sites considered for the River Nene (Pitsford Water) Drought Permit and Essex and Suffolk Water's WRMP 2024[96].

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[92] Affinity Water, (2024). Appendix 7.2.3 SEA Environmental Report – D (HRA). c42ce0e464c9a4415ae37b544a7dab09_Apprendix_7.2.3_SEA_Environmental_Report_D_(HRA).pdf

[93] Affinity Water, (2024). Appendix 7.2.3 SEA Environmental Report – D (HRA). Accessed at https://affinitywater.uk.engagementhq.com/wrmp

[94] Severn Trent, (2025). Habitats Regulations Assessment: Final WRMP 2024. https://www.severntrent.com/content/dam/wrmp24-documents-and-data-tables-st/final-WRMP24-HRA-Report.pdf

[95] Cambridge Water (2023). Habitats Regulations Assessment: Draft WRMP 2024. https://www.cambridge-water.co.uk/media/twqh2ovj/cambridge-water-draft-wrmp24-hra-issue-3.pdf

[96] Essex & Suffolk Water – WRMP 2024 Environmental Report: Appendix F – Habitats Regulations Assessment. WRMP (2025-2030)

6.4.5 River Nene (Rutland Water)

6.4.5.1 Affinity Water

There is no overlap in Habitats Site considered for the River Nene (Rutland Water) Drought Permit and Affinity Water's WRMP 2024.

6.4.5.2 Essex and Suffolk Water

There is no overlap in Habitats Site considered for the River Nene (Rutland Water) Drought Permit and Essex and Suffolk Water's WRMP 2024.

6.4.6 River Trent (Hall WTW)

6.4.6.1 Cambridge Water

There is no overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Cambridge Water's WRMP24.

6.4.6.2 Affinity Water

Affinity Water's WRMP24 does mention abstraction from the River Trent, however there is no overlap of Habitats Sites for the River Trent (Hall WTW) Drought Permit and Affinity Water's WRMP24.

6.4.6.3 Yorkshire Water

There is overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Yorkshire Water's WRMP24. The Humber Estuary SAC, SPA and Ramsar site have all been included in the Yorkshire Water WRMP 24 as having potential for LSE. Following the Stage 2 Appropriate Assessment, it was concluded that there would be no in-combination adverse effects anticipated on the Humber Estuary SAC, SPA and Ramsar site. Therefore, it can be concluded that there will be no AEoI resulting from the River Trent (Hall WTW) Drought Permit in-combination with and Yorkshire Water's WRMP24.

6.4.6.4 Severn Trent Water

There is overlap in Habitats Sites considered for the River Trent (Hall WTW) Drought Permit and Severn Trent Water's WRMP24. The Humber Estuary SAC, SPA and Ramsar site have all been included in the Severn Trent Water WRMP 24 as having potential for LSE alone and in-combination with other water company WRMP's. Following the Stage 2 Appropriate Assessment, it was concluded that there would be no in-combination adverse effects anticipated on the Humber Estuary SAC, SPA and Ramsar Site. Therefore, it can be concluded that there will be no AEoI resulting from the River Trent (Hall WTW) Drought Permit in-combination with and Severn Trent Water's WRMP24.

6.4.6.5 Essex and Suffolk Water

Essex and Suffolk Water's WRMP24 does mention abstraction from the River Trent, however there is no overlap of Habitats Sites for the River Trent (Hall WTW) Drought Permit and Essex and Suffolk Water's WRMP24.

6.4.7 Wellington Wellfield (Stoke Ferry & Marham WTW)

6.4.7.1 Affinity Water

There is no overlap in Habitats Site considered for the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and Affinity Water's WRMP.

6.4.7.2 Essex and Suffolk Water

There is no overlap in Habitats Site considered for the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and Essex and Suffolk Water's WRMP.

6.5 OTHER PLANS AND PROJECTS

6.5.1 Costessey (Heigham WTW)

6.5.1.1 Water Resource East (WRE)

A review of the Regional Water Resources Plan for Eastern England[97] provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE. The next iteration of the Regional Water Resources Plan for Eastern England is due to be published in 2028[98]. This new plan will be reviewed and included in the AWS DP32.

6.5.1.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Site, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Site, alone or in-combination with other plans and projects. Therefore, no in-combination LSEs with Costessey (Heigham WTW) Drought Permit are anticipated. The RBMP will be updated in December 2027[99]. The updated plan will be reviewed and included in the AWS DP32.

6.5.1.3 National Policy Statement – Sizewell C

There is no overlap in Habitats Site considered for the Costessey (Heigham WTW) Drought Permit and Sizewell C construction or operation.

6.5.1.4 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the Costessey (Heigham WTW) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.1.5 East West Rail

There is no HRA for East West Rail as there are no Habitats Site that could be affected by the scheme and therefore, no in-combination effects with Costessey (Heigham WTW) Drought Permit are anticipated.

6.5.1.6 A47 North Tuddenham to Easton improvements

There is no overlap in Habitats Site considered for the Costessey (Heigham WTW) Drought Permit and A47 North Tuddenham to Easton improvements construction or operation[100].

6.5.2 Lower Colne (Ardleigh Reservoir)

6.5.2.1 Water Resource East (WRE)

A review of the Regional Water Resources Plan for Eastern England[89] provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE. The next iteration of the Regional Water Resources Plan for Eastern England is due to be published in 2028. This new plan will be reviewed and included in the AWS DP32.

6.5.2.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Site, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Site, alone or in-combination with other plans and projects. Therefore, no in-combination LSEs with Lower Colne (Ardleigh Reservoir) Drought Permit are anticipated. The RBMP will be updated in December 2027. The updated plan will be reviewed and included in the AWS DP32.

6.5.2.3 National Policy Statement – Sizewell C

There is no overlap in Habitats Site considered for Lower Colne (Ardleigh Reservoir) Drought Permit and Sizewell C construction or operation.

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[97] Mott Macdonald, (2023). Regional Water Resources Plan for Eastern England – Integrated Environmental Assessment. Sub-Report A: Habitats Regulations Assessment. WRE-Habitats-Regulations-Assessment_IEA-Sub-Report-A_20231212.pdf.pagespeed.ce.e_sjUU59ub.pdf

[98] WRE-Regional-Water-Resources-Plan-for-Eastern-England.pdf

[99] River basin management plans, updated 2022: introduction - GOV.UK

[100] A47 North Tuddenham to Easton improvements - REPORT TO INFORM HABITATS REGULATIONS ASSESSMENT

6.5.2.4 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the Lower Colne (Ardleigh Reservoir) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.2.5 East West Rail

There is no HRA for East West Rail as there are no Habitats Site that could be affected by the scheme and therefore, no in-combination effects with Lower Colne (Ardleigh Reservoir) Drought Permit are anticipated.

6.5.3 River Gt Ouse (Grafham Water)

6.5.3.1 Water Resource East (WRE)

A review of the Regional Water Resources Plan for Eastern England[89] provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE. The next iteration of the Regional Water Resources Plan for Eastern England is due to be published in 2028. This new plan will be reviewed and included in the AWS DP32.

6.5.3.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Site, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Site, alone or in-combination with other plans and projects. Therefore, no in-combination LSEs with River Gt Ouse (Grafham Water) Drought Permit are anticipated. The RBMP will be updated in December 2027. The updated plan will be reviewed and included in the AWS DP32.

6.5.3.3 National Policy Statement – Sizewell C

There is no overlap in Habitats Site considered for River Gt Ouse (Grafham Water) Drought Permit and Sizewell C construction or operation.

6.5.3.4 A428 upgrade

There is no overlap in Habitats Site considered for River Gt Ouse (Grafham Water) Drought Permit and the A428 Black Cat to Caxton Gibbet upgrade[101]. The Improvements are set to be finished by spring 2027[102].

6.5.3.5 Cambridge and Peterborough Combined Authority Local Transport Plan (LTP)

A review of the Cambridge and Peterborough Combined Authority LTP[103] assessed potential LSE upon Ouse Washes SAC, SPA and Ramsar site from various projects. Potential pathways included air pollution, disturbance (human presence, noise, vibration, lighting) and water pollution. The HRA concluded that no LSEs were anticipated upon these Habitats Site. No impacts upon water flow and hydrology were identified, however the implementation of the drought permit may result in cumulative effects upon water quality in particular the presence of phosphate within the River Great Ouse. The HRA concluded that '*the source of phosphates is discharges from sewage treatment works and agricultural run off with a very minor component attributable to road runoff and so it is considered unlikely that there will be any significant effect on any Habitat site from water pollution attributable to the policies within the LTP. Any projects brought forward through the LTP which have the potential to cause water pollution would be subject to project specific HRA.'* Ouse Washes SAC, SPA and Ramsar site is located within Reach 2 where hydrological assessment has identified a major risk of impact through water quality, in particular orthophosphate in the summer months during Stage 2. Further details regarding specific projects brought forward under the LTP should be assessed to understand the risk of impacts to water quality (orthophosphate) and therefore cumulative impacts upon Ouse Washes SAC, SPA and Ramsar site.

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[101] Highways England (2021) A428 Black Cat to Caxton Gibbet improvements: Habitats Regulations Assessment Accessed at https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/TR010044/documents

[102] https://nationalhighways.co.uk/our-roads/a428-black-cat-to-caxton-gibbet/latest-updates/

[103] Cambridge and Peterborough Combined Authority (2022). Local Transport and Connectivity Plan: Habitats Regulation Assessment Task 1. Accessed at https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/documents/transport/local-transport-plan/Reports-and-Appendices/Evidence-CPCA-LTCP-Habitats-Regulations-Assessment.pdf

6.5.3.6 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the River Gt Ouse (Grafham Water) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.3.7 East West Rail

There is no HRA for East West Rail as there are no Habitats Site that could be affected by the scheme and therefore, no in-combination effects with River Gt Ouse (Grafham Water) Drought Permit are anticipated.

6.5.3.8 Greater Cambridge Local Plan (GCLP)

The AA phase of the HRA for GCLP found no AEoI on integrity in relation to water quantity/quality at Ouse Washes SAC, SPA and Ramsar site provided that a statement of common ground with AWS is reached prior to submission of the GCLP to confirm the necessary WWTW upgrades will be achieved, the provided site-supply options identified in the WRMP are brought forward and the following safeguards and mitigation measures already required by GCLP are successfully implemented[104]:

- There is a commitment in the plan, which ensures that all development proposals must demonstrate that there is an adequate water supply available to serve the development.
- There is a commitment in the plan to deliver water efficient design, including water usage of no more than 80 litres/person/day for residential developments of 100 or more and 90 to 100 litres/person/day for residential developments of less than 100 dwellings.
- There is a commitment in the plan to protect designated sites, including Habitats Site, as identified in this HRA, from AEoI as a result of development proposals coming forward through the plan period.
- There is a commitment in the plan that ensures any development is supported by sufficient wastewater treatment infrastructure to protect and enhance water quality.
- There is a commitment in the plan that ensures water quality improvements through the incorporation of SuDS into all new developments.

6.5.3.9 Cambridge Children's Hospital and Cambridge Cancer Research Hospital

No further details are available on this scheme at present to undertake an in-combination assessment with the River Gt Ouse (Grafham Water) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.3.10 Melbourn Science Park – Redevelopment

No further details are available on this scheme at present to undertake an in-combination assessment with the River Gt Ouse (Grafham Water) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.3.11 Cambridge North Station Commercial Quarter Offices

No further details are available on this scheme at present to undertake an in-combination assessment with the River Gt Ouse (Grafham Water) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.4 River Nene (Pitsford Water)

6.5.5 River Nene (Rutland Water)

6.5.5.1 Water Resource East (WRE)

A review of the Regional Water Resources Plan for Eastern England[89] provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE. The next iteration of the Regional Water Resources Plan for Eastern England is due to be published in 2028. This new plan will be reviewed and included in the AWS DP32.

[104] Greater Cambridge Local Plan

6.5.5.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Site, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Site, alone or in-combination with other plans and projects. Therefore, no in-combination LSEs with River Nene (Rutland Water) Drought Permit are anticipated. The RBMP will be updated in December 2027. The updated plan will be reviewed and included in the AWS DP32.

6.5.5.3 National Policy Statement – Sizewell C

There is no overlap in Habitats Site considered for River Nene (Rutland Water) Drought Permit and Sizewell C construction or operation.

6.5.5.4 A428 upgrade

A428 Black Cat to Caxton Gibbet improvements There is no overlap in Habitats Site considered for River Nene (Rutland Water) Drought Permit and the A428 upgrade. The Improvements are set to be finished by spring 2027.

6.5.5.5 Cambridge and Peterborough Combined Authority Local Transport Plan (LTP)

A review of the Cambridge and Peterborough Combined Authority LTP assessed potential LSE upon Nene Washes SAC, SPA and Ramsar site from various projects. Potential pathways included air pollution, disturbance (human presence, noise, vibration, lighting) and water pollution. The HRA concluded that no LSEs were anticipated upon these Habitats Site. No impacts upon water flow and hydrology were identified, however the implementation of the drought permit may result in cumulative effects upon water quality in particular the presence of phosphate within the River Great Ouse. The HRA concluded that '*the source of phosphates is discharges from sewage treatment works and agricultural run off with a very minor component attributable to road runoff and so it is considered unlikely that there will be any significant effect on any Habitat site from water pollution attributable to the policies within the LTP. Any projects brought forward through the LTP which have the potential to cause water pollution would be subject to project specific HRA'*. Nene Washes SAC, SPA and Ramsar site is located within Reach 2 where hydrological assessment has identified a major risk of impact through water quality, in particular orthophosphate. Further details regarding specific projects brought forward under the LTP should be assessed to understand the risk of impacts to water quality (orthophosphate) and therefore cumulative impacts upon Nene Washes SAC, SPA and Ramsar site.

6.5.5.6 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the River Nene (Rutland Water) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.5.7 East West Rail

There is no HRA for East West Rail as there are no Habitats Site that could be affected by the scheme and therefore, no in-combination effects with River Nene (Rutland Water) Drought Permit are anticipated.

6.5.5.8 Medworth Energy from Waste Combined Heat and Power Facility

There is no overlap in Habitats Site considered for River Nene (Rutland Water) Drought Permit and Medworth Energy from Waste Combined Heat and Power Facility for construction or operation[105].

6.5.6 River Trent (Hall WTW)

6.5.6.1 Water Resource East (WRE)

A review the Regional Water Resources Plan for Eastern England provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE.

6.5.6.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Sites, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Sites, alone or in-

[105] Medworth Energy from Waste Combined Heat and Power Facility - Habitat Regulation Assessment Non-Significant Effects Report (NSER)

combination with other plans and projects. Therefore, no in-combination LSEs with River Trent (Hall WTW) Drought Permit are anticipated.

6.5.6.3 National Policy Statement – Sizewell C

The HRA for Sizewell C identified potential for LSE on the Humber Estuary SAC and Ramsar site as the sites are outside of the identified hydrological ZoI but are functionally linked. The Stage 2 Appropriate Assessment concluded that there would be no AEoI alone or in-combination with other plans or project. Therefore, no in-combination LSEs with River Trent (Hall WTW) Drought Permit are anticipated.

6.5.6.4 Cambridge and Peterborough Combined Authority Local Transport Plan (LTP)

There is no overlap between the Cambridge and Peterborough Combined Authority LTP and the River Trent (Hall WTW) Drought Permit. Therefore, no in-combination LSEs with River Trent (Hall WTW) Drought Permit are anticipated.

6.5.6.5 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the River Trent (Hall WTW) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.6.6 East West Rail

There is no HRA for East West Rail as there are no Habitats Sites that could be affected by the scheme and therefore, no in-combination effects with River Trent (Hall WTW) Drought Permit are anticipated.

6.5.7 Wellington Wellfield (Stoke Ferry & Marham WTW)

6.5.7.1 Water Resource East (WRE)

A review of the Regional Water Resources Plan for Eastern England[89] provided the same information as Anglian Water WRMP and therefore no further assessment was conducted with regards to WRE. The next iteration of the Regional Water Resources Plan for Eastern England is due to be published in 2028. This new plan will be reviewed and included in the AWS DP32.

6.5.7.2 Anglian River Basin Management Plan (RBMP)

The level of detail in the plan does not allow consideration of the effect on individual Habitats Site, but the HRA determines that the RBMP is not likely to have any significant effects on any Habitats Site, alone or in-combination with other plans and projects. Therefore, no in-combination LSEs with Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit are anticipated. The RBMP will be updated in December 2027. The updated plan will be reviewed and included in the AWS DP32.

6.5.7.3 National Policy Statement – Sizewell C

There is no overlap in Habitats Site considered for Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and Sizewell C construction or operation.

6.5.7.4 A428 upgrade

A428 Black Cat to Caxton Gibbet improvements There is no overlap in Habitats Site considered for Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit and the A428 upgrade. The Improvements are set to be finished by spring 2027.

6.5.7.5 Cambridge and Peterborough Combined Authority Local Transport Plan (LTP)

A review of the Cambridge and Peterborough Combined Authority LTP assessed potential LSE upon Breckland SPA from various projects. Potential pathways included habitat loss, habitat fragmentation, air pollution and disturbance (human presence, noise, vibration, lighting). The HRA concluded that no LSEs were anticipated upon the Habitats Site. No impacts upon water quality nor water flow and hydrology were identified. Therefore, no cumulative effects are anticipated with Wellington Wellfield.

6.5.7.6 Cambridge-Milton Keynes-Oxford corridor

No further details are available on this scheme at present to undertake an in-combination assessment with the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit. This would be reviewed further in the event of a potential drought permit application.

6.5.7.7 East West Rail

There is no HRA for East West Rail as there are no Habitats Site that could be affected by the scheme and therefore, no in-combination effects with Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit are anticipated.

7. HRA CONCLUSIONS

Anglian Water has a statutory duty to assess its project with regards to its impacts upon Habitats Site and is therefore the Competent Authority for this HRA.

The assessment comprises:

- A 'screening' of Habitats Site within the study area to identify those sites and features where there will self-evidently be 'no effect', 'no AWS' and those where significant effects are likely or uncertain; and
- An 'AA' of any Habitats Site where significant effects cannot be excluded.

The conservation objectives are taken into account at the screening and AA stages as necessary.

7.1 STAGE 1 SCREENING

The HRA Stage 1 Screening identified 16 Habitats Sites which may have LSE by the drought permits alone and 17 Habitats sites which may result in LSE in-combination with other plans and projects. These outcomes are listed below (note, this includes actions that may rely on mitigation measures to prevent significant effects occurring); these were therefore taken forward to an AA stage.

No LSE or residual effects were identified at the Stage 1 Screening for the following Habitats sites:

- Barnack Hills & Holes SAC
- Breckland SPA
- Eversden and Wimpole Woods SAC,
- Orton Pit SAC,
- The Wash and North Norfolk Coast SAC (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water)),
- The Wash SPA (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water))
- The Wash Ramsar site, (all features screened out for River Nene (Pitsford Water) and River Gt Ouse (Grafham Water))

No LSE was identified for the following sites, however residual effects requiring in-combination assessment were identified:

- Breydon Water SPA, (all features screened in)
- Breydon Water Ramsar site, (all features screened in)
- Broadland SPA, (all features screened in)
- Broadland Ramsar site, (all features screened in)
- Humber Estuary SAC, (all features screened in)
- Humber Estuary SPA, (all features screened in)
- Humber Estuary Ramsar Site, (all features screened in)
- Nene Washes SAC, (all features screened in for River Nene (Pitsford Water))
- Nene Washes SPA, (all features screened in for River Nene (Pitsford Water))
- Nene Washes Ramsar site, (all features screened in for River Nene (Pitsford Water))
- Portholme SAC, (all features screened in)

- The Wash and North Norfolk Coast SAC, (all features screened in for River Nene (Rutland Water))
- The Wash SPA, (all features screened in for River Nene (Rutland Water))
- The Wash Ramsar site, (all features screened in for River Nene (Rutland Water))
- Upper Nene Valley Gravel Pits SPA, (all features screened in)
- Upper Nene Valley Gravel Pits Ramsar site, (all features screened in)
- The Broads SAC, (all features screened in)

LSE alone requiring appropriate assessment and an in-combination assessment at Stage 2:

- Abberton Reservoir SPA, (all features screened in)
- Abberton Reservoir Ramsar site, (all features screened in)
- Breckland SAC, (all features screened in except for semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*).
- Colne Estuary (Mid-Essex Coast Phase 2) SPA, (all features screened in)
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site, (all features screened in)
- Essex Estuaries SAC, (all features screened in)
- Nene Washes SAC, (all features screened in for River Nene (Rutland Water))
- Nene Washes SPA, (all features screened in for River Nene (Rutland Water))
- Nene Washes Ramsar site, (all features screened in for River Nene (Rutland Water))
- Norfolk Valley Fens SAC, (all features screened in except for; Northern Atlantic wet heaths with *Erica tetralix*, European dry heaths, semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*), Narrow-mouthed whorl snail, Desmoulins whorl snail.
- Ouse Washes SAC, (all features screened in)
- Ouse Washes SPA (UK9008041), (all features screened in)
- Ouse Washes Ramsar site (UK11051), (all features screened in)
- River Wensum SAC (UK0012647), (all features screened in)
- Rutland Water SPA (UK9008051), (all features screened in)
- Rutland Water Ramsar site (UK11062), (all features screened in)

7.2 STAGE 2 APPROPRIATE ASSESSMENTS

Stage 2 AAs were undertaken for those Habitats Site that may be significantly affected by the proposed scheme (or where there was uncertainty at the screening stage), alone or in-combination.

The results of the assessments conclude that six Habitats Sites will have no AEoI as a result of the implementation of the drought permits alone or in-combination with other plans or projects. It was concluded that 10 Habitats Sites would have in AEoI as a result of implementing the drought permits alone or in-combination with other plans or projects, however with mitigation measures in place all AEoI would be mitigated. Therefore, no further assessment is required.

The Appropriate Assessment concluded that the following Habitats Sites would result in no AEoI alone and would not require mitigation:

- Abberton Reservoir SPA

- Abberton Reservoir Ramsar Site
- Colne Estuary (Mid-Essex Coast Phase 2) SPA
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site
- Essex Estuary SAC
- Norfolk Valley Fens SAC

The Appropriate Assessment concluded that the following Habitats Sites would require monitoring and mitigation to conclude no AEoI alone:

- Breckland SAC
- Nene Washes SAC
- Nene Washes SPA
- Nene Washes Ramsar site
- Ouse Washes SAC
- Ouse Washes SPA
- Ouse Washes Ramsar site
- River Wensum SAC
- Rutland Water SPA
- Rutland Water Ramsar site

An in-combination assessment was required for the following Habitats Sites where residual effects were identified:

- Abberton Reservoir SPA
- Abberton Reservoir Ramsar Site
- Breckland SAC
- Colne Estuary (Mid-Essex Coast Phase 2) SPA
- Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site
- Essex Estuary SAC
- Norfolk Valley Fens SAC
- Nene Washes SAC
- Nene Washes SPA
- Nene Washes Ramsar site
- Ouse Washes SAC
- Ouse Washes SPA
- Ouse Washes Ramsar site
- River Wensum SAC
- Rutland Water SPA
- Rutland Water Ramsar site

The in-combination assessment concluded that there would be no AEoI resulting from any of the Drought Actions in-combination with other plans or projects on any of the above Habitats Sites aside from the River Nene (Pitsford Water) Nene Washes SAC, SPA and Ramsar site where further information about the Cambridge and Peterborough Combined Authority Local Transport Plan is required to ascertain no in-combination effect.

APPENDICES

ANNEX-1: SCREENING ASSESSMENT TABLES

Screening assessment of the Special Area of Conservation

Table AN- 1: Stage 1 Screening of Barnack Hills & Holes SAC

Habitats Site name:	**Barnack Hills & Holes SAC (UK0030031)**	
Designation type and location	SAC, TF07650458	**Water Dependent?** All features have been identified as not water dependant.
Qualifying features	**H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco Brometalia* (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites)** - This site hosts the priority habitat type "orchid rich sites". his habitat at Barnack Hills and Holes consists largely of CG5 *Bromus erectus – Brachypodium pinnatum* grassland. It supports what is considered to be the largest UK population of the nationally scarce man orchid *Aceras anthropophorum*. It also supports a rich assemblage of other orchid species, such as fragrant orchid *Gymnadenia conopsea,* pyramidal orchid *Anacamptis pyramidalis* and bee orchid *Ophrys apifera*. The site represents orchid-rich grassland in the northern part of its range, on limestone rather than on chalk.	
Current conservation status (Article 17, JNCC, 2019[106])	**H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco Brometalia* (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites)** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** stable **Main pressure and threats:** Conversion from one type of agricultural land use to another (excluding drainage and burning), Abandonment of grassland management (e.g. cessation of grazing or mowing), Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Application of synthetic (mineral) fertilisers on agricultural land, Use of plant protection chemicals in agriculture, Mixed source air pollution, air-borne pollutant), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices), Droughts and decreases in precipitation due to climate change, Increases or changes in precipitation due to climate change, Threat Ranking Conversion from one type of agricultural land use to another (excluding drainage and burning), Abandonment of grassland management (e.g. cessation of grazing or mowing), Intensive grazing or overgrazing by livestock, Extensive grazing or undergrazing by livestock, Application of synthetic (mineral) fertilisers on agricultural land, Use of plant protection chemicals in agriculture, Mixed source air pollution, air-borne pollutants, Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices), Droughts and decreases in precipitation due to climate change, Increases or changes in precipitation due to climate change.	

[106] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	Barnack Hills & Holes SAC (UK0030031)	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: The extent and distribution of qualifying natural habitats; The structure and function (including typical species) of qualifying natural habitats; and The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[107].	Barnack Hills & Holes SSSI: 100.00% favourable	
Site Improvement Plan (SIP)	1 Changes in species distributions – Threat: H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) – Investigate and monitor status of Man Orchid populations 2 Public Access/Disturbance – Pressure: H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Research and mitigation of visitor impacts 3 Air Pollution: impact of atmospheric nitrogen deposition - Threat: H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Investigate potential atmospheric nitrogen impacts on the site.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Rutland)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling o f Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr) would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF f rom 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. Barnack Hills & Holes SAC is within an approximate 6km radius of the abstraction point. It is not hydrologically connected to the River Nene. Potential impact pathways include reduced flow rates in the River Nene, reduced groundwater refilling rates, water quality de terioration and increased siltation. This could have an impact on all water dependant qualifying habitats in the SAC. **Habitat Features: H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco Brometalia* (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites)** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The semi-natural dry grasslands are found on thin, well-drained, lime-rich soils associated with chalk and limestone. Semi-natural dry grasslands and scrubland facies on calcareous substrates are not considered water dependant and therefore no LSE are anticipated during operation of the Drought Action.	**No**

[107] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Table AN- 2: Stage 1 Screening of Breckland SAC

Habitats Site name:	**Breckland SAC (UK0019865)**	
Designation type and location	SAC, TL862948	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**H2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands; Open grassland with grey-hair grass and common bent grass of inland dunes -** Wangford Warren and adjoining parts of RAF Lakenheath are included in the Breckland SAC as the only occurrence of this habitat type in the UK. The SAC has one of the best-preserved systems of active inland sand dunes in the UK. The habitat type, which is in part characterised by the nationally rare grey hair-grass *Corynephorus canescens* occurring here at its only inland station, is associated with open conditions with active sand movement. The site shows the colonisation sequence from open sand to acidic grass-heath. **H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation; Naturally nutrient-rich lakes or lochs which are often dominated by pondweed -** The Breckland meres in Norfolk represent natural eutrophic lakes in the east of England. They are examples of hollows within glacial outwash deposits and are fed by water from the underlying chalk aquifer. Natural fluctuations in groundwater tables mean that these lakes occasionally dry out. The flora is dominated by stonewort – pondweed *Characeae – Potamogetonaceae* associations. **H4030 European dry heaths** - The dry heaths of Breckland are representative of **European dry heaths** in East Anglia, in eastern England, developed under a semi-continental climate. Breckland has an average annual precipitation of only 600 mm, relatively hot summers and cold winters. Frosts can occur in any month of the year. The dry acidic heath of Breckland represents H1 *Calluna vulgaris – Festuca ovina* heath in the SAC series. The sand sedge-dominated *Carex arenaria* sub-community (H1d) is typical of areas of blown sand – a very unusual feature of this location. The highly variable soils of Breckland, with underlying chalk being largely covered with wind-blown sands, have resulted in mosaics of heather-dominated heathland, acidic grassland and calcareous grassland that are unlike those of any other site. In many places there is a linear or patterned distribution of heath and grassland, arising from fossilised soil patterns that formed under peri-glacial conditions. Breckland is important for rare plants, such as perennial knawel *Scleranthus perennis* ssp. *prostratus*, and rare invertebrates.. **H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco-Brometalia*; Dry grasslands and scrublands on chalk or limestone** - Breckland in East Anglia is the most extensive surviving area of the rare grassland type CG7 *Festuca ovina – Hieracium pilosella – Thymus praecox* grassland. The grassland is rich in rare species typical of dry, winter-cold, continental areas, and approaches the features of grassland types in central Europe more than almost any other semi-natural dry grassland found in the UK. The terrain is relatively flat, with few physical variations, but there are mosaics of calcareous grassland and heath/acid grassland, giving rise to patterns of structural variation. **H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior Alno-Padion, Alnion incanae, Salicion albae*; Alder woodland on floodplains* -** This habitat is supported by surface and/or groundwater and therefore water quality and quantity are critical to maintain the habitat. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. **S1166 *Triturus cristatus*; Great crested newt -** GCN is the largest native British newt. Newts require aquatic habitats for breeding. Eggs are laid singly on pond vegetation in spring, and larvae develop over summer to emerge in August – October, normally taking 2–4 years to reach maturity.	

Habitats Site name:	Breckland SAC (UK0019865)
Current conservation status (JNCC, 2019, Article 17[108] and Article 12[109])	**H2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands** **Overall assessment of conservation status:** Unfavourable - inadequate (range: favourable, area: favourable, structure and function: favourable, future prospects: unfavourable - inadequate). **Overall trend in conservation status:** stable **Main pressure and threats:** Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02) **H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation** **Overall assessment of conservation status:** Unfavourable-bad (range: favourable, area: favourable, structure and function: unfavourable – bad, future prospects: unfavourable - bad). **Overall trend in conservation status:** Deteriorating **Main pressure and threats:** Intensive grazing or overgrazing by livestock (A09), Agricultural activities generating point source pollution to surface or ground waters (A25), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12), Management of fishing stocks and game (G08), Invasive alien species of Union concern (I01), Other invasive alien species (other then species of Union concern) (I02), Modification of hydrological flow (K04), Intensive grazing or overgrazing by livestock (A09), Agricultural activities generating point source pollution to surface or ground waters (A25), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Sports, tourism and leisure activities (F07), Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12) **H4030 European dry heaths** **Overall assessment of conservation status:** Unfavourable-bad (range: favourable, area: favourable, structure and function: unfavourable – bad, future prospects: unfavourable - bad). **Overall trend in conservation status:** Improving **Main pressure and threats:** Intensive grazing or overgrazing by livestock (A09), Extensive grazing or undergrazing by livestock (A10), Burning for agriculture (A11), Suppression of fire for agriculture (A12), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Wind, wave and tidal power, including infrastructure (D01), Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02), Management of fishing stocks and game (G08), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03), Intensive grazing or overgrazing by livestock (A09), Extensive grazing or undergrazing by livestock (A10), Burning for agriculture (A11), Suppression of fire for agriculture (A12), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Wind, wave and tidal power, including infrastructure (D01), Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02), Management of fishing stocks and game (G08), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03) **H6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates *Festuco-Brometalia***

[108] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[109] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitats Site name:	Breckland SAC (UK0019865)
	Overall assessment of conservation status: Unfavourable-bad (range: favourable, area: favourable, structure and function: unfavourable – bad, future prospects: unfavourable - bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02), Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Intensive grazing or overgrazing by livestock (A09), Extensive grazing or undergrazing by livestock (A10), Application of synthetic (mineral) fertilisers on agricultural land (A20), Use of plant protection chemicals in agriculture (A21), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Droughts and decreases in precipitation due to climate change (N02), Increases or changes in precipitation due to climate change (N03), Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02), Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Intensive grazing or overgrazing by livestock (A09), Extensive grazing or undergrazing by livestock (A10), Application of synthetic (mineral) fertilisers on agricultural land (A20), Use of plant protection chemicals in agriculture (A21), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Droughts and decreases in precipitation due to climate change (N02), Increases or changes in precipitation due to climate change (N03) **H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior Alno-Padion, Alnion incanae, Salicion albae*** **Overall assessment of conservation status:** Unfavourable-bad (range: favourable, area: unfavourable - inadequate, structure and function: unfavourable – bad, future prospects: unfavourable - bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Intensive grazing or overgrazing by livestock (A09), Modification of hydrological flow or physical alteration of water bodies for agriculture (excluding development and operation of dams) (A33), Problematic native species (I04), Plant and animal diseases, pathogens and pests (I05), Mixed source air pollution, air-borne pollutants (J03), Modification of hydrological flow (K04), Intensive grazing or overgrazing by livestock (A09), Modification of hydrological flow or physical alteration of water bodies for agriculture (excluding development and operation of dams) (A33), Problematic native species (I04), Plant and animal diseases, pathogens and pests (I05), Mixed source air pollution, air-borne pollutants (J03), Modification of hydrological flow (K04) **S1166 *Triturus cristatus*; Great crested newt** **Overall assessment of conservation status:** Unfavourable - Inadequate (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - Inadequate, future prospects: Unfavourable - Inadequate). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05), Agricultural activities generating point source pollution to surface or ground waters (A25), Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01), Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01), Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F03), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Modification of hydrological flow (K04), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Change of habitat location, size, and / or quality due to climate change (N05), Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05), Agricultural activities generating point source pollution to surface or ground waters (A25), Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01), Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01), Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F03), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Modification of hydrological flow (K04), Natural succession resulting in species composition change (other than by direct changes

Habitats Site name:	Breckland SAC (UK0019865)
	of agricultural or forestry practices) (L02), Interspecific relations (competition, predation, parasitism, pathogens) (L06), Change of habitat location, size, and / or quality due to climate change (N05)
Conservation objectives:	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 qualifying natural habitats and habitats of qualifying species The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of qualifying species The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of qualifying species, and, The distribution of qualifying species within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[110].	Barnhamcross Common SSSI: 55.11% unfavourable – recovering, 44.89% unfavourable - no change Berner's Heath, Icklingham SSSI: 97.09% favourable, 2.91% destroyed Bridgham & Brettenham Heaths SSSI: 12.75% favourable, 87.25% unfavourable – recovering Cavenham - Icklingham Heaths SSSI: 2.52% favourable, 45.88% unfavourable – recovering, 49.00% unfavourable - no change, 2.59% destroyed Cranwich Camp SSSI: 100.00% unfavourable – recovering Deadman's Grave, Icklingham SSSI: 68.86% unfavourable – recovering, 31.14% unfavourable - declining East Wretham Heath SSSI: 7.00% favourable, 89.08% unfavourable – recovering, 3.92% unfavourable – declining Field Barn Heaths, Hilborough SSSI: 100.00% unfavourable – recovering Foxhole Heath, Eriswell SSSI: 100.00% favourable Gooderstone Warren SSSI: 100.00% unfavourable – recovering Grime's Graves SSSI: 26.79% favourable, 73.21% unfavourable – recovering Lakenheath Warren SSSI: 1.62% favourable, 63.40% unfavourable – recovering, 34.99% unfavourable - no change RAF Lakenheath SSSI: 100.00% unfavourable – declining Stanford Training Area SSSI: 9.74% favourable, 1.75% unfavourable – recovering, 88.51% unfavourable - declining Thetford Golf Course & Marsh SSSI: 3.12% favourable, 67.83% unfavourable – recovering, 29.05% unfavourable - no change Thetford Heaths SSSI: 36.32% favourable, 57.06% unfavourable – recovering, 6.62% unfavourable - no change Wangford Warren and Carr SSSI: 22.65% favourable, 77.35% unfavourable – recovering, 34.99% unfavourable - no change Weather and Horn Heaths, Eriswell SSSI: 97.77% unfavourable - declining, 2.23% partially destroyed Weeting Heath SSSI: 40.15% favourable, 38.97% unfavourable – recovering, 20.88% unfavourable - no change
Site Improvement Plan (SIP)	1 Lack of ground disturbance: A133(B) Stone curlew, A246(B) Woodlark, H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Create/maintain bare ground through agri-environment agreements and appropriate rabbit management

[110] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Breckland SAC (UK0019865)
	2 Undergrazing: A133(B) Stone curlew, A246(B) Woodlark, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Increase/maintain intensity of grazing and implement appropriate regimes through agri-environment/advic
	3 Forestry and woodland management: A224(B) European nightjar, A246(B) Woodlark - Increase woodlark and nightjar density
	4 Water Pollution: H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed - Reduce nutrients through agri-environment/Diffuse Water Pollution Plans, and identify actions for the river basin management plan
	5 Changes in species distributions: H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Implement monitoring, habitat management and recovery programmes for rare/scarce plants
	6 Changes in species distributions: H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Implement habitat management and recovery programmes for lichens through agri-environment
	7 Stone curlew monitoring and intervention: A133(B) Stone curlew - Ensure that arable nesting stone curlew are productive through monitoring and intervention
	8 Planning Permission: general: A133(B) Stone curlew, A224(B) European nightjar, A246(B) Woodlark - Develop evidence to assist with determination of planning applications to prevent unsustainable development impacting SPA species
	9 Monitoring: A133(B) Stone curlew: Investigate/secure funding for the continued appropriate monitoring of SPA species
	10 Air Pollution: impact of atmospheric nitrogen deposition: A133(B) Stone curlew, A246(B) Woodlark, H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Further investigate potential nitrogen impacts on the SAC/SPA
	11 Public Access/Disturbance: A224(B) European nightjar, A246(B) Woodlark - Investigate impacts of recreational disturbance on SPA species and address visitor impacts through management
	12 Climate change: A133(B) Stone curlew, A246(B) Woodlark, H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Investigate the potential effects of climate change on vegetation/species
	13 Changes in species distributions: H4030 European dry heaths - Investigate heather die-back to determine the causes, and identify potential remedies
	14 Inappropriate scrub control: A133(B) Stone curlew, A246(B) Woodlark, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Large scale tree/scrub removal funded through agri-environment agreements
	15 Inappropriate management practices: A133(B) Stone curlew, A246(B) Woodlark, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Review the site management of heather through agri-environment agreements
	16 Habitat fragmentation: H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Investigate options to increase habitat connectivity across the landscape
	17 Inappropriate weed control: A133(B) Stone curlew, A246(B) Woodlark, H2330 Open grassland with grey-hair grass and common bent grass of inland dunes, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Investigate effective control methods for wood small-reed Calamagrostis epigejos.
	18 Inappropriate pest control: A133(B) Stone curlew, A224(B) European nightjar, A246(B) Woodlark - Investigate the impacts of predation on breeding success of Woodlark and Nightjar
	19 Changes in species distributions: H2330 Open grassland with grey-hair grass and common bent grass of inland dunes - Investigate the decline of grey-hair grass, and implement management recommendations

Habitats Site name:	Breckland SAC (UK0019865)	
	20 Inappropriate cutting/mowing: H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites) - Introduction of an optimal mowing/cutting regime funded through agri-environment agreement	
Potential effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Wellington Wellfield (Stoke Ferry & Marham WTW)	The proposed drought permit is to increase the daily licenced abstraction of the Wellington Wellfield and Denton Lodge groundwater source by a maximum of 2.726 Ml/d to 25 Ml/d total output for six months. The extra 2.736 Ml/d will likely come from a combination of the Wellington Wellfield and Denton Lodge sources. To allow this extra abstraction the annual licence would be increased by 2,747.5 Ml, from 3,655 Ml/yr to 6,402.5 Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The Breckland SAC covers 7,543.5ha and comprises a series of units underpinned by a large number of SSSIs, including the nearest SSSIs: Cranwich Camp SSSI, Weeting Heath SSSI, Grime's Graves SSSI, Wangford Warren and Carr SSSI, RAF Lakenheath SSSI and Stanford Training Area SSSI. The groundwater ZoI for this drought permit has been defined as approximately 13km from the Wellington Wellfield sources, only including areas where groundwater drawdowns in relevant hydrogeological 'layers' is more than 0.01m greater in the drought permit scenario compared to the fully licenced baseline scenario. This updated ZoI encompasses various units of the Breckland SAC. The SAC is located on a highly productive, fractured chalk aquifer and therefore, is hydrologically connected with the proposed option. Modelling has shown that baseline groundwater level depths range between 1.69 - 24.5m (summer) and 0.98 - 23.3m (winter) (see Section 4.3.1 in DP25 Wellington Wellfield EAR). The minimum groundwater levels may decrease by 0.26m in summer and 0.22m in winter. Impacts during the summer can be screened out as the groundwater is not high enough where abstraction will cause Groundwater Dependent Terrestrial Ecosystem's (GWDTE's) conditions to decrease, therefore, impacts in summer are negligible. The closest area of the SAC with groundwater dependent qualifying features is associated with the Stanford Training Area SSSI, which is within an approximate 7km radius of the sources. Other areas of the SAC consist of calcareous grassland, acid grassland, heathland and arable land which are reliant on surface water supply. **<u>Habitat Features:</u> H2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: Inland dunes have been identified within Wangford Warren and adjoining parts of RAF Lakenheath, both located within the ZoI. Inland dunes are considered water-dependant. This habitat feature comprises a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions. Therefore any changes to the soil moisture may have an adverse effect upon the qualifying feature. The reduction in water may result in changes to the vegetation composition of the SAC. Impacts on groundwater levels are assessed as moderate in winter. On that basis, LSE cannot be ruled out at this stage due to groundwater supply reductions during the winter period and the potential impact on groundwater dependent qualifying features of the Breckland SAC.	**Yes**
	<u>Habitat Features:</u> H3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation	**Yes**

Habitats Site name:	Breckland SAC (UK0019865)	
	Construction: There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: Those lakes are aquifer-fed naturally fluctuating water bodies. Given that the ground water levels in are already fairly low for GWDTE's (0.98m) and the abstractions may reduce this by a further 0.22m, this may result in the lakes being unable to replenish. Therefore, LSE cannot be ruled out at this stage.	
	Habitat Features: H4030 European dry heaths **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: European dry heaths are considered water-dependant. Any changes to the soil moisture may have a LSE upon the qualifying feature. The reduction in water may result in changes to the vegetation composition of the SAC. On that basis, LSE cannot be ruled out at this stage due to groundwater supply reductions and the potential impact on groundwater dependent qualifying features of the Breckland SAC.	**Yes**
	Habitat Features: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometelia* (*important orchid sites) **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: Semi-natural dry grasslands and scrubland facies on calcareous substrates are not considered water dependant and therefore no LSE or residual effects are anticipated during operation of the drought permit.	**No**
	Habitat Features: H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae* **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: This feature largely occurs on the Stanford Training Area, at the Cavenham-Icklingham Heaths and Thetford Golf Course and Marsh sites, some of which are located within the ZoI of the Drought Option. Any changes to the soil moisture may have a LSE upon the qualifying feature through key structural changes and composition. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. Therefore, LSE cannot be ruled out at this stage due to groundwater supply reductions and the potential impact on groundwater dependent qualifying features of the Breckland SAC.	**Yes**
	Species Features: S1166 Great crested newts *Triturus cristatus* **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SAC. **Operation**: Great crested newts (GCN) are known to be present and confined to Stanford Training Area SSSI (latest surveys dated 2010/12) located within the ZoI. Given that the ground water levels in the stress period within Stanford Training Area SSSI may be reduced by 0.07m due to the abstractions, this may result in the water body features being unable to replenish in time for the breeding season[111] (March to June). Therefore, LSE cannot be ruled out at this stage due to groundwater supply reductions and potential impacts upon breeding activities.	**Yes**

[111] It should be noted that with higher temperature recently recorded in February, breeding has previously been observed earlier in the season.

Table AN- 3: Stage 1 Screening of Essex Estuaries SAC

Habitats Site name:	**Essex Estuaries SAC (UK0013690)**	
Designation type and location	SAC, TM05511963	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**1130 Estuaries** - This is a large estuarine site in south-east England, and is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach rivers and is important as an extensive area of contiguous estuarine habitat. Essex Estuaries contains a very wide range of characteristic marine and estuarine sediment communities and some diverse and unusual marine communities in the lower reaches, including rich sponge communities on mixed, tide-swept substrates. Sublittoral areas have a very rich invertebrate fauna, including the reef-building worm *Sabellaria spinulosa*, the brittlestar *Ophiothrix fragilis*, crustaceans and ascidians. The site also has large areas of saltmarsh and other important coastal habitats. **1140 Mudflats and sandflats not covered by seawater at low tide** - Essex Estuaries represents the range of variation of this habitat type found in south-east England and includes the extensive intertidal mudflats and sandflats of the Colne, Blackwater, Roach and Crouch estuaries, Dengie Flats and Maplin Sands. The area includes a wide range of sediment flat communities, from estuarine muds, sands and muddy sands to fully saline, sandy mudflats with extensive growths of eelgrass Zostera spp. on the open coast. The open coast areas of Maplin Sands and Dengie Flats have very extensive mudflats and an unusually undisturbed nature. Maplin Sands is particularly important for its large, nationally-important beds of dwarf eelgrass *Zostera noltei* and associated animal communities. **1310 *Salicornia* and other annuals colonizing mud and sand -** Glasswort *Salicornia spp*. saltmarsh in the Essex estuaries on the east coast of England forms an integral part of the transition from the extensive and varied intertidal mud and sandflats through to upper salt meadows. Although the saltmarshes in this area are generally eroding, secondary pioneer communities appear as a precursor to erosion on the seaward edge of degraded mid-marsh communities. The area of pioneer marsh includes gradation into extensive cord-grass *Spartina spp*. **1320 *Spartina* swards *Spartinion maritimae*** - The most extensive remaining stand of the native small cord-grass *Spartina maritima* in the UK and possibly in Europe is found in the Essex Estuaries. The stand is located at Foulness Point and covers approximately 0.17 ha. Other smaller stands are found elsewhere in the estuary complex, notably in the Colne estuary, where it forms a major component of the upper marsh areas. **1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae* -** Although the saltmarshes in this area are generally eroding, extensive salt meadows remain and Essex Estuaries represents Atlantic salt meadows in south-east England, with floristic features typical of this part of the UK. Golden samphire *Inula crithmoides* is a characteristic species of these marshes, occurring both on the lower marsh and on the drift-line. It represents a community of south-east England also found to the south in mainland Europe. **1420 Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticosi* -** In this complex of estuarine marshes on the east coast of England the occurrence of Mediterranean and thermo-Atlantic *halophilous* scrubs is currently artificially restricted by sea-walls. It now occurs principally as a strandline community or at the foot of sea-walls. Recent managed retreat schemes offer the prospect of future expansion of the habitat type. The local variant of this vegetation, which features sea-lavenders *Limonium spp*. and sea-heath *Frankenia laevis*, occurs only at Colne Point.	

Habitats Site name:	Essex Estuaries SAC (UK0013690)
	1110 Sandbanks which are slightly covered by sea water all the time - Sandbanks which are slightly covered by sea water all the time are comprised of sandy sediments that are permanently covered by shallow sea water. This feature can support a range of communities which are largely determined by sediment type together with a variety of other physical, chemical and hydrographic factors[32] This feature within the Essex Estuaries SAC comprises two subfeatures; subtidal coarse sediment, subtidal sands and subtidal seagrass beds.
Current conservation status (Article 17, JNCC, 2019[112])	**1130 Estuaries** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Unknown **Main pressures and threats:** Agricultural activities generating marine pollution, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Deposition and treatment of waste/garbage from commercial and industrial facilities, Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Other invasive alien species (other then species of Union concern), Mixed source marine water pollution (marine and coastal), Temperature changes (e.g. rise of temperature & extremes) due to climate change, Sea-level and wave exposure changes due to climate change, Agricultural activities generating marine pollution, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam). **1140 Mudflats and sandflats not covered by seawater at low tide** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Unknown **Main pressures and threats:** Agricultural activities generating marine pollution, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture, Other invasive alien species (other than species of Union concern), Mixed source marine water pollution (marine and coastal), Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture.

[112] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	Essex Estuaries SAC (UK0013690)
	1310 Salicornia and other annuals colonizing mud and sand **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Unknown **Main pressures and threats:** Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **71320 Spartina swards *Spartinion maritimae*** **Overall assessment of conservation status**: Unfavourable/bad (range – unfavourable/bad; area – unfavourable/bad; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Deteriorating **Main pressures and threats:** Intensive grazing or overgrazing by livestock, Intrusive and destructive research and monitoring activities, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Intrusive and destructive research and monitoring activities, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Deteriorating **Main pressures and threats:** Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change.

Habitats Site name:	Essex Estuaries SAC (UK0013690)
	1420 Mediterranean and thermo-Atlantic halophilous scrubs *Sarcocornetea fruticosi* **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad;) **Overall trend in conservation status**: Stable **Main pressures and threats:** Intensive grazing or overgrazing by livestock, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **1110 Sandbanks which are slightly covered by sea water all the time** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad) **Overall trend in conservation status**: Unknown **Main pressures and threats:** Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Transmission of electricity and communications (cables) (D06), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Other invasive alien species (other then species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Sea-level and wave exposure changes due to climate change (N04), Threat Ranking Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Change of habitat location, size, and / or quality due to climate change (N05), Desynchronisation of biological / ecological processes due to climate change (N06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change
Conservation objectives:	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 qualifying natural habitats; The structure and function (including typical species) of qualifying natural habitats; and The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
SSSI Condition assessment	Blackwater Estuary SSSI: 23.51% favourable; 74.94% unfavourable – recovering; 1.52% unfavourable – declining; partially destroyed 0.04%. Colne Estuary SSSI: 25.26% favourable; 74.57% unfavourable – recovering; 0.18% unfavourable – declining. Crouch and Roach Estuaries SSSI: 28.02% favourable; 71.35% unfavourable – recovering; 0.63% unfavourable – no change.

Habitats Site name:	Essex Estuaries SAC (UK0013690)
(**Appendix 2** for detailed per unit)[113].	Dengie SSSI: 37.23% unfavourable – recovering; 62.77% unfavourable – declining. Foulness SSSI: 1.45% favourable; 24.68% unfavourable – recovering; 0.02% unfavourable – no change; 73.85% unfavourable – declining.
Site Improvement Plan (SIP)	1 Coastal squeeze – Pressure/Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage – Investigate impacts on the site to inform development of remedial actions. 2 Public Access/Disturbance – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage - Analyse disturbance effects and manage public access to minimise disturbance. 3 Fisheries: Commercial marine and estuarine - Pressure/Threat: H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Where the assessments indicate management is required, introduce appropriate measures. 4 Planning Permission: general – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Blacktailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Collate and analyse data to develop guidance for the site. 5 Changes in species distributions – Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A151(NB) Ruff, A157(NB) Bar-tailed godwit, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage: Investigate site level and larger scale factors affecting the declining SPA species. 6 Invasive species – Pressure/Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage - Investigate impacts of Pacific oyster and other non-native marine species and identify possible management. 7 Fisheries: Recreational marine and estuarine – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Investigate the extent of impact of bait digging on the site. 8 Fisheries: Commercial marine and estuarine - Pressure/ Threat: A046a(NB) Dark-bellied Brent goose, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Introduce new byelaw for bottom towed gear, and ensure compliance.

[113] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Essex Estuaries SAC (UK0013690)	
	9 Fisheries: Commercial marine and estuarine - Pressure/ Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage - Investigate and assess potential pressures from private and several fisheries, and identify possible management. 10 Invasive species – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1320 Cord-grass swards, Waterbird assemblage - Monitor Spartina anglica and assess effects on interest features. 11 Air Pollution: risk of atmospheric nitrogen deposition – Pressure: A046a(NB) Dark-bellied Brent goose, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1130 Estuaries, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub - Investigate potential atmospheric nitrogen impacts.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Lower Colne (Ardleigh Reservoir)	The drought permit licence will increase the daily licence at Balkerne by 3Ml/d (6Ml/d to 9Ml/d), for the purpose of additional augmentation to the river from Balkerne. The daily licence rates for Aldham and Cooks Mill stay the same but allows the sources to run at 6 Ml/d for 6 months i.e. for the transfer of water directly into the supply system at up to 6Ml/d. The augmentation and public water supply parts of the instantaneous, annual and group licence conditions will be amended to take into account usage during a six-month drought permit. Essex Estuaries SAC is within an approximate 7km radius of the abstraction point at Balkerne. Potential impact pathways include reduced flow rates in the River Colne, reduced groundwater refilling rates, water quality deterioration and increased siltation. This could have an impact on all water dependant qualifying habitats in the SAC. **Habitat Features: 1130 Estuaries** **Construction:** There is no construction phase associated with this Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, within the River Colne. The drought permit may therefore result in temporary impacts upon surrounding habitats including estuaries. Due to strong hydrological connectivity with the abstraction point, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**
	Habitat Features: 1140 Mudflats and sandflats not covered by seawater at low tide **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, particularly during low-flow periods, within the River Colne A change in freshwater inflow may alter nutrient dynamics and affect invertebrate prey abundance through changes in salinity and sediment chemistry. Due to strong hydrological connectivity with the abstraction point, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**

Habitats Site name:	Essex Estuaries SAC (UK0013690)	
	Habitat Features: 1310 *Salicornia* and other annuals colonising mud and sand **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, within the River Colne. Due to strong hydrological connectivity with the abstraction point, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**
	Habitat Features: 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae* **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, within the River Colne. Higher salinity and altered inundation patterns during drought could shift species composition toward more salt-tolerant species, reducing habitat diversity. Due to strong hydrological connectivity with the abstraction point, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**
	Habitat Features: 1420 Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticosi* **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, within the River Colne. Due to strong hydrological connectivity with the abstraction point, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**
	Habitat Features: 1110 Sandbanks slightly covered by seawater all the time **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Essex Estuaries SAC. **Operation:** The proposed temporary increase in abstraction may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats, within the River Colne. The drought permit may therefore result in temporary impacts upon surrounding habitats including sandbanks which are influenced by tidal currents and sediment supply. A change in freshwater inflow could subtly alter sediment deposition patterns and salinity. Due to the potential impacts anticipated upon the River Colne, LSEs during operation of the drought permit cannot be ruled out for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**

Table AN- 4: Stage 1 Screening of Eversden and Wimpole Woods SAC

Habitats Site name:	**Eversden and Wimpole Woods SAC (UK0030331)**	
Designation type and location	SAC, TL340526	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**S1308 Barbastelle *Barbastella barbastellus*** - The site comprises a mixture of ancient coppice woodland (Eversden Wood) and high forest woods likely to be of more recent origin (Wimpole Woods). A colony of barbastelle *Barbastella barbastellus* is associated with the trees in Wimpole Woods. These trees are used as a summer maternity roost where the female bats gather to give birth and rear their young. Most of the roost sites are within tree crevices. The bats also use the site as a foraging area. Some of the woodland is also used as a flight path when bats forage outside the site.	
Current conservation status (Article 17, JNCC, 2019[114])	**S1308 Barbastelle *Barbastella barbastellus*** **Overall assessment of conservation status**: Unknown (range: favourable, population: unknown, habitat for the species: unknown, future prospects: unknown). **Overall trend in conservation status**: Unknown. **Main pressure and threats**: Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02), Drainage for use as agri cultural land (A31), Conversion to other types of forests including monocultures (B02), Logging without replanting or natural reg rowth (B05), Logging (excluding clear cutting) of individual trees (B06), Removal of dead and dying trees, including debris (B07), Removal of old trees (excluding dead or dying trees) (B08), Clear-cutting, removal of all trees (B09), Application of synthetic fertilisers in forestry, including liming of forest soils (B19), Removal of old trees (excluding dead or dying trees) (B08), Clear-cutting, removal of all trees (B09), Application of synthetic fertilisers in forestry, including liming of forest soils (B19), Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02), Drainage for use as agricultural land (A31), Conv ersion to other types of forests including monocultures (B02), Logging without replanting or natural regrowth (B05), Logging (excluding clear cutting) of individual trees (B06), Removal of dead and dying trees, including debris (B07)	
Conservation objectives:	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, and, • The distribution of qualifying species within the site	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[115].	Barnack Hills & Holes SSSI: 40.01% favourable, 59.99% Unfavourable - Recovering	

[114] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[115] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Eversden and Wimpole Woods SAC (UK0030331)	
Site Improvement Plan (SIP)	1. Feature location/ extent/ condition unknown – S1308 Barbastelle bat: Survey additional areas for Barbastelle bats. 2. Offsite habitat availability/ management – S1308 Barbastelle bat: Research to identify areas and habitats used by the bats off the SAC, and secure suitable management in order to maintain, enhance and increase the supporting habitat. 3. Forestry and woodland management – S1308 Barbastelle bat: Manage the woodland appropriately. 4. Air Pollution: impact of atmospheric nitrogen deposition - S1308 Barbastelle bat: Investigate effects of atmospheric nitrogen on the site.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Gt Ouse (Grafham Water)	Under the proposed drought permit conditions, 2 stages of abstraction are permitted: Stage 1 - abstraction at up to 100% of the flow in excess of the MRF, stage 2 - 50% reduction MRF to 68 Ml/d, abstraction at up to 75% of the flow excess of the MRF. The Offord intake is within an approximate 20km radius of the Eversden and Wimpole Woods SAC. **Species Feature: S1308 Barbastelle *Barbastella barbastellus*** **Construction**: There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Eversden and Wimpole Woods SAC. **Operation**: A colony of barbastelle bats is associated with the trees in Wimpole Woods. These trees are used as a summer maternity roost where the female bats gather to give birth and rear their young. Most of the roost sites are within tree crevices. The bats also use the SAC as a foraging area. Some of the woodland is also used as a flight path when bats forage outside the SAC boundaries. Barbastelle bats are not considered water dependant; however, they travel up to 20km for foraging activities. However, the Supplementary advice to the conservation objectives (SACO) refers to the population as '*foraging up to 5 to 7km from their maternity roosts with some individuals in less favourable habitat may forage further to reach suitable feeding grounds'*. Implementation of the Drought Action is not considered to have any impact upon groundwater; therefore, it is considered unlikely that the Drought Action would result in adverse impacts upon Functionally Linked Habitats, over 18km from the SAC. Therefore, no LSE are anticipated during operation of the drought permit.	**No**

Table AN- 5: Stage 1 Screening of Humber Estuary SAC

Habitat site name:	Humber Estuary SAC (UK0030170)	
Designation type and location	SAC, TA06562547	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) -** Some areas of saltmarsh are grazed, for example at Spurn, Welwick and Sunk Island on the north bank, and Alkborough, Whitton, Winteringham to South Ferriby on the south bank, which can provide habitat for SPA waterbirds. The marsh provides a high tide refuge for internationally and nationally important wading birds and wildfowl such as oystercatcher, bar tailed godwit, knot and dunlin, which feed on the adjacent mudflats, and provides suitable habitat for nationally important breeding birds such as redshank, oystercatcher and lapwing. Saltmarsh offers sheltered nursery sites for several species of fish and supports many rare invertebrates, particularly in areas with high structural plant diversity and where freshwater seepage provides a transition to brackish conditions.	

Habitat site name:	Humber Estuary SAC (UK0030170)
	H1150 Coastal lagoons - Two qualifying coastal lagoons areas are located within the Humber Estuary SAC boundary - Humberston Fitties and Northcoates Lagoon, both located in the south east of the site. The invertebrate fauna of the lagoons includes a nationally scarce species; the lagoon sand-shrimp Gammarus insensibilis. In particular, Humberston Fitties supports diverse communities of several lagoon specialist species and has been described as the third most important lagoon in Britain, in addition to being the most northerly site in Europe for the lagoon sand-shrimp, an amphipod protected under Schedule 5 of the Wildlife and Countryside Act 1981. **H2160 Dunes with *Hippophae rhamnoides* -** Comprise scrub vegetation on more-or-less stable sand dunes in which sea-buckthorn *H. rhamnoides* is abundant. Sea-buckthorn may either form dense thickets, with sparse nitrophilous associates such as common nettle *Urtica dioica*, or occur as more scattered bushes interspersed with various grasses, typically marram *Ammophila arenaria* and red fescue *Festuca rubra*, and associated herbs of dune grassland. **H2110 Embryonic shifting dunes** - Embryonic shifting dune vegetation exists in a highly dynamic state and is dependent on the continued operation of physical processes at the dune/beach interface. It is the first type of vegetation to colonise areas of incipient dune formation at the top of a beach. On a prograding dune system this vegetation may be the precursor to the main dune-building vegetation dominated by marram *Ammophila arenaria*. In most cases Embryonic shifting dunes are transient and will either be displaced by marram-dominated vegetation as the dunes develop or will be washed away by storms. **H1130 Estuaries -** The Humber is the second-largest coastal plain estuary in the UK, and the largest coastal plain estuary on the east coast of Britain. It is a muddy, macro-tidal estuary, fed by the Rivers Ouse, Trent and Hull, Ancholme and Graveney. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holderness coast. This is the northernmost of the English east coast estuaries whose structure and function is intimately linked with soft eroding shorelines. Habitats within the Humber Estuary include 1330 Atlantic salt meadows and a range of sand dune types in the outer estuary, together with subtidal sandbanks (H1110 Sandbanks which are slightly covered by sea water all the time), extensive intertidal mudflats (H1140 Mudflats and sandflats not covered by seawater at low tide), glasswort beds (H1310 Salicornia and other annuals colonising mud and sand), and 1150 coastal lagoons. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary. These are best-represented at the confluence of the Rivers Ouse and Trent at Blacktoft Sands. Upstream from the Humber Bridge, the navigation channel undergoes major shifts from north to south banks, for reasons that have yet to be fully explained. This section of the estuary is also noteworthy for extensive mud and sand bars, which in places form semi-permanent islands. Significant fish species include 1099 river lamprey *Lampetra fluviatilis* and 1095 sea lamprey *Petromyzon marinus* which breed in the River Derwent, a tributary of the River Ouse. **H2130 Fixed dunes with herbaceous vegetation ("Grey dunes")** - Fixed dune vegetation occurs mainly on the largest dune systems, being those that have the width to allow it to develop. It typically occurs inland of the zone dominated by marram *Ammophila arenaria* on coastal dunes, and represents the vegetation that replaces marram as the dune stabilises and the organic content of the sand increases. **S1364 Grey seal (*Halichoerus grypus*) -** The Humber Estuary SAC is home to a significant breeding population of the grey seal, *Halichoerus grypus.* Donna Nook supports a large and rapidly increasing grey seal breeding colony - the largest in the area – comprising c6,850 individuals. Grey seals are present there throughout the year and in 2016 the Lincolnshire Wildlife Trust estimated a grey seal population of c.6850, using the standard estimate for grey seal populations (pup number 1,959 multiplied by 3.5). Individual grey seals from the Humber Estuary have been tracked foraging as far as Dogger Bank, the Wash and the Farne Islands, and regularly travel 230km out to sea from their haul-out site, with trips lasting up to 5 days. **H1140 Mudflats and sandflats not covered by seawater at low tide -** The Humber Estuary includes extensive intertidal mudflats and sandflats not covered by seawater at low tide. Upstream from the Humber Bridge, extensive mud and sand bars in places form semi-permanent islands.

Habitat site name:	Humber Estuary SAC (UK0030170)
	S1099 River lamprey (*Lampetra fluviatilis*) - River lamprey begin their migration from the North Sea to spawning sites in the River Ouse, River Derwent and Trent tributaries between November and March, although they have been recorded as early as October. As adults they have a parasitic lifestyle at sea or in the estuarine environment but return to freshwater to spawn. During migration, the Humber catchment provides ideal habitats for nocturnal activity such as daytime shelter under rocks, tree roots and overhanging branches. In all, the Humber basin provides an excellent habitat for river lamprey feeding, shelter, reproduction and migration across all life stages, and is considered the most important river lamprey habitat potentially supporting the largest population in the UK. **H1310 Salicornia and other annuals colonising mud and sand -** Within the Humber Estuary SAC, glasswort *Salicornia spp*. (SM8) and annual sea blite Suaeda maritima (SM9) communities are the primary colonising saltmarsh communities present. *Salicornia spp*. and other annuals colonising mud and sand create an accretory environment for finer sediments and increase the localised silt component. This reduces drainage and supports the development of a wide range of main saltmarsh species. The pioneering species first establish a marsh in newly created intertidal areas or managed realignment sites on the Humber. Colonising SM8 and SM9 communities are more dominant at the outer estuary on both the north and south banks with the highest concentrations found along the North Lincolnshire and the Pyewipe-to-Cleethorpes coast. **H1110 Sandbanks which are slightly covered by sea water all the time -** The Humber Estuary has a macro-tidal range, fast flows and a high background suspended sediment content, which leads to the bed of the estuary being very dynamic in its morphology. This is displayed in cyclical variations in the position of channels and banks throughout the estuary. The high mobility of sediments and high turbidity means that this habitat is relatively impoverished. It supports a limited fauna characterised by very low densities of opportunistic species and species adapted to these conditions; principally the amphipod *Eurydice pulchra* and the catworm *Nephtys cirrosa*. Mysid shrimps such as *Gastrosaccus spinifer*, *Schistomysis kervillei* and *Schistomysis spiritus* are also present - species with a high tolerance to stress and ability to withstand sediment disturbance. The subtidal habitat can provide an important breeding, sheltering and nursery area for marine fish species such as plaice and sole as well as acting as a spawning ground for species such as bass. It is possible that the benthic community on the sandbanks acts as a food resource for some species of fish within the estuary. **S1095 Sea lamprey (*Petromyzon marinus*) -** The Humber Estuary provides a migratory corridor from the North Sea to freshwater spawning grounds in the River Ouse catchment. As adults, sea lamprey have a parasitic lifestyle at sea before returning to freshwater to spawn. Rocks and banks in parts of the estuary and catchment rivers provide suitable habitats for daytime respite during sea lamprey migrations upstream at night. The upper reaches of the tidal rivers provide the gravel habitats and the clean fast flowing water required for sea lamprey spawning. Although few ammocoetes (larvae) have been sampled in it, the fine sediments downstream of freshwater spawning sites but upstream of the Humber Estuary SAC provide shelter and a rich food supply of organic matter for 3-5 years until metamorphosis. Decreases in water quality due to industrial waste significantly reduced the number of sea lamprey in the Humber catchment in the past and although the population has begun to recover, reduced dissolved oxygen, slow water flow and temperature changes remain concerns during sea lamprey migratory periods. **H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("White dunes") -** Encompasses most of the vegetation of unstable dunes where there is active sand movement. Under these conditions sand-binding marram *Ammophila arenaria* is always a prominent feature of the vegetation and is usually dominant.
Current conservation status (JNCC,	**1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status**: Deteriorating.

Habitat site name:	Humber Estuary SAC (UK0030170)
2019, Article 17[116] and Article 12[117])	**Main pressure and threats**: Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change **H1150 Coastal lagoons** **Overall assessment of conservation status**: Unfavourable/inadequate (range: favourable, area: favourable, structure and function: unfavourable – inadequate, future prospects: unknown). **Overall trend in conservation status**: Stable. **Main pressure and threats**: Agricultural activities generating marine pollution, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Modification of flooding regimes, flood protection for residential or recreational development, Other invasive alien species (other then species of Union concern), Mixed source marine water pollution (marine and coastal, Modification of hydrological flow, Temperature changes (e.g. rise of temperature & extremes), due to climate change, Increases or changes in precipitation due to climate change, Sea-level and wave exposure changes due to climate change, Change of habitat location, size, and / or quality due to climate change, Agricultural activities generating marine pollution, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Modification of flooding regimes, flood protection for residential or recreational development, Other invasive alien species (other than species of Union concern), Modification of hydrological flow, Temperature changes (e.g. rise of temperature & extremes), due to climate change, Increases or changes in precipitation due to climate change, Sea-level and wave exposure changes due to climate change, Change of habitat location, size, and / or quality due to climate change, Change of species distribution (natural newcomers), due to climate change, **H2160 Dunes with *Hippophae rhamnoides*** **Overall assessment of conservation status**: Unfavourable - Bad (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - Bad, future prospects: Unfavourable - Bad). **Overall trend in conservation status**: Deteriorating. **Main pressure and threats**: Mixed source air pollution, air-borne pollutants (J03), Modification of hydrological flow (K04), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices), Mowing or cutting of grasslands (A08), Mixed source air pollution, air-borne pollutants (J03), Modification of hydrological flow (K04), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)

[116] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[117] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitat site name:	Humber Estuary SAC (UK0030170)

H2110 Embryonic shifting dunes

Overall assessment of conservation status: Unfavourable - Bad (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - Bad, future prospects: Unfavourable - Bad).

Overall trend in conservation status: Deteriorating.

Main pressure and threats: Development and maintenance of beach areas for tourism and recreation incl. beach nourishment and beach cleaning (F06), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Other invasive alien species (other then species of Union concern) (I02), Mixed source air pollution, air-borne pollutants (J03), Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization) (L01), Sea-level and wave exposure changes due to climate change (N04), Development and maintenance of beach areas for tourism and recreation incl. beach nourishment and beach cleaning (F06), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Other invasive alien species (other then species of Union concern) (I02), Mixed source air pollution, air-borne pollutants (J03), Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, salinization) (L01), Sea-level and wave exposure changes due to climate change (N04)

1130 Estuaries

Overall assessment of conservation status: Unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad).

Overall trend in conservation status: Unknown.

Main pressure and threats: Agricultural activities generating marine pollution, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Deposition and treatment of waste/garbage from commercial and industrial facilities, Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Other invasive alien species (other then species of Union concern), Mixed source marine water pollution (marine and coastal), Temperature changes (e.g. rise of temperature & extremes) due to climate change, Sea-level and wave exposure changes due to climate change, Agricultural activities generating marine pollution, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam).

H2130 Fixed dunes with herbaceous vegetation ("Grey dunes")

Overall assessment of conservation status: Unfavourable - Bad (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - Bad, future prospects: Unfavourable - Bad).

Overall trend in conservation status: Deteriorating.

Main pressure and threats: Extensive grazing or undergrazing by livestock (A10), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08),

Habitat site name:	Humber Estuary SAC (UK0030170)
	Other invasive alien species (other then species of Union concern) (I02), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Extensive grazing or undergrazing by livestock (A10), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Other invasive alien species (other then species of Union concern) (I02), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02) **S1364 Grey seal (Halichoerus grypus)** **Overall assessment of conservation status**: Favourable (range: favourable, population: favourable, habitat for the species: favourable, future prospects: favourable). **Overall trend in conservation status**: Improving. **Main pressure and threats**: Management of fishing stocks and game (G08), Bycatch and incidental killing (due to fishing and hunting activities) (G12), Interspecific relations (competition, predation, parasitism, pathogens) (L06), Wind, wave and tidal power, including infrastructure (D01), Management of fishing stocks and game (G08), Bycatch and incidental killing (due to fishing and hunting activities) (G12), Interspecific relations (competition, predation, parasitism, pathogens) (L06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change (N07) **H1140 Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats** **Overall assessment of conservation status**: Unfavourable-bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status**: Unknown. **Main pressure and threats**: Agricultural activities generating marine pollution, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture, Other invasive alien species (other than species of Union concern), Mixed source marine water pollution (marine and coastal), Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture. **S1099 River lamprey (*Lampetra fluviatilis*)** **Overall assessment of conservation status**: Favourable (range: favourable, population: favourable, habitat for the species: unknown, future prospects: favourable). **Overall trend in conservation status**: Unknown.

Habitat site name:	Humber Estuary SAC (UK0030170)
	Main pressure and threats: Agricultural activities generating point source pollution to surface or ground waters (A25), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02), Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Drainage (K02), Development and operation of dams (K03), Modification of hydrological flow (K04), Physical alteration of water bodies (K05), Change of habitat location, size, and / or quality due to climate change (N05) **H1310 Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status**: Unknown. **Main pressure and threats**: Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **H1110 Sandbanks which are slightly covered by sea water all the time** **Overall assessment of conservation status**: Unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status**: Unknown. **Main pressure and threats**: Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Transmission of electricity and communications (cables) (D06), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Other invasive alien species (other then species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Sea-level and wave exposure changes due to climate change (N04), Threat Ranking Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Change of habitat location, size, and / or quality due to climate change (N05), Desynchronisation of biological / ecological processes due to climate change (N06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change **S1095 Sea lamprey (*Petromyzon marinus*)** **Overall assessment of conservation status**: Unknown (range: favourable, population: unknown, habitat for the species: unknown, future prospects: unknown).

Habitat site name:	Humber Estuary SAC (UK0030170)
	Overall trend in conservation status: Unknown. **Main pressure and threats**: Agricultural activities generating point source pollution to surface or ground waters (A25), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Hydropower (dams, weirs, run-off-the-river), including infrastructure (D02), Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (F12), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Drainage (K02), Development and operation of dams (K03), Modification of hydrological flow (K04), Physical alteration of water bodies (K05), Change of habitat location, size, and / or quality due to climate change (N05) **H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("White dunes")** **Overall assessment of conservation status**: Unfavourable - Bad (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - Bad, future prospects: Unfavourable - Bad). **Overall trend in conservation status**: Deteriorating. **Main pressure and threats**: Extensive grazing or undergrazing by livestock (A10), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Other invasive alien species (other then species of Union concern) (I02), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02), Extensive grazing or undergrazing by livestock (A10), Conversion to forest from other land uses, or afforestation (excluding drainage) (B01), Sports, tourism and leisure activities (F07), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Other invasive alien species (other then species of Union concern) (I02), Problematic native species (I04), Mixed source air pollution, air-borne pollutants (J03), Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices) (L02)
Conservation objectives:	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 qualifying natural habitats and habitats of qualifying species The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of qualifying species The supporting processes on which qualifying natural habitats and habitats of qualifying species rely The populations of qualifying species, and, The distribution of qualifying species within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[118].	Humber Estuary - 2000480 SSSI: 0.04% favourable, 56.66% unfavourable – recovering, 43.30% unfavourable – declining

[118] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Humber Estuary SAC (UK0030170)
Site Improvement Plan (SIP)	1 Water Pollution: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, S1095 Sea lamprey, S1099 River lamprey, Waterbird assemblage - Investigate the effects of poor water quality on designated features 2 Coastal squeeze: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, Waterbird assemblage - Identify opportunities to compensate for the loss of intertidal habitat 3 Changes in species distributions: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, S1095 Sea lamprey, S1099 River lamprey, Waterbird assemblage - Investigate and address the potential changes in distribution and declines of bird and fish numbers 4 Undergrazing: A140(NB) Golden plover, A143(NB) Red knot, A151(NB) Ruff, A156(NB) Black-tailed godwit, A162(NB) Common redshank, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2160 Dunes with sea buckthorn, Waterbird assemblage - Introduce grazing to affected areas through the delivery of the new Agri-environment scheme 5 Invasive species: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1330 Atlantic salt meadows, Waterbird assemblage - Gain an understanding of the presence of invasive species, and how to address the issue 6 Natural changes to site conditions: A021(B) Bittern, A021(NB) Bittern, A048(B) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Investigations, to gain an understanding of the changing topography and habitats 7 Public Access/Disturbance: A021(B) Bittern, A021(NB) Bittern, A048(NB) Commo shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier A132(B) Avocet, A132(NB) Avocet, A140(NB) Golde plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern H1130 Estuaries, H1330 Atlantic salt meadows, Waterbird assemblage - Work with the recommendation from the Footprint Ecology report to address disturbance issues 8 Fisheries: Fish stocking: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, Waterbird assemblage - Give advice, and work with other organisations to control fish stocking 9 Fisheries: Commercial marine and estuarine: H1140 Intertidal mudflats and sandflats - Indicate where management is necessary and work with organisations to implement these measures 10 Fisheries: Commercial marine and estuarine: H1140 Intertidal mudflats and sandflats - Indicate where management is necessary and work with organisations to implement these measures 11 Direct land take from development: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Identify mechanisms to remove material from the intertidal and prevent further encroachment

Habitat site name:	Humber Estuary SAC (UK0030170)	
	12 Air Pollution: impact of atmospheric nitrogen deposition: H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2160 Dunes with sea-buckthorn - Further investigate potential atmospheric nitrogen impact on the site 13 Shooting/ scaring: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, Waterbird assemblage - Investigate unconsented activities and agree an appropriate way forward 14 Direct impact from third party: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common, shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1310 Glasswort and other annuals colonising mud and sand, Waterbird assemblage - Investigate and monitor the collection of Salicornia and implement management when required 15 Inappropriate scrub control: A081(B) Marsh harrier - Implement appropriate habitat management	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Trent (Hall WTW)	The maximum reduction in flow under the River Trent (Hall WTW) Drought Permit is 40Ml/d when the River Trent flows are below the Hands Off Flow (HOF) condition set at 1,700Ml/d, but above 1,400Ml/d. Potential impact pathways include reduced flow rates in the River Trent, reduced groundwater refilling rates, water quality deterioration and increased siltation. This could have an impact on all water dependant qualifying habitats in the SAC. **Habitat Features: 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain Good Ecology Status (GES) within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: H1150 Coastal lagoons **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**

Habitat site name:	Humber Estuary SAC (UK0030170)	
	Habitat Features: H2160 Dunes with *Hippophae rhamnoides* **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: H2110 Embryonic shifting dunes **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: 1130 Estuaries **Construction:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**

Habitat site name:	Humber Estuary SAC (UK0030170)	
	Habitat Features: H2130 Fixed dunes with herbaceous vegetation ("Grey dunes") **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: S1364 Grey seal (*Halichoerus grypus*) **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: H1140 Mudflats and sandflats not covered by seawater at low tide **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: S1099 River lamprey (*Lampetra fluviatilis*) **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**

Habitat site name:	Humber Estuary SAC (UK0030170)	
	Habitat Features: H1310 Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand **Construction:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: H1110 Sandbanks which are slightly covered by sea water all the time **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Species Features: S1095 Sea lamprey (*Petromyzon marinus*) **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located within an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**
	Habitat Features: H2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("White dunes") **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see River Trent (Hall WTW) EAR Appendix A for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain GES within the Humber River Basin Additionally, the abstraction site is located with an approximate 55km radius of the Humber Estuary SAC via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Given the distance from the existing boreholes and the tidal activity of the SAC, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SAC. Therefore, no LSEs are expected for any features within the SAC as a result of the River Trent (Hall WTW) Drought Permit.	**No**

Table AN- 6: Stage 1 Screening of Nene Washes SAC

Habitat site name:	Nene Washes SAC (UK0030222)	
Designation type and location	SAC, TL30809915	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**S1149 Spined loach, *Cobitis taenia* -** 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, with their associated waterways. The fish has limited means of dispersal so UK populations are largely genetically isolated from each other. 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.	
Current conservation status (JNCC, 2019, Article 17[119] and Article 12[120])	**S6963 Spined loach *Cobitis taenia*** **Overall assessment of conservation status:** Favourable (range: favourable, population: unknown, habitat for the species: favourable, future prospects: favourable). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Physical alteration of water bodies (K05), Modification of hydrological flow (K04), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01)	
Conservation objectives:	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, and, The distribution of qualifying species within the site	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[121].	Nene washes SSSI: 19.96% favourable, 80.04% unfavourable – recovering	
Site Improvement Plan (SIP)	1 Hydrological changes: A037(NB) Bewick's Swan, A050(NB) Wigeon, A051(B) Gadwall, A051(NB) Gadwall, A052(NB) Eurasian teal, A054(NB) Pintail, A055(B) Garganey, A056(B) Shoveler, A056(NB) Shoveler, A119(B) Spotted Crake, A151(B) Ruff, A151(NB) Ruff, A156a(B) Black-tailed Godwit, Waterbird assemblage - Monitoring of birds and water levels and flexible responses to yearly variations through liaison between key partners. 2 Water Pollution: S1149 Spined loach - Undertake a review of water quality in Mortons Leam and ditches.	

[119] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[120] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[121] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name: Potential Effects	Nene Washes SAC (UK0030222)	
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Pitsford water)	The maximum reduction in flow under the River Nene at Duston Mill drought permit is 17.05Ml/d, with the MRF in the Nene reduced from the baseline value of 34.1Ml/d to 17.05Ml/d. This reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate (phosphorus should be below annual mean of 0.1 mgl^{-1}), salinity and increased siltation on submerged macrophyte communities. The reduction in annual Q95 and Q50 is 49.9% and 18.5% respectively, which is assessed as a moderate hydrological impact during winter. This impact could lower water levels and lead to turbidity change which may expose littoral shelves, reduce macrophyte extent, and degrade forage quality. Higher nutrient/longer residence could increase bloom risk leading to reduced water clarity and macrophyte decline. The Pitsford/ Duston Mill intake is within an approximate 65km radius of the Nene Washes SAC and approximately within 85km via hydrological connectivity. **Species feature: S6963 Spined loach *Cobitis taenia*** **Construction** There is no construction phase associated with this drought action **Operation** 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. There may also be thriving populations in the smaller ditches of the Washes. Fish monitoring surveys have been conducted in 20239 and 202410 within the River Nene (including five separate sites upstream and downstream of Wansford Intake, and therefore upstream of the SAC). Five spined loach individuals were recorded in 2023 within the River Nene and more specifically within the Back River directly connected to the Nene Washes SAC (i.e. Moreton's Leam) within Reach 6. The qualifying feature of the SAC is water dependant. Potential impact pathways on the Nene Washes SAC include reduced water flow during operation from December – April and May – November, and deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation. As water levels in the Nene Washes are maintained by inundation and controlled via a Water Level Management Plan, reduced water flow downstream of Rutland/Wansford Intake is unlikely to impact water levels in the Nene Washes. Hydrological impact assessment for the River Nene (Table D4-1) concluded that implementation of the drought permit would result in negligible impacts during the summer and winter months for Reaches 3, 4 and 6 (upstream of the Nene Washes SAC) from Harpers Brook Confluence to the Wansford Abstraction Intake. There is a potential impact pathway on spined loach due to reduced nutrient dilution capacity downstream, however, inputs from Great Billing water recycling centre (WRC), Broadholme WRC and Flag Fen WRC are expected to increase flows downstream of the abstraction point, as well as inputs from associated tributaries of the River Nene. Therefore, no LSEs are anticipated from this drought option.	**No**

Habitat site name:	Nene Washes SAC (UK0030222)	
River Nene (Rutland water)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling of Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr) would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF from 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. The Rutland/ Wansford intake is within an approximate 15km radius of the Nene Washes SAC and approximately within 20km via hydrological connectivity. Potential impact pathways include reduced flow rates in the River Nene, reduced groundwater refilling rates, water quality deterioration and increased siltation. This could have an impact on all water dependant qualifying habitats in the SAC **<u>Species feature:</u> S6963 Spined loach *Cobitis taenia*** **Construction** There is no construction phase associated with this drought action. **Operation** 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. There may also be thriving populations in the smaller ditches of the Washes. Fish monitoring surveys have been conducted in 2023[122] and 2024[123] within the River Nene (including five separate sites upstream and downstream of Wansford Intake). Five spined loach individuals were recorded in 2023 within the River Nene, downstream of Wansford and more specifically within the Back River directly connected to the Nene Washes SAC (i.e. Moreton's Leam). The qualifying feature of the SAC is water dependant. Potential impact pathways on the Nene Washes SAC include reduced water flow during operation from December – April and May – November, and deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation. As water levels in the Nene Washes are maintained by inundation and controlled via a Water Level Management Plan, reduced water flow downstream of Rutland/Wansford Intake is unlikely to impact water levels in the Nene Washes. Operation of this drought option could result in deterioration in water quality due to a reduction in dilution capacity or nutrient concentrations (particularly orthophosphate) and pollutant inputs into the watercourse and an increase in siltation. This could impact on sensitive wetland habitat associated with the Nene Washes. During autumn and winter operation of Rutland/Wansford Intake, the Stanground Sluice is kept open by 6 inches in order to provide a freshening flow and maintain the water levels for designated sites until the growing season begins again. During spring and summer, the Stanground Sluice is kept open, and the Nene Washes will be fully exposed to any changes in water quality, increased siltation and reduced water flow. This could impact on the structure and function of the habitat, particularly the macrophyte communities which support the spined loach. Therefore LSEs cannot be ruled out at this stage.	**Yes**

[122] Atkins & APEM (2023). Drought Permit Monitoring. Prepared for Anglian Water Services.
[123] AECOM, (2024). Fish Survey Workbook 2024. Drought Permit Area: All.

Table AN- 7: Stage 1 Screening of Norfolk Valley Fens SAC

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)	
Designation type and location	SAC, TL937960	**Water Dependent?** All features have been identified as water dependant with the exception of Semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210).
Qualifying features	**7230 Alkaline fens -** Norfolk Valley Fens is one of two sites selected in East Anglia, in eastern England, where the main concentration of lowland Alkaline fens occurs. This site comprises a series of valley-head spring-fed fens. Such spring-fed flush fens are very rare in the lowlands. Most of the vegetation at this site is of the small sedge fen type, mainly referable to M13 *Schoenus nigricans – Juncus subnodulosus* mire, but there are transitions to reed swamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora associated with these fens, including species such as grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris*, marsh helleborine *Epipactis palustris* and narrow-leaved marsh-orchid *Dactylorhiza traunsteineri*. **4010 Northern Atlantic wet heaths with *Erica tetralix* -** Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage. The vegetation is typically dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, grasses, sedges and *Sphagnum* bog-mosses. **4030 European dry heaths -** European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex* spp., bilberry *Vaccinium* spp. or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors. **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* (* important orchid sites) -** *Festuco-Brometalia* grasslands are found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and Wales, extending locally into upland areas in northern England, Scotland and Northern Ireland. Most of these calcareous grasslands are maintained by grazing. **6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae* -** *Molinia* meadows are found mainly on moist, moderately base-rich, peats and peaty gley soils, often with fluctuating water tables. They usually occur as components of wet pastures or fens, and often form mosaics with dry grassland, heath, mire and scrub communities. This habitat type includes the most species-rich *Molinia* grasslands in the UK, in which purple moor-grass *Molinia caerulea* is accompanied by a wide range of associated species, including rushes, sedges and tall-growing herbs.	

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)
	7210 Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae* - This Annex I type comprises the more species-rich examples of great fen-sedge *Cladium mariscus* fen, particularly those stands enriched with elements of the *Caricion davallianae* (i.e. small-sedge fen with open low-growing sedge vegetation). Davall's sedge *Carex davalliana* itself is extinct in the UK. **91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae* -** Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) comprises woods dominated by alder *Alnus glutinosa* and willow *Salix* spp. on flood plains in a range of situations from islands in river channels to low-lying wetlands alongside the channels. The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation. **1014 Narrow-mouthed whorl snail *Vertigo angustior* -** Norfolk Valley Fens represents narrow-mouthed whorl snail *Vertigo angustior* in East Anglia. At Flordon Common a strong population occurs in flushed grassland with yellow iris *Iris pseudacorus* maintained by light grazing. **1016 Desmoulins whorl snail *Vertigo moulinsiana* -** Norfolk Valley Fens is one of several sites representing Desmoulin's whorl snail *Vertigo moulinsiana* in East Anglia. Within Norfolk Valley Fens there are a number of marginal fens around pingos – pools that formed in hollows left when large blocks of ice melted at the end of the last Ice Age. These are very ancient wetlands and several support strong populations of *V. moulinsiana* as part of a rich assemblage of Red Data Book and Nationally Scarce species in standing water habitat.
Current conservation status (Article 17, JNCC, 2019[124])	**7230 Alkaline fens** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/bad; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; agricultural activities generating diffuse pollution to surface or ground waters; conversion to forest from other land uses or afforestation; abstraction of surface and ground water for resource extraction; mixed source pollution to surface and ground waters; mixed source air pollution, air-borne pollutants; drainage. **4010 Northern Atlantic wet heaths with *Erica tetralix*** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** intensive grazing or overgrazing by livestock; burning for agriculture; conversion to forest from other land uses or afforestation; wind, wave and tidal power; hydropower; management of fishing stocks and games; problematic native species; plant and animal diseases, pathogens and pests; mixed source air pollution, air-borne pollutants. **4030 European dry heaths** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad).

[124] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)
	Overall trend in conservation status: Improving. **Main pressure and threats:** intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; burning for agriculture; suppression of fire for agriculture; conversion to forest from other land uses or afforestation; wind, wave and tidal power; hydropower; management of fishing stocks and games; problematic native species; mixed source air pollution, air-borne pollutants. **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* (* important orchid sites)** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** conversion from one type of agricultural land use to another; abandonment of grassland management; intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; application of synthetic fertilisers on agriculture land; use of plant protection chemical in agriculture; mixed source air pollution, air-borne pollutants; natural succession resulting in species composition change; droughts and decreases in precipitation due to climate change; increases or changes in precipitation due to climate change. **6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae*** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/bad; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** abandonment of grassland management; intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; application of natural fertilisers on agriculture land; agricultural activities generating air pollution; drainage for use as agricultural land; conversion to forest from other land uses or afforestation; mixed source air pollution, air-borne pollutants; droughts and decreases in precipitation due to climate change. **7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/bad; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Improving. **Main pressure and threats:** abandonment of grassland management; agricultural activities generating diffuse pollution to surface or ground waters; mixed source air pollution, air-borne pollutants; abstraction from groundwater, surface water or mixed water; drainage; modification of hydrological flow; sea-level and wave exposure changes due to climate change. **91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior:* Alno-Padion, Alnion incanae, Salicion albae** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** intensive grazing or overgrazing by livestock; modification of hydrological flow or physical alteration of water bodies for agriculture; problematic native species; plant and diseases, pathogens and pests; mixed source air pollution, air-borne pollutants; modification of hydrological flow.

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)
	1014 Narrow-mouthed whorl snail *Vertigo angustior* **Overall assessment of conservation status:** Unfavourable/inadequate (range – unfavourable/inadequate; population – unfavourable/inadequate; habitat for the species: unknown; future prospects – unfavourable/inadequate). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; modification of coastline, estuary and coastal conditions; natural succession resulting in species composition change; flooding; sea-level and wave exposure changes due to climate change. **1016 Desmoulin's whorl snail *Vertigo moulinsiana*** **Overall assessment of conservation status:** Unfavourable/bad (range – unfavourable/bad; population – unfavourable/bad; habitat for the species: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** mowing or cutting of grasslands; agricultural activities generating diffuse pollution to surface or grounds waters; abstraction from groundwater, surface water or mixed water; droughts and decreases in precipitation due to climate change; increases or changes in precipitation due to climate change.
Conservation objectives:	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 qualifying natural habitats and habitats of qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the habitats of qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; The populations of qualifying species; and The distribution of qualifying species within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[125].	Badley Moor SSSI: 100% favourable Booton Common SSSI: 100% unfavourable - recovering Buxton Heath SSSI: 100% unfavourable - recovering Coston Fen, Runhall SSSI: 100% unfavourable – no change East Walton and Adcock's Common SSSI: 100% unfavourable - recovering Flordon Common SSSI: 19.57% favourable, 80.43% unfavourable – recovering Foulden Common SSSI: 24.74% favourable, 61.51% unfavourable – recovering, 13.75% unfavourable - declining Great Cressingham Fen SSSI: 100% unfavourable - recovering Holt Lowes SSSI: 30.07% favourable, 69.93% unfavourable – recovering Potter & Scarning Fens, East Dereham SSSI: 100% unfavourable - recovering Sheringham and Beeston Regis Commons SSSI: 100% unfavourable - recovering

[125] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)	
	Southrepps Common SSSI: 100% unfavourable - recovering Swangey Fen, Attleborough SSSI: 44.44% favourable, 55.56% unfavourable – recovering Thompson Water, Carr and Common SSSI: 73.05% favourable, 22.72% unfavourable – recovering; 4.24% unfavourable – declining	
Site Improvement Plan (SIP)	1) Inappropriate water levels – Pressure: H6410 Purple moor-grass meadows, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water-fed fens – Restore hydrology by fully implementing investigation and Water Level Management Plan findings. 2) Inappropriate scrub control – Pressure: H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites), H6410 Purple moor-grass meadows, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water-fed fens, S1016 Desmoulin`s whorl snail – Preserve open fen through adequately funded scrub control programmes. 3) Hydrological changes – Pressure/Threat: H6410 Purple moor-grass meadows, H7230 Calcium-rich spring water-fed fens, H91E0 Alder woodland on floodplains, S1014 Narrow-mouthed whorl snail – Restore hydrology by fully implementing investigation and Water Level Management Plan findings. 4) Water pollution – Threat: H6410 Purple moor-grass meadows, H7230 Calcium-rich spring water-fed fens – Reduce diffuse water pollution impact through CSF and agri-environment schemes. 5) Inappropriate cutting/mowing – Pressure: H6410 Purple moor-grass meadows, H7230 Calcium-rich spring water-fed fens – Adjust and optimise cutting. 6) Water abstraction – Pressure: H6410 Purple moor-grass meadows, H7230 Calcium-rich spring water-fed fens – Ensure implementation of Review of Consents requirements. 9) Invasive species – Threat: H6410 Purple moor-grass meadows, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water-fed fens, S1016 Desmoulin`s whorl snail – Control and remove all invasive species. 10) Change in land management – Threat: H6410 Purple moor-grass meadows, H7230 Calcium-rich spring water-fed fens – Support on-site management. 11) Changes in species distributions – Threat: H7230 Calcium-rich spring water-fed fens – Understand and halt the decline of characteristic SAC species. 12) Air pollution (impact of atmospheric nitrogen deposition) – Pressure/Threat: H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths, H6210 Dry grasslands and scrublands on chalk or limestone (important orchid sites), H6410 Purple moor-grass meadows, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water fed fens, S1014 Narrow-mouthed whorl snail – Implement a Site Nitrogen Action plan to reduce deposition levels.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Costessey (Heigham WTW)	The proposed drought permit would secure water supply by allowing a temporary increase in the maximum annual licensed abstraction rate from the Costessey groundwater source when flows in the River Wensum are low. The proposed drought permit proposes an increase in the maximum annual abstraction from the Costessey groundwater source from 2000Ml/yr to 4800Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The existing sources are located within an approximate 10km radius of the SAC. The Norfolk Valley Fens SAC covers 616.217ha and comprises a series of valley-head spring-fed fens. The nearest unit of the SAC is located along a tributary of the River Bure. There is no hydrological connectivity between the River Bure and the River Wensum which are two separate catchments. Further units are located over 10km from the Drought Action and there is no hydrological connectivity between these units and the action. **<u>Habitat Features:</u> H7230 Alkaline fens; H4010 Northern Atlantic wet heaths with *Erica tetralix; H*4030 European dry heaths; H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* (* important orchid sites), H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae*, H7210 Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae* and H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae***	**No**

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)	
	Construction: There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: The Buxton Heath SSSIs underpins the SAC and is located with an approximate 10km radius of the existing sources. The main habitats within the Buxton Heath SSSI are fen, marsh and swamp all of which are water-dependant. The habitats designated within the SAC are considered water-dependant and therefore a change in water abstraction may impact the composition and structure of these habitats. However, there is no hydrological connectivity from the borehole to the SAC. Given the distance to the SAC from the borehole and the lack of connectivity to the SAC, no LSE from the Drought Option alone or in-combination with other plans or projects is anticipated during operation of the Drought Option.	
	<u>Species Features:</u> S1014 Narrow-mouthed whorl snail and S1016 Desmoulins whorl snail **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: Within the Norfolk Valley Fens SAC, narrow-mouthed whorl snail is only recorded at Flordon Common SSSI located within an approximate 17km radius of the Costessey source. Within the Norfolk Valley Fens SAC, Desmoulin's whorl snail is only recorded at East Walton Common and Adcock's Common SSSI located within an approximate 45km radius of the sources, outside the ZoI. As no narrow-mouthed whorl snail nor Desmoulin's whorl snail population have been identified within the ZoI, no LSE are anticipated during operation of the Drought Option. Therefore, no LSE, from the Drought Option alone, or in-combination with other plans or projects is anticipated upon the qualifying species, from construction and operation.	**No**
Wellington Wellfield (Stoke Ferry & Marham WTW)	The proposed drought permit is to increase the daily licenced abstraction of the Wellington Wellfield and Denton Lodge groundwater source by a maximum of 2.726 Ml/d to 25 Ml/d total output for six months. The extra 2.736 Ml/d will likely come from a combination of the Wellington Wellfield and Denton Lodge sources. To allow this extra abstraction the annual licence would be increased by 2,747.5 Ml, from 3,655 Ml/yr to 6,402.5 Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The groundwater ZoI for this drought permit has been defined as approximately 13km from the Wellington Wellfield boreholes, only including areas where groundwater drawdowns in relevant hydrogeological 'layers' is more than 0.01m greater in the drought permit scenario compared to the fully licenced baseline scenario. The Norfolk Valley Fens SAC covers 616.217ha and comprises a series of valley-head spring-fed fens. The nearest unit of the SAC is located within an approximate 8km radius of the existing sources, underpinned by Foulden Common SSSI and within the ZoI. Further units are located over 10km from the Drought Action and outside the ZoI. Modelling has shown that baseline groundwater level depths range between 1.69 - 24.5m (summer) and 0.98 - 23.3m (winter) (see Section 4.3.1 in DP27 Wellington Wellfield EAR). The minimum groundwater levels may decrease by 0.26m in summer and 0.22m in winter. Impacts during the summer can be screened out as the groundwater is not high enough where abstraction will cause Groundwater Dependent Terrestrial Ecosystem's (GWDTE's) conditions to decrease, therefore, impacts in summer are negligible. **<u>Habitat Features:</u> H7230 Alkaline fens; H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae*, H7210 Calcareous fens with *Cladium mariscus* and species of the *Caracion davallianae* and H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae*** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: The Foulden Common SSSI underpinning the SAC is located within the ZoI. Alkaline fens, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (M24 - *Molinia caerulea - Cirsium dissectum* fen meadow), calcareous fens (S2 - *Cladium*	**Yes**

Habitats Site name:	Norfolk Valley Fens SAC (UK0012892)	
	mariscus swamp and sedge-beds, S25 - *Phragmites australis - Eupatorium cannabinum* tall-herb fen, M13 - *Schoenus nigricans - Juncus subnodulosus* mire, and M24 - *Molinia caerulea - Cirsium dissectum* fen meadow) and alluvial forests (W5 - *Alnus glutinosa - Carex paniculata* woodland) have been identified within the Foulden Common SSSI. These habitats are considered water-dependant and therefore a change in water abstraction may impact the composition and structure of these habitats. LSE cannot be ruled out at this stage during operation of the Drought Permit.	
	Habitat Features: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: The Foulden Common SSSI underpinning the SAC is located within the ZoI. Semi-natural dry grasslands and scrubland facies on calcareous substrates (CG2 - *Festuca ovina - Avenula pratensis* lowland calcareous grassland and CG6 - Dry grassland/ scrub transitions) have been identified within the SSSI. However, this habitat is not considered water-dependant. Therefore, no LSE nor residual effects are anticipated during operation of the Drought Permit. Therefore, no LSE, from the Drought Permit alone, is anticipated upon the qualifying habitat, from construction and operation.	**No**
	Habitat Features: H4010 Northern Atlantic wet heaths with *Erica tetralix; H*4030 European dry heaths **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: Within the Norfolk Valley Fens SAC, these habitat features have not been identified within the Foulden Common SSSI underpinning the SAC and the only unit of the SAC located within the ZoI. As those habitats have not been identified within the ZoI, no LSE are anticipated during operation of the Drought Permit. Therefore, no LSE nor residual effects, from the Drought Permit alone, is anticipated upon the qualifying habitats, from construction and operation.	**No**
	Species Features: S1014 Narrow-mouthed whorl snail and S1016 Desmoulins whorl snail **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Norfolk Valley Fens SAC. **Operation**: Within the Norfolk Valley Fens SAC, narrow-mouthed whorl snail is only recorded at Flordon Common SSSI, over 40km from the Wellington Wellfield and Denton Lodge sources. Within the Norfolk Valley Fens SAC, Desmoulin's whorl snail is only recorded at East Walton Common / Adcock's Common SSSI and Thompson Common SSSI, respectively within an approximate 25km and 15km radius of the sources, outside the ZoI. As no narrow-mouthed whorl snail nor Desmoulin's whorl snail population have been identified within the ZoI, no LSE nor residual effects are anticipated during operation of the Drought Permit. Therefore, no LSE, from the Drought Permit alone, is anticipated upon the qualifying species, from construction and operation.	**No**

Table AN- 8: Stage 1 Screening of Orton Pit SAC

Habitats Site name:	Orton Pit SAC (UK0030053)	
Designation type and location	SAC, TL16169420	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.* -** Orton Pit's extensive pond system, occupying the disused ridge-and-furrow created as a result of clay extraction for the brick-making industry, contains alkaline water low in nutrients. The site supports a total of ten species of charophyte including the main English population of bearded stonewort *Chara canescens. C. canescens* is an early coloniser of ponds at the site and is rarely found in ponds over 20 years old. It favours brackish conditions, which at Orton Pit are thought to be provided by the release of salts out of the top few millimetres of the clay that becomes oxidised over a period of time. Other nationally scarce stonewort species present include *Chara aspera, C. contraria, C. pedunculata* and *Tolypella glomerata.* The distribution of Chara species across the site varies according to the age and stage of succession of the ponds, with few being found in ponds greater than 25 years old. **1166 Great crested newt *Triturus cristatus* -** Orton Pit in the East Midlands contains the largest known population of great crested newt *Triturus cristatus* in the UK and possibly in Europe. The extensive pond systems occupy disused ridge and furrow areas created by clay workings, at various successional stages. Management of water levels and predatory fish is essential for the maintenance of the newt population. New ponds are created in ways that allow water control, and measures are taken to encourage rapid colonisation by newts in order to maintain the population. The range of habitats found throughout the site, including surrounding areas of grassland and scrub, provide good conditions for feeding and sheltering newts.	
Current conservation status (Article 17, JNCC, 2019[126])	**3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Management of fishing stocks and game, Invasive alien species of Union concern, Other invasive alien species (other then species of Union concern), Mixed source pollution to surface and ground waters (limnic and terrestrial), Modification of hydrological flow, Temperature changes (e.g. rise of temperature & extremes) due to climate change, Agricultural activities generating point source pollution to surface or ground waters, Agricultural activities generating diffuse pollution to surface or ground waters, Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water, Management of fishing stocks and game, Invasive alien species of Union concern, Other invasive alien species (other then species of Union concern), Mixed source pollution to surface and ground waters (limnic and terrestrial), Modification of hydrological flow, Temperature changes (e.g. rise of temperature & extremes) due to climate change. **1166 Great crested newt *Triturus cristatus*** **Overall assessment of conservation status:** Unfavourable/inadequate (range – favourable; population – unfavourable - inadequate; habitat for the species: unfavourable - inadequate; future prospects – unfavourable - inadequate).	

[126] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	Orton Pit SAC (UK0030053)	
	Overall trend in conservation status: Deteriorating. **Main pressure and threats:** Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, sp rings, solitary trees, etc.), Agricultural activities generating point source pollution to surface or ground waters, Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels), Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions), Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estua ry and coastal conditions), Mixed source pollution to surface and ground waters (limnic and terrestrial), Modification of hydrological flow, Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices). Change of habitat location, size, and / or quality due to climate change, Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), Agricultural activities generating point source pollution to surface or ground waters, Roads, paths, railroads and related in frastructure (e.g. bridges, viaducts, tunnels), Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification o f coastline, estuary and coastal conditions), Conversion from other land uses to commercial / industrial areas (excluding drainage and modification of coastline, estuary and coastal conditions), Mixed source pollution to surface and ground waters (limnic and terrestrial), Modification of hydrological flow, Natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices), Interspecific relations (competition, predation, parasitism, pathogens), Change of habitat location, size, and / or quality due to climate change.	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; The extent and distribution of qualifying natural habitats and habitats of qualifying species The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of qualifying species The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of qualifying species, and, The distribution of qualifying species within the site	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[127].	Orton Pit SSSI: 28.65% favourable, 71.35% unfavourable - recovering	
Site Improvement Plan (SIP)	1 Predation – Threat: S1166 Great crested newt – Fish predation and GCN larvae survival study. 2 Inappropriate scrub control – Threat: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, S1166 Great crested newt - Increase scrub management effort through CES. 3 Inappropriate weed control - Threat: H3140 Calcium-rich nutrient-poor lakes, lochs and pools - Increase weed control effort through CES. 4 Direct impact from 3rd party – Threat: S1166 Great crested newt - Improve partnership working to manage incidences and improve education and awareness. 5 Disease – threat: S1166 Great crested newt - Monitor signs of disease to GCNs and implement future strategy.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**

[127] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Orton Pit SAC (UK0030053)	
River Nene (Rutland)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling of Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr) would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF from 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. Orton Pit SAC is within an approximate 10km radius of the abstraction point and is hydrologically connected to the River Nene via Stanground Lode. This has been assessed as a major hydrological impact during summer and winter months. Potential impact pathways include reduced flow rates in the River Nene, reduced groundwater refilling rates, water quality deterioration and increased siltation. This could have an impact on all water dependant qualifying habitats in the SAC. **Habitat feature: 3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** Orton Pit SAC is not hydrologically connected to the River Nene and the hydrology of the SAC is based on groundwater and rainwater. Water levels across the SAC are maintained by a permanent automated pump. Operation of the drought permit is not considered to result in expected changes to the baseline groundwater conditions. No impact pathways have been identified between the drought option and the SAC and therefore, no LSEs are anticipated as a result of the operation of the drought permit.	**Yes**
	Species feature: 1166 Great crested newt *Triturus cristatus* **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated. **Operation:** Orton Pit SAC is not hydrologically connected to the River Nene and the hydrology of the SAC is based on groundwater and rainwater. Water levels across the SAC are maintained by a permanent automated pump. Operation of the drought permit is not considered to result in expected changes to the baseline groundwater conditions. No impact pathways have been identified between the drought option and the SAC and therefore, no LSEs are anticipated as a result of the operation of the drought permit.	**Yes**

Table AN- 9: Stage 1 Screening of Ouse Washes SAC

Habitat site name:	Ouse Washes SAC (UK0013011)	
Designation type and location	SAC, TL480872	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**S1149 Spined loach, *Cobitis taenia* -** 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, with their associated waterways. The fish has limited means of dispersal so UK populations are largely genetically isolated from each other. The Ouse Washes SAC represents spined loach populations within the River Ouse catchment. The Counter Drain, with its clear water and abundant macrophytes, is a particularly important part of the site where a healthy population of spined loach is known to occur.	
Curent conservation	**S6963 Spined loach *Cobitis taenia***	

Habitat site name:	Ouse Washes SAC (UK0013011)	
status (JNCC, 2019, Article 17[128] and Article 12[129])	**Overall assessment of conservation status:** Favourable (range: favourable, population: unknown, habitat for the species: favourable, future prospects: favourable). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Physical alteration of water bodies, Modification of hydrological flow, Mixed source pollution to surface and ground waters (limnic and terrestrial)	
Conservation objectives:	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, and, The distribution of qualifying species within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[130].	Ouse washes SSSI: 15.73% favourable, 84.27% unfavourable – no change.	
Site Improvement Plan (SIP)	1 Inappropriate water Pressure levels: A050(NB) Wigeon, A056(B) Shoveler, A119(B) Spotted Crake, A151(B) Ruff, A156a(B) Black-tailed Godwit - Habitat creation to offset historical decline of wintering and breeding birds and other strategies to alleviate flooding. 2 Water Pollution: A037(NB) Bewick's Swan, A038(NB) Whooper Swan, A050(NB) Wigeon, A051(B) Gadwall, A051(NB) Gadwall, A052(NB) Eurasian teal, A053(B) Mallard, A054(NB) Pintail, A055(B) Garganey, A056(B) Shoveler, A056(NB) Shoveler, A059(NB) Common pochard, A082(NB) Hen Harrier, A119(B) Spotted Crake, A151(B) Ruff, A151(NB) Ruff, A156a(B) Blacktailed Godwit, A156a(NB) Black-tailed Godwit, Breeding bird assemblage, S1149 Spined loach, Waterbird assemblage - Implementation of Diffuse Water Pollution plan to tackle inappropriate levels of nutrients from flooding.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Gt Ouse (Grafham water)	Under the proposed drought permit conditions, 2 stages of abstraction are permitted: Stage 1 - abstraction at up to 100% of the flow in excess of the MRF, stage 2 - 50% reduction MRF to 68 Ml/d, abstraction at up to 75% of the flow excess of the MRF. The Offord intake is within an approximate 20km radius of the Ouse Washes SAC and approximately within 30km via hydrological connectivity. **Species feature: S6963 - Spined loach *Cobitis taenia*** **Construction** There is no construction phase associated with this drought action. **Operation**	**Yes**

[128] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[129] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[130] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Ouse Washes SAC (UK0013011)	
	immediately downstream of the intake along the River Great Ouse. The SAC is located within Reach 2. Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Water flow assessment has concluded that impacts are anticipated to be moderate to minor within Reach 2. Water quality assessments have also determined that major impacts are anticipated on orthophosphate concentrations in Reach 1 and 2 (Bedford Ouse at Brownshill Staunch to Salters Lode, 35km, SSSI unit 22) during Stage 2 of the drought permit in summer. Extended periods of low flow and fluctuations in abiotic conditions could also cause increased algal growth, potentially impacting on the extent of supporting habitat. Therefore, LSEs cannot be ruled out at this stage.	

Table AN- 10: Stage 1 Screening of Portholme SAC

Habitat site name:	Portholme SAC (UK0030054)	
Designation type and location	SAC, TL23837081	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**H6510 Lowland hay meadows *Alopecurus pratensis, Sanguisorba officinalis* -** This large site represents lowland hay meadows in eastern England. It is the largest surviving traditionally-managed meadow in the UK, with an area of 104 ha of alluvial flood meadow (7% of the total UK resource). There has been a long history of favourable management and very little of the site has suffered from agricultural improvement, and so it demonstrates good conservation of structure and function. It supports a small population of fritillary *Fritillaria meleagris*.	
Current conservation status (JNCC, 2019, Article 17[131] and Article 12[132])	**H6510 Lowland hay meadows *Alopecurus pratensis, Sanguisorba officinalis*** **Overall assessment of conservation status:** Unfavourable - bad (range: favourable, area: unfavourable - inadequate, structure and function: unfavourable - bad, future prospects: unfavourable - bad). **Overall trend in conservation status:** deteriorating. **Main pressure and threats:** Conversion into agricultural land (excluding drainage and burning) (A01), Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Extensive grazing or undergrazing by livestock (A10), Application of synthetic (mineral) fertilisers on agricultural land (A20), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Mixed source air pollution, air-borne pollutants (J03), Droughts and decreases in precipitation due to climate change (N02), Increases or changes in precipitation due to climate change (N03), Conversion into agricultural land (excluding drainage and burning) (A01) Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06), Extensive grazing or undergrazing by livestock (A10), Application of synthetic (mineral) fertilisers on agricultural land (A20), Agricultural activities generating diffuse pollution to surface or ground waters (A26), Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Mixed source pollution to surface and ground waters (limnic and terrestrial) (J01), Mixed source air pollution, air-borne pollutants (J03), Droughts and decreases in precipitation due to climate change (N02), Increases or changes in precipitation due to climate change (N03)	
Conservation objectives:	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;	

[131] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[132] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitat site name:	Portholme SAC (UK0030054)	
	The extent and distribution of qualifying natural habitats The structure and function (including typical species) of qualifying natural habitats, and The supporting processes on which qualifying natural habitats rely	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[133].	Portholme SSSI: 100.00% unfavourable – recovering	
Site Improvement Plan (SIP)	1 Inappropriate water levels - threat: H6510 Lowland hay meadows - Review the Water Level Management Plan (WLMP) and monitor flooding 2 Water Pollution - threat: H6510 Lowland hay meadows - Review the Diffuse Water Pollution Plan and monitor phosphate / sediment levels	
Potential Effects		
Component	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Gt Ouse (Grafham Water)	This large site represents lowland hay meadows in eastern England. It is the largest surviving traditionally managed meadow in the UK, with an area of 104 ha of alluvial flood meadow (7% of the total UK resource). There has been a long history of favourable management and very little of the site has suffered from agricultural improvement, and so it demonstrates good conservation of structure and function. It supports a small population of fritillary *Fritillaria meleagris*. Seasonal flooding maintains an input of nutrients. Under the proposed drought permit conditions, 2 stages of abstraction are permitted: Stage 1 - abstraction at up to 100% of the flow in excess of the MRF, stage 2 - 50% reduction MRF to 68 Ml/d, abstraction at up to 75% of the flow excess of the MRF. The Portholme SAC is within an approximate 7km radius of the River Gt Ouse Drought Permit. **Habitat feature: H6510 Lowland hay meadows *Alopecurus pratensis, Sanguisorba officinalis*** **Construction** There is no construction phase associated with this drought action. **Operation** There is no construction phase associated with this Drought Option, and therefore no LSE are anticipated upon the Portholme SAC. Operation: Lowland hay meadows are considered water dependant. A 50% reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Portholme Sac is located alongside Reach 1. Hydrological impact assessment has concluded that impacts to water flows will be minor during Stage 1 implementation, moderate (in winter) to major (in summer) during Stage 2 implementation. However, the water levels within the SAC are controlled and maintained by the Godmanchester lock adjacent to the site. Furthermore, fluctuations in abiotic parameters including pH, temperature, suspended sediment and nutrient concentrations may occur due to a reduction in the dilution capacity. Modelling has concluded that impacts to water quality are major to moderate. However, as the identified impact pathways are limited to periods of low flow when hydrological connectivity between the River Great Ouse and the SAC is negligible. Therefore, no LSEs upon the SAC are anticipated.	**No**

[133] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Table AN- 11: Stage 1 Screening of River Wensum SAC

Habitats Site name:	**River Wensum SAC (UK0012647)**	
Designation type and location	SAC, TG022176	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation =** The Wensum represents sub-type 1 in lowland eastern England. Although the river is extensively regulated by weirs, *Ranunculus* vegetation occurs sporadically throughout much of the river's length. Stream water-crowfoot *R. penicillatus* ssp. *pseudofluitans* is the dominant *Ranunculus* species but thread-leaved water-crowfoot *R. trichophyllus* and fan-leaved water-crowfoot *R. circinatus* also occur. **S1092 White-clawed crayfish *Austropotamobius pallipes* -** The Wensum is a chalk-fed river in eastern England, and is an eastern example of riverine white-clawed crayfish *Austropotamobius pallipes* populations. As with most of the remaining crayfish populations in the south and east of England, the threats from non-native crayfish species and crayfish plague are severe. Designation of the river as a SAC provides as much protection as can be afforded to such vulnerable populations. **S1016 Desmoulins whorl snail *Vertigo moulinsiana* -** Desmoulin's whorl snail *Vertigo moulinsiana* is the largest *Vertigo* species, with a shell height up to about 2.6 mm. It is restricted to calcareous wetlands, usually bordering lakes or rivers, or in fens. High humidity appears to be important in determining local distribution within sites. It normally lives on reed-grasses and sedges, such as reed sweet-grass *Glyceria maxima* and tussocks of greater pond-sedge *Carex riparia* and lesser pond-sedge *C. acutiformis*, where it feeds on the microflora, and in autumn it may ascend taller reeds and scrub. Like all Annex II *Vertigo* species, it is highly dependent on maintenance of existing local hydrological conditions. **S1096 Brook lamprey *Lampetra planeri* -** The brook lamprey *Lampetra planeri* is a primitive, jawless fish resembling an eel, and is the smallest of the lampreys found in the UK. It is a non-migratory freshwater species, occurring in streams and occasionally in lakes in north-west Europe. Like other lamprey species, the brook lamprey requires clean gravel beds for spawning and soft marginal silt or sand for the ammocoete larvae. It spawns mostly in parts of the river where the current is not too strong. **S1163 Bullhead *Cottus gobio* -** The bullhead *Cottus gobio* is a small bottom-living fish that inhabits a variety of rivers, streams and stony lakes. It appears to favour fast-flowing, clear shallow water with a hard substrate (gravel/cobble/pebble) and is frequently found in the headwaters of upland streams. However, it also occurs in lowland situations on softer substrates so long as the water is well-oxygenated and there is sufficient cover. It is not found in badly polluted rivers.	
Current conservation status (Article 17, JNCC, 2019[134]):	**3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation** **Overall assessment of conservation status:** Unfavourable - bad (range – favourable; area – unfavourable/inadequate, structure and function – unfavourable/bad, future prospects – unfavourable/bad). **Overall trend in conservation status:** Improving.	

[134] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	River Wensum SAC (UK0012647)
	Main pressure and threats: forestry activities generating pollution to surface or ground waters; hydropower; invasive alien species; mixed source pollution to surface and ground waters; modification of hydrological flow; physical alteration of water bodies; temperature changes due to climate change; drought and decrease in precipitation due to climate change; increases or changes in precipitation due to climate change. **1092 White-clawed crayfish *Austropotamobius pallipes*** **Overall assessment of conservation status:** Unfavourable - bad (range – unfavourable/bad; population – unfavourable/bad; habitat for the species: favourable; future prospects – unfavourable/bad). **Overall trend in conservation status:** deteriorating. **Main pressure and threats:** freshwater fish and shellfish harvesting; introduction and spread of species in freshwater aquaculture; invasive alien species; drainage; modification of hydrological flow; physical alteration of water bodies; interspecific relations; change of habitat location/size/quality due to climate change. **1016 Desmoulin's whorl snail *Vertigo moulinsiana*** **Overall assessment of conservation status:** Unfavourable - bad (range – unfavourable/bad; population – unfavourable/bad; habitat for the species: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** deteriorating. **Main pressure and threats:** mowing or cutting of grasslands; agricultural activities generating diffuse pollution to surface or grounds waters; abstraction from groundwater, surface water or mixed water; droughts and decreases in precipitation due to climate change; increases or changes in precipitation due to climate change. **1096 Brook lamprey *Lampetra planeri*** **Overall assessment of conservation status:** Unknown (range – favourable; population – unknown; habitat for the species – unknown; future prospects – unknown). **Overall trend in conservation status:** Unknown. **Main pressure and threats:** point source and diffuse pollution generated by agricultural activities; hydropower; mixed source pollution to surface and ground waters; modification of hydrological flow; physical alteration of water bodies; droughts and decrease in precipitation due to climate change; change of habitat location/size/quality due to climate change; invasive alien species. **1163 Bullhead *Cottus gobio*** **Overall assessment of conservation status:** Favourable (range – favourable; population – favourable; habitat for the species – unknown; future prospects – favourable). **Overall trend in conservation status:** Stable. **Main pressure and threats:** physical alteration of water bodies; climate related changes in abiotic conditions; hydropower; freshwater fish and shellfish harvesting; problematic native species; invasive species; mixed source pollution to surface and ground waters; modification of hydrological flow.

Habitats Site name:	River Wensum SAC (UK0012647)	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the habitats of qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; The populations of qualifying species; and The distribution of qualifying species within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[135].	River Wensum SSSI: 11.05% favourable; 44.68% unfavourable – recovering; 44.27% unfavourable – no change.	
Site Improvement Plan (SIP)	1) Physical modification – Pressure: H3260 Rivers with floating vegetation often dominated by water-crowfoot, S1092 White-clawed (or Atlantic stream) crayfish, S1096 Brook lamprey, S1163 Bullhead – Restore appropriate channel morphology. 2) Inappropriate weirs, dams and other structures – Pressure: H3260 Rivers with floating vegetation often dominated by water-crowfoot – Remove structures. 3) Siltation – Pressure: H3260 Rivers with floating vegetation often dominated by water-crowfoot, S1092 White-clawed (or Atlantic stream) crayfish, S1096 Brook lamprey, S1163 Bullhead – Implement the Diffuse Water Pollution Plant. 4) Invasive species – Pressures: H3260 Rivers with floating vegetation often dominated by water-crowfoot, S1016 Desmoulin`s whorl snail, S1092 White-clawed (or Atlantic stream) crayfish, S1096 Brook lamprey, S1163 Bullhead – Control signal crayfish populations and monitor white-clawed crayfish. 5) Water pollution – Pressure: H3260 Rivers with floating vegetation often dominated by water-crowfoot, S1016 Desmoulin`s whorl snail, S1092 White-clawed (or Atlantic stream) crayfish, S1096 Brook lamprey, S1163 Bullhead – Implement schemes to address pollution. 6) Water abstraction – Pressure: H3260 Rivers with floating vegetation often dominated by water-crowfoot, S1016 Desmoulin`s whorl snail, S1092 White-clawed (or Atlantic stream) crayfish, S1096 Brook lamprey, S1163 Bullhead – Implement measures identified in the Restoring Sustainable Abstraction Programme.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Costessey (Heigham WTW)	The proposed drought permit would allow a temporary increase in the maximum annual licensed abstraction rate from the Costessey boreholes when flows in the River Wensum are low. The proposed drought permit proposes an increase in the maximum annual abstraction from the Costessey groundwater source from 2000Ml/yr to 4800Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The existing groundwater source is located approximately 120m west of the SAC. Potential impact pathways include reduced flow rates in the River Wensum, reduced groundwater refilling rates, water quality deterioration and increased siltation. **Habitat Feature: H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation**	**Yes**

[135] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	River Wensum SAC (UK0012647)	
	Construction: There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the River Wensum SAC. **Operation:** The River Wensum SAC and SSSI are located within the ZoI. *Ranunculion fluitantis* and *Callitricho-Batrachion* are aquatic plants that float in mat formations on the river surface. The SAC is sensitive to activities that may affect water levels and flow in the catchment. As the habitat is considered water-dependant, a change in water abstraction may impact the composition and structure of this habitat. Therefore, LSE cannot be ruled out at this stage during operation of the Drought Permit alone or in-combination with other plans or projects.	
	Species Feature: S1096 Brook lamprey, S1163 Bullhead, S1092 White-clawed crayfish, and S1016 Desmoulins whorl snail **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the River Wensum SAC. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Additionally, the SAC is located within the ZoI. Therefore, LSE cannot be ruled out at this stage during operation of the Drought Permit alone or in-combination with other plans or projects.	**Yes**

Table AN- 12: Stage 1 Screening of The Broads SAC

Habitats Site name:	The Broads SAC (UK0013577)	
Designation type and location	SAC, TG438209	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. -** The Broads is the richest area for charophytes in Britain (Stewart 1996). Twenty species have been recorded, which represents over 65% of the British flora. The core of this interest is the Thurne Broads and particularly Hickling Broad which is the richest site in the UK. Sixteen species have been recorded within Hickling Broad, a large shallow brackish lake. Within the Broads examples of *Chara* vegetation are also found within fen pools (turf ponds) and fen and marsh ditch systems. The Broads supports a number of rare and local charophyte species, including *Chara aspera*, *C. baltica*, *C. connivens*, *C. contraria*, *C. curta*, *C. intermedia*, *C. pedunculata*, *Nitella mucronata*, *Nitellopsis obtusa*, *Tolypella glomerata* and *T. intricata*. **3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation -** The Broads in East Anglia contain several examples of southern natural eutrophic lakes. Although artificial, having arisen from peat digging in medieval times, these lakes and the ditches in areas of fen and drained marshlands support relict vegetation of the original Fenland flora, and collectively this site contains one of the richest assemblages of rare and local aquatic species in the UK. The stonewort – pondweed – water-milfoil – water-lily *Characeae – Potamogeton – Myriophyllum – Nuphar* associations are well-represented, as are club-rush – common reed *Scirpo – Phragmitetum* associations. Some Broads, such as Martham North, Martham South and Upton Broad, have escaped the problem of enrichment that has so affected the flora and fauna on many of the other Broads. Others, such as Hickling Broad, are recovering from these effects as a result	

Habitats Site name:	The Broads SAC (UK0013577)
	of remedial measures. Martham North, Martham South, Upton and Hickling Broad contain holly-leaved naiad *Najas marina*, a national rarity. The dyke (ditch) systems support vegetation characterised by water-soldier *Stratiotes aloides*, whorled water-milfoil *Myriophyllum verticillatum* and broad-leaved pondweed *Potamogeton natans*. **7140 Transition mires and quaking bogs -** The Broads contain examples of transition mire in a flood plain in the south-eastern part of the UK, where the habitat is rare. The areas of transition mire, mainly of M5 *Carex rostrata – Sphagnum squarrosum* mire, M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire and S27 *Carex rostrata – Potentilla palustris* tall-herb fen, are relatively small, having developed in re-vegetated peat-cuttings as part of a complex habitat mosaic of fen, carr and open water**.** **7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* -** This flood plain mire site in East Anglia has the largest example of calcareous fens in the UK and possibly the largest occurrence in the EU outside Sweden. The *Cladium* habitat occurs in a diverse set of conditions that maintain its species-richness, including managed *Cladium* fen, contacts between *Cladium* beds and small sedge mires, and situations where *Cladium* occurs at the limits of its ecological range. The habitat type forms large-scale mosaics with other fen types, open water and woodland, and important associated Annex II plant species. **1903 Fen orchid *Liparis loeselii*** - (found at Upton Fen), marsh helleborine *Epipactis palustris*, lesser tussock-sedge *Carex diandra*, slender sedge *C. lasiocarpa* and fibrous tussock-sedge *C. appropinquata*. **7230 Alkaline fens -** The Broads is one of two sites selected for Alkaline fens in East Anglia, in eastern England, where a main concentration of lowland fen occurs. There are areas of short sedge fen (both M13 *Schoenus nigricans – Juncus subnodulosus* mire and M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire), which in places form a mosaic with S24 *Phragmites aus*tralis – *Peucedanum palustris* fen. There are complex zonations present and many differences exist between the individual fens that comprise the site. The fens are principally of the flood plain mire type. The site contains a range of rare and local plant species, including the Annex II 1903 Fen orchid *Liparis loeselii*, lesser tussock-sedge *Carex diandra* and slender sedge *C. lasiocarpa*. **91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae* *Priority feature -** The complex of sites in the Broads of East Anglia contains the largest blocks of alder *Alnus glutinosa* wood in England. Within the complex complete successional sequences occur from open water through reed swamp to alder woodland, which has developed on fen peat. There is a correspondingly wide range of flora, including a number of uncommon species such as marsh fern *Thelypteris palustris*. **6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae* -** *Molinia* meadows are found mainly on moist, moderately base-rich, peats and peaty gley soils, often with fluctuating water tables. They usually occur as components of wet pastures or fens, and often form mosaics with dry grassland, heath, mire and scrub communities. This habitat type includes the most species-rich *Molinia* grasslands in the UK, in which purple moor-grass *Molinia caerulea* is accompanied by a wide range of associated species, including rushes, sedges and tall-growing herbs. **1016 Desmoulin's whorl snail *Vertigo moulinsiana* -** The Broads is the main stronghold of Desmoulin's whorl snail *Vertigo moulinsiana* in East Anglia and is one of several sites selected in this part of its range. Several large populations are known, associated with standing and flowing water and ditch systems. This is a very important area for its wetland invertebrate fauna, and many Red Data Book and Nationally Scarce species occur here.

Habitats Site name:	The Broads SAC (UK0013577)
	1903 Fen orchid *Liparis loeselii* - The Broads in eastern England provide representation of the Fenland form of fen orchid *Liparis loeselii* in the eastern part of its UK range. Three small populations of *var. loeselii* are known to occur on this site, and 242 plants were found in 1996. **4056 Ramshorn snail *Aniscus vorticulus* -** *Anisus vorticulus* occurs across a range of sites in southern and eastern England. The Broads is one of the three main population centres for this species in the UK. **1355 Otter *Lutra lutra* -** Annex II species present as a qualifying feature but not a primary reason for site selection.
Current conservation status (Article 17, JNCC, 2019[136])	**3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.** **Overall assessment of conservation status:** Unfavourable - bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** agricultural activities generating point source or diffuse pollution to surface or ground waters; discharge or urban wastewater generating pollution to surface or ground water; management of fishing stocks and game; invasive alien species of Union concern; other invasive alien species; mixed source of pollution to surface and ground waters; modification of hydrological flow; temperature changes due to climate change. **3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation** **Overall assessment of conservation status:** Unfavourable - bad (range – favourable; area – favourable; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** deteriorating. **Main pressure and threats:** intensive grazing or overgrazing by livestock, agricultural activities generating point source or diffuse pollution to surface or ground waters; discharge or urban wastewater generating pollution to surface or ground water; management of fishing stocks and game; invasive alien species of Union concern; other invasive alien species; modification of hydrological flow; sports, tourism and leisure activities. **7140 Transition mires and quaking bogs** **Overall assessment of conservation status:** Unfavourable - bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad;). **Overall trend in conservation status:** Stable. **Main pressure and threats:** intensive grazing or overgrazing by livestock; extensive grazing or undergrazing by livestock; modification of hydrological conditions or physical alteration of water bodies and drainage for forestry; problematic native species; mixed source pollution to surface and ground waters; mixed source air pollution, air-borne pollutants; drainage; increases or changes in precipitation due to climate change. **7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** – as detailed for Norfolk Valley Fens SAC. **7230 Alkaline fens** – as detailed for Norfolk Valley Fens SAC.

[136] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/

Habitats Site name:	The Broads SAC (UK0013577)
	91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*: Alno-Padion, Alnion incanae, Salicion albae – as detailed for Norfolk Valley Fens SAC. **6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae*** – as detailed for Norfolk Valley Fens SAC. **1016 Desmoulin's whorl snail *Vertigo moulinsiana*** – as detailed for River Wensum SAC. **1903 Fen orchid *Liparis loeselii*** **Overall assessment of conservation status:** Unfavourable - bad (range – unfavourable/bad; population – unfavourable/bad; habitat for the species: unfavourable/inadequate; future prospects – unfavourable/inadequate). **Overall trend in conservation status:** Improving. **Main pressure and threats:** abandonment of grassland management; extensive grazing or undergrazing by livestock; agricultural activities generating air pollution; other invasive alien species; problematic native species; mixed source air pollution, air-borne pollutants; abstraction from groundwater, surface water or mixed water; natural succession resulting in species composition change. **4056 Ramshorn snail *Aniscus vorticulus*** **Overall assessment of conservation status:** Unfavourable/inadequate (range – favourable; population – unfavourable/inadequate; habitat for the species: favourable; future prospects – unfavourable/inadequate). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** extensive grazing or undergrazing by livestock; modification of hydrological flow or physical alteration of water bodies for agriculture; invasive alien species of Union concern; other invasive alien species; natural succession resulting in species composition change. **1355 Otter *Lutra lutra*** **Overall assessment of conservation status:** Favourable (range – favourable; population – favourable; habitat for the species: favourable; future prospects – favourable). **Overall trend in conservation status:** Stable. **Main pressure and threats:** modification of hydrological flow or physical alteration of water bodies for agriculture; roads, paths, railroads and related infrastructure; illegal shooting/killing; bycatch and incidental killing; mixed source pollution to surface and ground waters; mixed source marine water pollution; use of plant protection chemical in agriculture.
Conservation objectives:	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 qualifying natural habitats and habitats of qualifying species; The structure and function (including typical species) of qualifying natural habitats; The structure and function of the habitats of qualifying species; The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; The populations of qualifying species; and

Habitats Site name:	The Broads SAC (UK0013577)
	The distribution of qualifying species within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[137].	Alderfen Broad SSSI: 8.65% favourable; 91.35% unfavourable – recovering. Ant Broads and Marshes SSSI: 49.90% favourable; 42,81% unfavourable – recovering; 7.29% unfavourable – declining. Barnby Broad & Marshes SSSI: 59.93% favourable; 40,07% unfavourable – recovering. Broad Fen, Dilham SSSI: 100% unfavourable – recovering. Bure Broads and Marshes SSSI: 43.08% favourable; 46.85% unfavourable – recovering; 10.07% unfavourable – no change. Burgh Common and Muckfleet Marshes SSSI: 27% favourable; 69.57% unfavourable – recovering; 3.43% unfavourable – no change. Calthorpe Broad SSSI: 97.68% favourable; 2.32% unfavourable – recovering. Cantley Marshes SSSI: 100% favourable. Crostwick Marsh SSSI: 100% unfavourable – no change. Damgate Marshes, Acle SSSI: 74.73% favourable; 25.27% unfavourable – recovering. Decoy Carr, Acle SSSI: 70.21% favourable; 29.79% unfavourable – recovering. Ducan's Marsh, Claxton SSSI: 100% unfavourable – recovering. Geldeston Meadows SSSI: 97.18% unfavourable – no change; 2.82% unfavourable – declining. Hall Farm Fen, Hemsby SSSI: 100% favourable. Halvergate Marshes SSSI: 72.75% favourable; 9.02% unfavourable – recovering; 18.23% unfavourable – no change. Hardley Flood SSSI: 100% favourable. Limpenhoe Meadows SSSI: 100% unfavourable – recovering. Ludham - Potter Heigham Marshes SSSI: 100% favourable. Poplar Farm Meadows, Langley SSSI: 100% favourable. Priory Meadows, Hickling SSSI: 29.79% favourable; 70.21% unfavourable – recovering. Shallam Dyke Marshes, Thurne SSSI: 4.44% favourable; 95.56% unfavourable – no change. Smallburgh Fen SSSI: 100% favourable. Sprat's Water and Marshes, Carlton Colville SSSI: 80.48% favourable; 19.19% unfavourable – recovering; 0.33% unfavourable – no change. Stanley and Alder Carrs, Aldeby SSSI: 100% unfavourable – recovering. Trinity Broads SSSI: 45.48% favourable; 41.98% unfavourable – recovering; 12.54% unfavourable – no change Upper Thurne Broads and Marshes SSSI: 63.97% favourable; 16.65% unfavourable – recovering; 4.82% unfavourable – no change; 14.57% unfavourable – declining. Upton Broad & Marshes SSSI: 7.43% favourable; 91.84% unfavourable – recovering; 0.72% unfavourable – no change Yare Broads and Marshes SSSI: 39.22% favourable; 11.30% unfavourable – recovering; 47.27% unfavourable – no change; 2.2% unfavourable – declining.

[137] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	The Broads SAC (UK0013577)	
Site Improvement Plan (SIP)	1) Water pollution (diffuse pollution) – Threat: H3140 Calcium-rich nutrient-poor lakes, lochs and pools; H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H91E0 Alder woodland on floodplains, S1016 Desmoulin`s whorl snail, S1355 Otter – Diffuse Water Pollution Plan to identify and investigate sources and pathways of diffuse pollution from roads, in particular. 3) Water pollution (pollutants entering the Broads SAC from point sources) – Threat: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, H6410 Purple moor-grass meadows, H7140 Very wet mires often identified by an unstable `quaking` surface, H7230 Calcium-rich springwater-fed fens, H91E0 Alder woodland on floodplains, S1016 Desmoulin`s whorl snail, S1355 Otter, S1903 Fen orchid, S4056 Little ramshorn whirlpool snail – Water Industry Asset Management Plan (AMP) to reduce phosphate entering the Broads SAC from STW. 5) Invasive species – Pressure: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, H6410 Purple moor-grass meadows, H7140 Very wet mires often identified by an unstable `quaking` surface, H7230 Calcium-rich springwater-fed fens, H91E0 Alder woodland on floodplains, S1016 Desmoulin`s whorl snail, S1355 Otter, S1903 Fen orchid, S4056 Little ram shorn whirlpool snail – Invasive Control Plan and monitor current and future invasive. 6) Siltation – Pressure: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, S1355 Otter – Lake Restoration Project. 8) Inappropriate water levels – Pressure: H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, S1355 Otter – Manage water levels to support the notified features of interest through implementation of appropriate agri-environment measures. 12) Inappropriate ditch management –Threat: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, H6410 Purple moor-grass meadows, H7140 Very wet mires often identified by an unstable `quaking` surface, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water-fed fens, H91E0 Alder woodland on floodplains, S1016 Desmoulin`s whorl snail, S1355 Otter, S1903 Fen orchid, S4056 Little ramshorn whirlpool snail – Habitat creation / restoration strategy. 13) Inappropriate scrub control – Pressure: H6410 Purple moor-grass meadows, H7140 Very wet mires often identified by an unstable `quaking` surface, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich spring water-fed fens, S1903 Fen orchid – Develop and implement a programme of further work to address scrub encroachment on sites where this remains an issue. 21) Air pollution: impact of pressure atmospheric nitrogen deposition – Pressure: H3140 Calcium-rich nutrient-poor lakes, lochs and pools, H3150 Naturally nutrient-rich lakes or lochs which are often dominated by pondweed, H6410 Purple moor-grass meadows, H7140 Very wet mires often identified by an unstable 'quaking' surface, H7210 Calcium-rich fen dominated by great fen sedge (saw sedge), H7230 Calcium-rich springwater-fed fens, H91E0 Alder woodland on floodplains, S1016 Desmoulin`s whorl snail, S1355 Otter – Develop a Site Nitrogen Action Plan.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Costessey (Heigham WTW)	The proposed drought permit would secure water supply by allowing a temporary increase in the maximum annual licensed abstraction rate from the Costessey groundwater source when flows in the River Wensum are low. The proposed drought permit proposes an increase in the maximum annual abstraction from the Costessey groundwater source from 2000Ml/yr to 4800Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The existing sources are located within approximately 20km of The Broads SAC. The Broads SAC covers 5,885.347ha and is located within the River Yare catchment. The River Wensum is a tributary of the River Yare and therefore increased abstraction is proposed upstream of The Broads SAC. The river Wensum meets the River Yare south of Norwich, approximately 5km upstream of The Broads SAC. Potential impact pathways include reduced flow rates in the River Wensum, reduced groundwater refilling rates, water quality deterioration and increased siltation.	**No**

Habitats Site name:	The Broads SAC (UK0013577)	
	Habitat Feature: H3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.*; H3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation; H7140 Transition mires and quaking bogs; H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae;* H1903 Fen orchid *Liparis loeselii;* H7230 Alkaline fens; H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* Alno-Padion, Alnion incanae, Salicion albae and H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae* **Construction:** There is no construction phase associated with this Drought Option, and therefore no LSE are anticipated upon The Broads SAC. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. However, the River Yare is influenced by tidal activity, where the upper tidal limit is located upstream of the SAC resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. Additionally, the anticipated hydrological impact to the River Yare was determined to be "negligible" in both summer and winter. Therefore, no LSE, from the Drought Option alone are anticipated upon The Broads SAC. There is potential for residual effects in-combination with other plans and projects, therefore, The Broads SAC site should be included within the in-combination assessment.	
	Species Feature: S1016 Desmoulin's whorl snail and S4056 Ramshorn snail **Construction:** There is no construction phase associated with this Drought Option, and therefore no LSE are anticipated upon The Broads SAC. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Desmoulin's whorl snail and Ram's-horn snails are not designated at any SSSIs underpinning the SAC. Given the distance to the SAC from the existing boreholes and the ZoI, no LSE are anticipated during operation of the Drought Option as the anticipated impact upon the River Yare is anticipated to be 'negligible'. Therefore, no LSE, from the Drought Option alone, is anticipated upon the qualifying species, from construction and operation. There is potential for residual effects in-combination with other plans and projects, therefore, The Broads SAC site should be included within the in-combination assessment.	**No**
	Species Feature: S1903 Fen orchid **Construction:** There is no construction phase associated with this Drought Option, and therefore no LSE are anticipated upon The Broads SAC. **Operation**: Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Although fen orchid are ground water dependant fauna the anticipated impact upon the River Yare is anticipated to be 'negligible'. Therefore, no LSE, from the Drought Option alone, is anticipated upon the qualifying species, from construction and operation. There is potential for residual effects in-combination with other plans and projects, therefore, The Broads SAC site should be included within the in-combination assessment.	**No**
	Species Feature: S1355 Otter **Construction:** There is no construction phase associated with this Drought Option, and therefore no LSE are anticipated upon The Broads SAC. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Within The Broads SAC, otter is only	**No**

Habitats Site name:	The Broads SAC (UK0013577)	
	recorded at Hardley Flood SSSI and Trinity Broads SSSI located within an approximate 30km radius of the existing sources. The SAC is located within the foraging range for male otters. However, the operation of the Drought Option is not likely to negatively impact the otter population within the SAC as the anticipated impact upon the River Yare is anticipated to be 'negligible'. Therefore, no LSE are anticipated during operation of the Drought Option alone. There is potential for residual effects in-combination with other plans and projects, therefore, The Broads SAC site should be included within the in-combination assessment.	

Table AN- 13: Stage 1 Screening of The Wash & North Norfolk Coast SAC

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)	
Designation type and location	SAC, TF56534247	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**H1110 Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks -** On this site sandy sediments occupy most of the subtidal area, resulting in one of the largest expanses of sublittoral sandbanks in the UK. It provides a representative example of this habitat type on the more sheltered east coast of England. The subtidal sandbanks vary in composition and include coarse sand through to mixed sediment at the mouth of the embayment. Sublittoral communities present include large dense beds of brittlestars *Ophiothrix fragilis*. Species include the sand-mason worm *Lanice conchilega* and the tellin *Angulus tenuis*. Benthic communities on sandflats in the deeper, central part of the Wash are particularly diverse. The subtidal sandbanks provide important nursery grounds for young commercial fish species, including plaice *Pleuronectes platessa*, cod *Gadus morhua* and sole *Solea solea*. **H1140 Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats -** The Wash, on the east coast of England, is the second-largest area of intertidal flats in the UK. The sandflats in the embayment of the Wash include extensive fine sands and drying banks of coarse sand, and this diversity of substrates, coupled with variety in degree of exposure, means that there is a high diversity relative to other east coast sites. Sandy intertidal flats predominate, with some soft mudflats in the areas sheltered by barrier beaches and islands along the north Norfolk coast. The biota includes large numbers of polychaetes, bivalves and crustaceans. Salinity ranges from that of the open coast in most of the area (supporting rich invertebrate communities) to estuarine close to the rivers. Smaller, sheltered and diverse areas of intertidal sediment, with a rich variety of communities, including some eelgrass *Zostera* spp. beds and large shallow pools, are protected by the north Norfolk barrier islands and sand spits. **H1150 Coastal lagoons -** Coastal lagoons are areas of shallow, coastal salt water, wholly or partially separated from the sea by sandbanks, shingle or, less frequently, rocks. Lagoons show a wide range of geographical and ecological variation; five main sub-types have been identified in the UK, on the basis of their physiography, as meeting the definition of the Annex I habitat type. **H1160 Large shallow inlets and bays -** The Wash is the largest embayment in the UK, and represents Large shallow inlets and bays on the east coast of England. It is connected via sediment transfer systems to the north Norfolk coast. Together, the Wash and North Norfolk Coast form one of the most important marine areas in the UK and European North Sea coast, and include extensive areas of varying, but predominantly sandy, sediments subject to a range of conditions. Communities in the intertidal include those characterised by large numbers of polychaetes, bivalve and crustaceans. Sublittoral	

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)
	communities cover a diverse range from the shallow to the deeper parts of the embayments and include dense brittlestar beds and areas of an abundant reef-building worm ('ross worm') *Sabellaria spinulosa*. The embayment supports a variety of mobile species, including a range of fish and 1365 Common seal *Phoca vitulina*. **H1170 Reefs -** The Wash is the largest embayment in the UK with extensive areas of subtidal mixed sediment. In the tide-swept approaches to the Wash, with a high loading of suspended sand, the relatively common tube-dwelling polychaete worm *Sabellaria spinulosa* forms areas of biogenic **reef**. These structures are varied in nature, and include reefs which stand up to 30 cm proud of the seabed and which extend for hundreds of metres (Foster-Smith & Sotheran 1999). The reefs are thought to extend into The Wash where super-abundant *S. spinulosa* occurs and where reef-like structures such as concretions and crusts have been recorded. The site and its surrounding waters is considered particularly important as it is the only currently known location of well-developed stable *Sabellaria* reef in the UK. The reefs are particularly important components of the sublittoral as they are diverse and productive habitats which support many associated species (including epibenthos and crevice fauna) that would not otherwise be found in predominantly sedimentary areas. As such, the fauna is quite distinct from other biotopes found in the site. Associated motile species include large numbers of polychaetes, mysid shrimps, the pink shrimp *Pandalus montagui*, and crabs. *S. spinulosa* is considered to be an important food source for the commercially important pink shrimp *P. montagui* (see overview in Holt *et al*. 1998). **H1310 Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand -** The largest single area of this vegetation in the UK occurs at this site on the east coast of England, which is one of the few areas in the UK where saltmarshes are generally accreting. The proportion of the total saltmarsh vegetation represented by *Salicornia* and other annuals colonising mud and sand is high because of the extensive enclosure of marsh in this site. The vegetation is also unusual in that it forms a pioneer community with common cord-grass *Spartina anglica* in which it is an equal component. The inter-relationship with other habitats is significant, forming a transition to important dune, saltmeadow and halophytic scrub communities. **H1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae* -** This site on the east coast of England is selected both for the extensive ungrazed saltmarshes of the North Norfolk Coast and for the contrasting, traditionally grazed saltmarshes around the Wash. The Wash saltmarshes represent the largest single area of the habitat type in the UK. The Atlantic salt meadows form part of a sequence of vegetation types that are unparalleled among coastal sites in the UK for their diversity and are amongst the most important in Europe. Saltmarsh swards dominated by sea-lavenders Limonium spp. are particularly well-represented on this site. In addition to typical lower and middle saltmarsh communities, in North Norfolk there are transitions from upper marsh to freshwater reedswamp, sand dunes, shingle beaches and mud/sandflats. **H1420 Mediterranean and thermo-Atlantic halophilous scrubs *Sarcocornetea fruticosi*; Mediterranean saltmarsh scrub -** The Wash and North Norfolk Coast, together with the North Norfolk Coast, comprises the only area in the UK where all the more typically Mediterranean species that characterise Mediterranean and thermo-Atlantic halophilous scrubs occur together. The vegetation is dominated by a shrubby cover up to 40 cm high of scattered bushes of shrubby sea-blite *Suaeda vera* and sea-purslane *Atriplex portulacoides*, with a patchy cover of herbaceous plants and bryophytes. This scrub vegetation often forms an important feature of the upper saltmarshes, and extensive examples occur where the drift-line slopes gradually and provides a transition to dune, shingle or reclaimed sections of the coast. At a number of locations on this coast perennial glasswort *Sarcocornia perennis* forms an open mosaic with other species at the lower limit of the sea-purslane community. **S1355 Lutra lutra; Otter -** The otter *Lutra lutra* is a semi-aquatic mammal, which occurs in a wide range of ecological conditions, including inland freshwater and coastal areas (particularly in Scotland). Populations in coastal areas utilise shallow, inshore marine areas for feeding but also require fresh water for bathing and terrestrial areas for resting and breeding holts. Coastal otter habitat ranges from sheltered wooded inlets to more open, low-lying coasts. Inland

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)
	populations utilise a range of running and standing freshwaters. These must have an abundant supply of food (normally associated with high water quality), together with suitable habitat, such as vegetated river banks, islands, reedbeds and woodland, which are used for foraging, breeding and resting. **S1365 Phoca vitulina; Common seal -** The Wash, on the east coast of England, is the largest embayment in the UK. The extensive intertidal flats here and on the North Norfolk Coast provide ideal conditions for Harbour seal *Phoca vitulina* breeding and hauling-out. This site is the largest colony of common seals in the UK, with some 7% of the total UK population.
Current conservation status (JNCC, 2019, Article 17[138] and Article 12[139])	**H1110 Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks** **Overall assessment of conservation status:** unfavourable/bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** unknown **Main pressure and threats:** Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Transmission of electricity and communications (cables) (D06), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Other invasive alien species (other then species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Sea-level and wave exposure changes due to climate change (N04), Threat Ranking Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01), Dumping/depositing of inert materials from terrestrial extraction (C06), Wind, wave and tidal power, including infrastructure (D01), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Change of habitat location, size, and / or quality due to climate change (N05), Desynchronisation of biological / ecological processes due to climate change (N06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change **H1140 Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats** **Overall assessment of conservation assessment of conservation status:** Unfavourable-bad (range – favourable; area – unknown; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** unknown **Main pressure and threats:** Agricultural activities generating marine pollution, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture, Other invasive alien species (other than species of Union concern), Mixed source marine water pollution (marine and coastal), Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Sports, tourism and leisure activities, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, Marine fish and shellfish

[138] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[139] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

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	harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats, Introduction and spread of species (including GMOs) in marine aquaculture. **H1150 Coastal lagoons** **Overall assessment of conservation status:** Unfavourable/inadequate (range: favourable, area: favourable, structure and function: unfavourable – inadequate, future prospects: unknown). **Overall trend in conservation status:** stable **Main pressure and threats:** Agricultural activities generating marine pollution (A28), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Modification of flooding regimes, flood protection for residential or recreational development (F28), Other invasive alien species (other then species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Modification of hydrological flow (K04), Temperature changes (e.g. rise of temperature & extremes), due to climate change (N01), Increases or changes in precipitation due to climate change (N03), Sea-level and wave exposure changes due to climate change (N04), Change of habitat location, size, and / or quality due to climate change (N05), Agricultural activities generating marine pollution (A28), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), (F08), Modification of flooding regimes, flood protection for residential or recreational development (F28), Other invasive alien species (other than species of Union concern) (I02), Modification of hydrological flow (K04), Temperature changes (e.g. rise of temperature & extremes), due to climate change (N01), Increases or changes in precipitation due to climate change (N03), Sea-level and wave exposure changes due to climate change (N04), Change of habitat location, size, and / or quality due to climate change (N05), Change of species distribution (natural newcomers), due to climate change (N08), **H1160 Large shallow inlets and bays** **Overall assessment of conservation status:** Unfavourable/inadequate (range: favourable, area: favourable, structure and function: unfavourable – inadequate, future prospects: unfavourable - inadequate). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Agricultural activities generating marine pollution (A28), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F22), Industrial or commercial activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F23), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Modification of coastal conditions for marine aquaculture (G15), Marine aquaculture generating marine pollution (G16), Mixed source marine water pollution (marine and coastal) (J02), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Industrial or commercial activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F23), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Marine aquaculture generating marine pollution (G16), Other invasive alien species (other than species of Union concern) (I02), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Sea-level and wave exposure changes due to climate change (N04), Change of species distribution (natural newcomers) due to climate change (N08).

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	H1170 Reefs **Overall assessment of conservation status:** Unfavourable-Inadequate (range: unknown, area: unknown, structure and function: unfavourable – inadequate, future prospects: unfavourable - Inadequate). **Overall trend in conservation status:** Unknown. **Main pressure and threats:** Transmission of electricity and communications (cables) (D06), Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01) Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Marine aquaculture generating marine pollution (G16), Other invasive alien species (other than species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Sea-level and wave exposure changes due to climate change (N04), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03), Other invasive alien species (other than species of Union concern) (I02), Mixed source marine water pollution (marine and coastal) (J02), Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01), Change of habitat location, size, and / or quality due to climate change (N05), Desynchronisation of biological / ecological processes due to climate change (N06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change (N07), Change of species distribution (natural newcomers) due to climate change (N08). **H1310 Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand** **Overall assessment of conservation status:** Unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Unknown. **Main pressure and threats:** Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Harvesting or collecting of other wild plants and animals (excluding hunting and leisure fishing), Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **H1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*** **Overall assessment of conservation status:** unfavourable/bad (range – favourable; area – unfavourable/inadequate; specific structure and functions: unfavourable/bad; future prospects – unfavourable/bad). **Overall trend in conservation status:** Deteriorating. **Main pressure and threats:** Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of

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	coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Agricultural activities generating diffuse pollution to surface or ground waters, Wind, wave and tidal power, including infrastructure, Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging), Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Drainage, land reclamation or conversion of wetlands, marshes, bogs, etc. to industrial/commercial areas, Other invasive alien species (other then species of Union concern), Mixed source air pollution, air-borne pollutants, Physical alteration of water bodies, Sea-level and wave exposure changes due to climate change **H1420 Mediterranean and thermo-Atlantic halophilous scrubs *Sarcocornetea fruticosi*; Mediterranean saltmarsh scrub** **Overall assessment of conservation status:** Unfavourable - bad (range: favourable, area: Unfavourable - Inadequate, structure and function: Unfavourable - bad, future prospects: Unfavourable - bad). **Overall trend in conservation status:** Stable. **Main pressure and threats:** Intensive grazing or overgrazing by livestock, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change, Intensive grazing or overgrazing by livestock, Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures), Mixed source air pollution, air-borne pollutants, Sea-level and wave exposure changes due to climate change. **S1355 *Lutra lutra*; Otter** **Overall assessment of conservation status:** Favourable (range – favourable; population – favourable; habitat for the species: favourable; future prospects – favourable). **Overall trend in conservation status:** Stable. **Main pressure and threats:** modification of hydrological flow or physical alteration of water bodies for agriculture; roads, paths, railroads and related infrastructure; illegal shooting/killing; bycatch and incidental killing; mixed source pollution to surface and ground waters; mixed source marine water pollution; use of plant protection chemical in agriculture. **S1365 *Phoca vitulina*; Common seal** **Overall assessment of conservation status:** Unfavourable - Inadequate (range – favourable; population – Unfavourable - Inadequate; habitat for the species: Unknown; future prospects – Unfavourable - Inadequate). **Overall trend in conservation status:** Unknown. **Main pressure and threats:** Industrial or commercial activities and structures generating noise, light, heat or other forms of pollution (F25), Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Management of fishing stocks and game (G08), Interspecific relations (competition, predation, parasitism, pathogens) (L06), Wind, wave and tidal power, including infrastructure (D01), Industrial or commercial activities and structures generating noise, light, heat or other forms of pollution, Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01), Management of fishing stocks and game (G08),

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	Interspecific relations (competition, predation, parasitism, pathogens) (L06), Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change.
Conservation objectives:	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 qualifying natural habitats and habitats of qualifying species The structure and function (including typical species) of qualifying natural habitats The structure and function of the habitats of qualifying species The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The populations of qualifying species, and, The distribution of qualifying species within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[140].	Gibraltar Point SSSI: 60.33% favourable, 31.21% unfavourable – recovering, 8.47% unfavourable - declining North Norfolk Coast SSSI: 38.72% favourable, 0.58% unfavourable – recovering, 13.38% unfavourable - no change, 47.32% unfavourable - declining The Wash SSSI: 67.98% favourable, 31.61% unfavourable – recovering, 0.41% unfavourable - declining
Site Improvement Plan (SIP)	1 Inappropriate water levels - Pressure: A021(B) Bittern, A081(B) Marsh harrier, A132(B) Avocet, A162(NB) Common redshank - Ensure the correct management of water levels in freshwater habitats 2 Public Access/Disturbance - Threat: A021(B) Bittern, A037(NB) Bewick's swan, A040(NB) Pinkfooted goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A081(B) Marsh harrier, A084(B) Montagu's harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1140 Intertidal mudflats and sandflats, H1160 Shallow inlets and bays, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2190 Humid dune slacks, S1365 Common seal, Waterbird assemblage - Investigate and identify measures to counteract effects of disturbance 3 Siltation - Threat: H1110 Subtidal sandbanks, H1140 Intertidal mudflats and sandflats, H1150 Coastal lagoons, H1310 Glasswort and other annuals colonising mud and sand, H1420 Mediterranean saltmarsh scrub, H2130 Dune grassland, H2190 Humid dune slacks - Monitoring to assess siltation and beach nourishment 4 Fisheries: Recreational marine and estuarine - Threat: A021(B) Bittern, A037(NB) Bewick's swan, A040(NB) Pink-footed goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A081(B) Marsh harrier, A084(B) Montagu's harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bartailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Implement the recreational sea angling strategy 5 Invasive species - Threat: H1110 Subtidal sandbanks, H1140 Intertidal mudflats and sandflats, H1160 Shallow inlets and bays, H1170 Reefs, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub - Introduction pathways investigation by SEFINS project to address scale of issue and determine mechanisms for management.

[140] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

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	6 Inappropriate coastal management - Threat: A021(B) Bittern, A081(B) Marsh harrier, A193(B) Common tern, H1150 Coastal lagoons, H1310 Glasswort and other annuals colonising mud and sand, H2110 Shifting dunes, H2130 Dune grassland, H2190 Humid dune slacks - Respond to increased risk of tidal flooding on freshwater habitats
	7 Fisheries: Commercial marine and estuarine - Threat: A021(B) Bittern, A037(NB) Bewick's swan, A040(NB) Pink-footed goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A081(B) Marsh harrier, A084(B) Montagu's harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Put in place necessary management measures
	8 Predation - Threat: A021(B) Bittern, A132(B) Avocet, A176(B) Mediterranean gull, A191(B) Sandwich tern, A192(B) Roseate tern, A193(B) Common tern, A195(B) Little tern - Ensure adequate protection of nesting birds from predators.
	9 Coastal squeeze - Threat: A040(NB) Pink-footed goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A130(NB) Eurasian oystercatcher, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, H1150 Coastal lagoons, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, H2110 Shifting dunes, H2130 Dune grassland, H2190 Humid dune slacks, Waterbird assemblage - Ensure mitigation and compensation for loss of habitats if appropriate
	10 Fisheries: Commercial marine and estuarine - Threat: H1140 Intertidal mudflats and sandflats, H1160 Shallow inlets and bays, H1170 Reefs - Continued implementation of bye-law that has been in place from May 2014
	11 Fisheries: Commercial marine and estuarine - Threat: A021(B) Bittern, A037(NB) Bewick's swan, A040(NB) Pink-footed goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A081(B) Marsh harrier, A084(B) Montagu's harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage - Introduction of management measures by Eastern IFCA
	12 Public Access/Disturbance- Threat: A021(B) Bittern, A037(NB) Bewick's swan, A040(NB) Pink-footed goose, A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A050(NB) Wigeon, A051(NB) Gadwall, A054(NB) Pintail, A065(NB) Common scoter, A067(NB) Goldeneye, A081(B) Marsh harrier, A084(B) Montagu's harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A141(NB) Grey plover, A143(NB) Red knot, A144(NB) Sanderling, A149(NB) Dunlin, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A160(NB) Curlew, A162(NB) Common redshank, A169(NB) Turnstone, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage - Coordinate information exchange regarding sensitive areas
	13 Change in land Natural England, RSPB management - Pressure: H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1420 Mediterranean saltmarsh scrub - Address the issue across the site using evidence from RSPB research, and implement management where appropriate
	14 Air Pollution: impact of Natural England atmospheric nitrogen deposition - Pressure: H1150 Coastal lagoons, H1220 Coastal shingle vegetation outside the reach of waves, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H1420 Mediterrane an saltmarsh scrub, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2190 Humid dune slacks, S1395 Petalwort - Establish a Site Nitrogen Action Plan
	15 Changes in species distributions - Pressure: A195(B) Little tern - Consider options for habitat creation
Potential Effects	

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)	
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Rutland Water)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling of Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr) would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF from 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. The Wansford Intake is located within an approximate 50km radius of The Wash and North Norfolk Coast SAC and approximately within 65km via hydrological connectivity. The SAC is located on the East Coast of England and is important for its coastal habitats and associated species. The SAC covers 107,761.28ha. **Habitat Feature: 1110 Sandbanks which are slightly covered by seawater all the time, 1140 Mudflats and sandflats not covered by seawater at low tide, 1150 Coastal lagoons, 1160 Large shallow inlets and bays, 1170 Reefs (including *Sabellaria spinulosa* reefs), 1310 *Salicornia* and other annuals colonising mud and sand, 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae,* 1420 Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticose*** **Species Feature: S1365 Common seal *Phoca vitulina*** **Construction** There is no construction phase associated with this drought action. **Operation** Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Wansford Intake have been assessed as major within the ZoI (Reaches 1 and 2) in either the summer or the winter. No hydrological assessment has been carried out within Reach 3, downstream of Dog-in-a-Doublet due to the tidal influence on river flows. As the tide cycle influence the water flow and its physico-chemical composition, it is considered that operation of the drought permit will have a minor impact, if any, within Reach 3 and subsequently within the SAC. Therefore, no LSEs are anticipated on the habitat features nor on common seal qualifying feature of The Wash and North Norfolk Coast SAC.	**No**
	Species Feature: S1355 Otter *Lutra lutra* **Construction** There is no construction phase associated with this drought action. **Operation** Otters are very territorial, highly mobile and are known to use 20km or more of river habitat (The Mammal Society [141]), and male have been known to have a home range encompassing up to 50km of river (Chanin, 2003 [142]). The SAC is fed by various rivers, including the River Nene and is located within an approximate 65km radius of the Wansford Intake. Major impacts are anticipated during	**No**

[141] The Mammal Society. Species factsheet: the otter (*Lutra lutra*). https://www.mammal.org.uk/wp-content/uploads/2016/08/otter_complete.pdf

[142] Chanin P. (2003) *Ecology of the European Otter*. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)	
	operation of the drought permit within Reaches 1 and 2. The downstream end of Reach 2 is Dog-in-a-Doublet, approximately 40km from the SAC. Otters are associated with North Norfolk Coast SSSI underpinned by the SAC and located over 70km from Wansford Intake. While operation of the drought permit is anticipated to result in reduce water flow within the River Nene and its tributary based on the use of water in the area, operation is not anticipated to result in significant adverse effects upon otters associated with the SAC. Local otter population may be associated with the River Nene and surrounding watercourses, but it is unlikely that they will be associated with the SAC. Therefore, no LSEs are anticipated on the otter qualifying feature of The Wash and North Norfolk Coast SAC.	
River Nene (Pitsford Water)	The maximum reduction in flow under the River Nene at Duston Mill drought permit is 17.05Ml/d, with the MRF in the Nene reduced from the baseline value of 34.1Ml/d to 17.05Ml/d. This reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate (phosphorus should be below annual mean of 0.1 mgl^{-1}), salinity and increased siltation on submerged macrophyte communities. The reduction in annual Q95 and Q50 is 49.9% and 18.5% respectively, which is assessed as a moderate hydrological impact during winter. This impact could lower water levels and lead to turbidity change which may expose littoral shelves, reduce macrophyte extent, and degrade forage quality. Higher nutrient/longer residence could increase bloom risk leading to reduced water clarity and macrophyte decline. The Duston Mill intake is within an approximate 110km radius of the The Wash and North Norfolk Coast SAC. **<u>Habitat Feature:</u> 1110 Sandbanks which are slightly covered by seawater all the time, 1140 Mudflats and sandflats not covered by seawater at low tide, 1150 Coastal lagoons, 1160 Large shallow inlets and bays, 1170 Reefs (including *Sabellaria spinulosa* reefs), 1310 *Salicornia* and other annuals colonising mud and sand, 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae,* 1420 Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticose*** **<u>Species Feature:</u> S1365 Common seal *Phoca vitulina*** **Construction** There is no construction phase associated with this drought action. **Operation** Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from WRCs and tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Duston Mill Intake will not extend as far downstream as The Wash and North Norfolk Coast SAC. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 6, which is upstream of The Wash and North Norfolk Coast SAC. There is a potential impact pathway due to reduced nutrient dilution capacity downstream, however, inputs from Great Billing WRC, Broadholme WRC and Flag Fen WRC are expected to increase flows downstream of the abstraction point, as well as inputs from associated tributaries of the River Nene. Therefore, no LSEs are anticipated from this drought permit.	**No**
	S1355 Otter *Lutra lutra* **Construction** There is no construction phase associated with this drought action. **Operation**	**No**

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)	
	Otters are very territorial, highly mobile and are known to use 20km or more of river habitat (The Mammal Society [18]), and male have been known to have a home range encompassing up to 50km of river (Chanin, 2003 [19]). The SAC is fed by various rivers, including the River Nene and is located over 100km downstream of the Duston Mill Intake. Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from WRCs and tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Duston Mill Intake will not extend as far downstream as The Wash and North Norfolk Coast SAC. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 6, which is upstream of The Wash and North Norfolk Coast SAC. There is a potential impact pathway due to reduced nutrient dilution capacity downstream, however, inputs from Great Billing WRC, Broadholme WRC and Flag Fen WRC are expected to increase flows downstream of the abstraction point, as well as inputs from associated tributaries of the River Nene. Therefore, no LSEs are anticipated from this drought permit.	
River Gt Ouse (Grafham Water)	The Offord Intake is located within an approximate 75km radius of The Wash and North Norfolk Coast SAC and within approximately 100km via hydrological connectivity. The SAC is located on the East Coast of England and is important for its coastal habitats and associated species. The SAC covers 107,761.28ha. **<u>Habitat Feature:</u> 1110 Sandbanks which are slightly covered by seawater all the time, 1140 Mudflats and sandflats not covered by seawater at low tide, 1150 Coastal lagoons, 1160 Large shallow inlets and bays, 1170 Reefs (including *Sabellaria spinulosa* reefs), 1310 *Salicornia* and other annuals colonising mud and sand, 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae,* 1420 Mediterranean and thermo-Atlantic *halophilous* scrubs *Sarcocornetea fruticose*** **<u>Species Feature:</u> S1365 Common seal *Phoca vitulina*** **Construction** There is no construction phase associated with this drought action. **Operation** A 50% reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Due to the distance between the intake and the SAC, changes in the flow regime or physio-chemical status to the extent of the Wash and North Norfolk Coast SAC is not anticipated. Freshwater input in the Ouse estuary is relatively low and minor importance in comparison to estuarine/marine processes. In addition, mean high water springs (the upper tidal limit) is located upstream resulting in considerable mixing of freshwater and saline water prior to reaching the SAC downstream. The impact of freshwater flow reductions on the SAC will be negligible due to the tidal nature of the SAC and the freshwater input from other rivers. Therefore, no LSEs are anticipated.	**No**
	<u>Species Feature:</u> S1355 Otter *Lutra lutra* **Construction** There is no construction phase associated with this drought action. **Operation**	**No**

Habitats Site name:	The Wash & North Norfolk Coast SAC (UK0017075)	
	Otters are very territorial, highly mobile and are known to use 20km or more of river habitat (The Mammal Society [143]), and male have been known to have a home range encompassing up to 50km of river (Chanin, 2003 [144]). The SAC is located within an approximate 75km radius of the Offord Intake. Due to the distance between the intake and the SAC, changes in the flow regime or physio-chemical status to the extent of the Wash and North Norfolk Coast SAC is not anticipated. Local otter population may be associated with the River Gt Ouse and surrounding watercourses, but it is unlikely that they will be associated with the SAC. Therefore, no LSEs are anticipated on the otter qualifying feature of The Wash and North Norfolk Coast SAC.	

Screening assessment of the Special Protection Areas (SPA) and Ramsar Sites

Table AN- 14: Stage 1 Screening of Abberton Reservoir SPA and Ramsar site

Habitats Site name:	Abberton Reservoir SPA and Ramsar site (UK9009141, UK11001)	
Designation type and location	SPA and Ramsar site, TG438209	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**SPA** A005 *Podiceps cristatus*; Great crested grebe (Non-breeding) A017 *Phalacrocorax carbo*; Great cormorant (Breeding) A036 *Cygnus olor*; Mute swan (Non-breeding) A050 *Anas penelope*; Eurasian wigeon (Non-breeding) A051 *Anas strepera*; Gadwall (Non-breeding) A052 *Anas crecca*; Eurasian teal (Non-breeding) A056 *Anas clypeata*; Northern shoveler (Non-breeding) A059 *Aythya ferina*; Common pochard (Non-breeding) A061 *Aythya fuligula*; Tufted duck (Non-breeding) A067 *Bucephala clangula*; Common goldeneye (Non-breeding) A125 *Fulica atra*; Common coot (Non-breeding) Waterbird assemblage	**Ramsar site** Gadwall, *Anas strepera* - Wintering Shoveler, *Anas clypeata* - Wintering Wigeon, *Mareca penelope* – Wintering Waterbird assemblage - Wintering

[143] The Mammal Society. Species factsheet: the otter (*Lutra lutra*). https://www.mammal.org.uk/wp-content/uploads/2016/08/otter_complete.pdf

[144] Chanin P. (2003) *Ecology of the European Otter*. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

Habitats Site name:	Abberton Reservoir SPA and Ramsar site (UK9009141, UK11001)
Current conservation status (JNCC, 2019, Article 17[145] and Article 12[146])	**A050 *Anas penelope*; Eurasian wigeon (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A051 *Anas strepera*; Gadwall (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A052 *Anas crecca*; Eurasian teal (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A056 *Anas clypeata*; Northern shoveler (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A059 *Aythya ferina*; Common pochard (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing **A061 *Aythya fuligula*; Tufted duck (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A067 *Bucephala clangula*; Common goldeneye (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: stable **A125 *Fulica atra*; Common coot (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: stable
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring: The extent and distribution of the habitats of the qualifying features; The structure and function of the habitats of the qualifying features; The supporting processes on which the habitats of the qualifying features rely; The population of each of the qualifying features; and The distribution of the qualifying features within the site.
SSSI Condition assessment (Appendix 2 for detailed per unit)[147].	Abberton Reservoir SSSI: 100.00% unfavourable – declining
Site Improvement Plan (SIP)	1 Situation - Pressure/threat: A005(NB) Great Crested Grebe, A017(B) Great cormorant, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall , A052(NB) Eurasian teal, A056(NB) Shoveler, A059(NB) Common pochard, A061(NB) Tufted Duck, A067(NB) Goldeneye, A125(NB) Common coot, A140(NB) Golden Plover, Waterbird assemblage, Reduce the sediment load in reservoir inflow 2 Public Access/Disturbance - Pressure/ Threat: A005(NB) Great Crested Grebe, A017(B) Great cormorant, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A059(NB) Common pochard, A061(NB) Tufted Duck, A067(NB) Goldeneye, A125(NB) Common coot, A140(NB) Golden Plover, Waterbird assemblage, Monitor and seek to reduce disturbance, particularly by aircraft 3 Planning general – Threat: A005(NB) Great Crested Grebe, A017(B) Great cormorant, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A059(NB) Common pochard, A061(NB) Tufted Duck, A067(NB) Goldeneye, A125(NB) Common coot, A140(NB) Golden Plover, Waterbird assemblage, Develop guidance on impacts of new development near wetland SPAs 4 Changes in species distributions – Pressure: A017(B) Great cormorant, Investigate reduction in numbers of breeding cormorants 5 Bird strike – Pressure/Threat: A036(NB) Mute swan, Install new bird scarers on overhead powerline 6 Water Pollution – Threat: A036(NB) Mute swan, A056(NB) Shoveler, A059(NB) Common pochard, A061(NB) Tufted Duck, Investigate potential impacts of changes in nutrient levels

[145] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[146] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[147] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Abberton Reservoir SPA and Ramsar site (UK9009141, UK11001)	
	7 Air Pollution: risk of atmospheric nitrogen deposition Threat: A036(NB) Mute swan, A056(NB) Shoveler, A059(NB) Common pochard, A061(NB) Tufted Duck, Investigate potential atmospheric nitrogen impacts on the site	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Lower Colne (Ardleigh Reservoir)	The drought permit licence will increase the daily licence at Balkerne by 3Ml/d (6Ml/d to 9Ml/d), for the purpose of additional augmentation to the river from Balkerne. The daily licence rates for Aldham and Cooks Mill stay the same but allows the sources to run at 6 Ml/d for 6 months i.e. for the transfer of water directly into the supply system at up to 6Ml/d. The augmentation and public water supply parts of the instantaneous, annual and group licence conditions will be amended to take into account usage during a six-month drought permit. Abberton Reservoir is located within an approximate 7km radius of the abstraction point at Balkerne. Potential impact pathways include reduced flow rates in the River Colne, reduced groundwater refilling rates, water quality deterioration and increased siltation. This could have an impact on the feeding grounds of qualifying features for both the SPA and Ramsar site. **Species Features: A051 *Anas strepera*; Gadwall (Non-breeding), A052 Anas crecca; Eurasian teal (Non-breeding), A056 *Anas clypeata*; Northern shoveler (Non-breeding), A059 *Aythya ferina*; Common pochard (Non-breeding), A061 *Aythya fuligula*; Tufted duck (Non-breeding), A067 *Bucephala clangula*; Common goldeneye (Non-breeding), A125 *Fulica atra*; Common coot (Non-breeding), Waterbird assemblage** **Construction:** There is no construction phase associated with the drought permit, and therefore no LSE are anticipated upon the Abberton Reservoir SPA and Ramsar site. **Operation:** The proposed temporary increase in borehole abstraction and river augmentation may change river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats and species, within the River Colne. The Drought Permit may therefore result in temporary impacts upon surrounding habitats including grasslands and arable fields. Due to the potential impacts anticipated upon the River Colne, habitats that may support wintering birds are considered to be impacted. Therefore, LSEs during operation of the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects cannot be ruled out.	**Yes**
	Ramsar site specific features: Saltmarsh, Wetland invertebrate assemblages, and Wetland plant assemblages **Construction:** There is no construction phase associated with the Lower Colne (Ardleigh Reservoir) Drought Permit, and therefore no LSE are anticipated upon the Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site. **Operation**: Potential impact pathways due to the abstraction and augmentation include changes in flow rates in the River Colne, reduced groundwater refilling rates, water quality deterioration and increased siltation. All species either directly require aquatic or intertidal habitats. Any change in estuarine hydrology, salinity, water quality, or tidal exposure patterns can influence habitat quality and thus affect these species' survival or breeding success. Therefore, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	**Yes**

Table AN- 15: Stage 1 Screening of Breckland SPA

Habitats Site name:	**Breckland SPA (UK9009201)**	
Designation type and location	SPA, TL 81762 85819	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	A133 *Burhinus oedicnemus*; Stone-curlew (Breeding) A224 *Caprimulgus europaeus*; European nightjar (Breeding) A246 *Lullula arborea*; Woodlark (Breeding)	
Current conservation status (JNCC, 2019, Article 12[148])	**A133 Stone-curlew (Breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing. **A224 European nightjar (Breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing. **A246 Woodlark (Breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring: The extent and distribution of the habitats of the qualifying features; The structure and function of the habitats of the qualifying features; The supporting processes on which the habitats of the qualifying features rely; The population of each of the qualifying features; and The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[149].	Barnham Heath SSSI: 89.45% favourable, 10.55% unfavourable – recovering Breckland Farmland SSSI: 100.00% unfavourable – declining Breckland Forest SSSI: 0.09% favourable, 99.91% unfavourable – recovering Cranberry Rough Hockham SSSI: 21.62% favourable, 78.38% unfavourable – recovering Deadman's Grave SSSI: 68.86% unfavourable – recovering, 31.14% unfavourable - declining Eriswell Low Warren SSSI: 100.00% favourable How Hill Track SSSI: 100.00% favourable Little Heath Barnham SSSI: 13.52% favourable, 2.59% unfavourable – recovering, 83.89% unfavourable - declining Old Bodney Camp SSSI: 100.00% favourable Rex Graham Reserve SSSI: 100.00% favourable.	

[148] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[149] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Breckland SPA (UK9009201)	
	West Stow Heath SSSI: 14.51% favourable, 85.49% unfavourable – recovering.	
Site Improvement Plan (SIP)	As detailed in Breckland SAC	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Wellington Wellfield (Stoke Ferry & Marham WTW)	As detailed in the assessment completed for The Breckland SAC, the proposed drought permit is to increase the daily licenced abstraction of the Wellington Wellfield and Denton Lodge groundwater source. The existing boreholes are located within The Breckland SPA. The Breckland SPA covers 39,432.55ha and includes a mosaic of heather dominated heathland with acid and calcareous grasslands. The remnants of the dry heath and grassland that remain within the SPA support populations of breeding birds, where grazing by sheep and rabbits is sufficiently intensive to create short turf and open ground. The groundwater ZoI for this drought permit has been defined as approximately 13km from the Wellington Wellfield boreholes, only including areas where groundwater drawdowns in relevant hydrogeological 'layers' is more than 0.01m greater in the drought permit scenario compared to the fully licenced baseline scenario. This updated ZoI encompasses the Breckland SPA. Modelling has shown that baseline groundwater level depths range between 1.69 - 24.5m (summer) and 0.98 - 23.3m (winter) (see Section 4.3.1 in DP27 Wellington Wellfield EAR). The minimum groundwater levels may decrease by 0.26m in summer and 0.22m in winter. Impacts during the summer can be screened out as the groundwater is not high enough where abstraction will cause Groundwater Dependent Terrestrial Ecosystem's (GWDTE's) conditions to decrease, therefore, impacts in summer are negligible. Stone curlew (March to October) breed on the heaths and grassland as well as on the arable land and occasionally within conifer plantations especially on areas of heath created within the forest. In recent times they have taken to nesting on fallow land . Nightjar (May to August) breed almost exclusively in afforested land, particularly in clear-fells and young plantations, and use open heaths and grasslands together with some arable land outside of the forest for feeding. Woodlark (February to July) utilise the open grassland and heather heaths for breeding and occasionally nest on the margins of arable areas. In recent times they have taken to nesting on fallow land and the system of rotational clear-felling within the conifer plantations also provides ideal breeding conditions for woodlark. Outside the confines of the forest woodlark use both grasslands and arable land for feeding. Stone curlew, nightjar and woodlark also use resources outside their immediate breeding areas in the SPA, including arable land and heaths for post-breeding flocks. **<u>Species Features:</u> A133 *Burhinus oedicnemus*; Stone-curlew (Breeding), A224 *Caprimulgus europaeus*; European nightjar (Breeding), A246 *Lullula arborea*; Woodlark (Breeding)** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Breckland SPA. **Operation**: Impacts from the Drought Permit are considered negligible during the summer months (April to September). The height, cover, variation and composition of vegetation are often important characteristics of habitats supporting features which enable successful nesting/rearing/concealment/roosting. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature. The qualifying features are breeding nightjar, stone curlew and woodlark which are all water dependent. A potential impact pathway during operation (overlapping with breeding season) is habitat loss if supporting habitats of the qualifying species were groundwater dependent. Supporting habitat for nightjar, stone curlew and woodlark include grass heath and conifer plantations which are not classified as groundwater dependent. Therefore, no mechanisms for habitat loss have been identified and no LSEs are anticipated .	**No**

Table AN- 16: Stage 1 Screening of Breydon SPA and Ramsar site

Habitats Site name:	**Breydon Water SPA and Ramsar site (UK9009181, UK11008)**	
Designation type and location	SPA and Ramsar site, TG48550682	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**SPA** A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding) A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding) A140 *Pluvialis apricaria*; European golden plover (Non-breeding) A142 *Vanellus vanellus*; Northern lapwing (Non-breeding) A151 *Philomachus pugnax*; Ruff (Non-breeding) A193 *Sterna hirundo*; Common tern (Breeding) Waterbird assemblage	**Ramsar site** **Ramsar criterion 5** Assemblages of international importance: Species with peak counts in winter: 68175 waterfowl (5-year peak mean 1998/99-2002/2003) **Ramsar criterion 6 – species/populations occurring at levels of international importance.** Qualifying Species/populations (as identified at designation): Species with peak counts in winter: Tundra swan, *Cygnus columbianus bewickii*, NW Europe 171 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9- 2002/3) Northern lapwing, *Vanellus vanellus*, Europe - breeding 20142 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Curent conservation status (JNCC, 2019, Article 17[150] and Article 12[151])	**A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)** – short-term trend of population size: decreasing; long-term population size trend: decreasing. **A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing. **A140 *Pluvialis apricaria*; European golden plover (Non-breeding)** – short-term trend of population size: decreasing; long-term population size trend: increasing. **A142 *Vanellus vanellus*; Northern lapwing (Non-breeding)** – short-term trend of population size: decreasing; long-term population size trend: increasing. **A151 *Philomachus pugnax*; Ruff (Non-breeding)** – short-term trend of population size: decreasing; long-term population size trend: increasing. **A193 *Sterna hirundo*; Common tern (Breeding)** – short-term trend of population size: decreasing; long-term population size trend: decreasing.	

[150] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[151] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitats Site name:	Breydon Water SPA and Ramsar site (UK9009181, UK11008)	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring: The extent and distribution of the habitats of the qualifying features; The structure and function of the habitats of the qualifying features; The supporting processes on which the habitats of the qualifying features rely; The population of each of the qualifying features; and The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[152].	Breydon Water SSSI: 100.00% favourable. Halvergate Marshes SSSI: 24.74% favourable; 9.02% unfavourable – recovering; 66.23%unfavourable – no change.	
Site Improvement Plan (SIP)	1) Shooting/scaring – Threat: A037(NB) Bewick's swan, A132(NB) Avocet, A140(NB) Golden plover, A142(NB) Northern lapwing, A151(NB) Ruff, A193(B) Common tern, Waterbird assemblage – investigate and advise wildfowl shooting 2) Change in land management – Threat: A037(NB) Bewick's swan, A132(NB) Avocet, A140(NB) Golden plover, A142(NB) Northern lapwing, A151(NB) Ruff, A193(B) Common tern, Waterbird assemblage – Monitoring and advice to raise awareness of the potential impact of surrounding habitat change on interest features. 3) Public Access/Disturbance - Threat: A037(NB) Bewick's swan, A132(NB) Avocet, A140(NB) Golden plover, A142(NB) Northern lapwing, A151(NB) Ruff, A193(B) Common tern, Waterbird assemblage – Investigate the impact of recreational disturbances. 4) Hydrological changes - Threat: A037(NB) Bewick's swan, A132(NB) Avocet, A140(NB) Golden plover, A142(NB) Northern lapwing, A151(NB) Ruff, A193(B) Common tern, Waterbird assemblage – Change the water level management practice. 5) Fisheries: Commercial marine and estuarine - Threat: A037(NB) Bewick's swan, A132(NB) Avocet, A140(NB) Golden plover, A142(NB) Northern lapwing, A151(NB) Ruff, A193(B) Common tern, Waterbird assemblage – Introduce appropriate management where required and ensure compliance.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**

[152] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Breydon Water SPA and Ramsar site (UK9009181, UK11008)	
Costessey (Heigham WTW)	The proposed drought permit would secure water supply by allowing a temporary increase in the maximum annual licensed abstraction rate from the Costessey groundwater source when flows in the River Wensum are low. The proposed drought permit proposes an increase in the maximum annual abstraction from the Costessey groundwater source from 2000Ml/yr to 4800Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The existing sources are located within an approximate 30km radius of the Breydon Water SPA and Ramsar site. Potential impact pathways include reduced flow rates in the River Wensum, reduced groundwater refilling rates, water quality deterioration and increased siltation. **<u>Species features:</u> A037 Bewick's swan (non-breeding), A132 Pied avocet (non-breeding), A140 European golden plover (non-breeding), A142 Northern lapwing and A151 Ruff (non-breeding), A193 Common tern (breeding)** Non-breeding (wintering) habitats for these species include arable fields and pasture for Bewick's swan, brackish water for Pied avocet, intertidal, grassland and farmland for Golden plover and Northern lapwing, reedbed, shallow water around lakes and we tland areas near the coast, on seashores and tidal mudflats for ruff. **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSEs are anticipated. **Operation**: The proposed temporary increase in abstraction may reduce river flows, affect groundwater levels, and alter water quality, with potential impacts on flow-dependent habitats and species, particularly during low-flow periods, within the River Wensum which feeds into the River Yare. The Drought Action may therefore result in temporary impacts upon surrounding habitats including grasslands and arable fields. This Drought Action is likely to be implemented in the summer during low flow and therefore wintering birds would not be directly impacted by an increase in water flows. Due to the minor impacts anticipated upon the River Wensum, habitats that may support wintering birds are not considered water dependent and therefore are unlikely to be impacted. Therefore, no LSE are anticipated during operation of the Drought Action.	**No**

Table AN- 17: Stage 1 Screening of Broadland SPA and Ramsar site

Habitats Site name:	Broadland SPA and Ramsar site (UK9009253, UK11010)	
Designation type and location	SPA and Ramsar site, TG438209	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**<u>SPA</u>** Features of the Broadland SPA: A021 *Botaurus stellaris*; Great bittern (Breeding)	**<u>Ramsar site</u>** **Ramsar criterion 2**

Habitats Site name:	Broadland SPA and Ramsar site (UK9009253, UK11010)	
	A037 *Cygnus columbianus bewickii*; Bewick's swan or tundra swam (Non-breeding) A038 *Cygnus cygnus*; Whooper swan (Non-breeding) A050 *Anas penelope*; Eurasian wigeon (Non-breeding) A051 *Anas strepera*; Gadwall (Non-breeding) A056 *Anas clypeata*; Northern shoveler (Non-breeding) A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding) A082 *Circus cyaneus*; Hen harrier (Non-breeding) A151 *Philomachus pugnax*; Ruff (Non-breeding) (a) It is used regularly by 1% or more of the GB population of a species listed on Annex 1 of the Birds Directive: great bittern, Bewick's swan, whooper swan, marsh harrier, hen harrier and ruff. (b) It is used by 1% or more of the biogeographic population of a regularly occurring migratory species in any season: wigeon (1.2% NW Europe), gadwall (4% NW Europe), and shoveler (1.7% NW Europe).	The site supports a number of rare species and habitats within the biogeographical zone context, including the following Habitats Directive Annex I features: H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* H7230 Alkaline fens H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae* *Priority feature S1016 Desmoulin's whorl snail *Vertigo moulinsiana* S1355 Otter *Lutra lutra* S1903 Fen orchid *Liparis loeselii* **Ramsar criterion 6:** Species/populations occurring at levels of international importance Qualifying Species/populations (as identified at designation) with peak counts in winter: Tundra swan (or Bewick's swan) *Cygnus columbianus bewickii* Eurasian wigeon *Anas penelope* Gadwall *Anas strepera* Northern shoveler *Anas clypeata* Species/populations identified subsequent to designation for possible future consideration (species with peak counts in winter) under criterion 6: pink-footed goose *Anser brachyrhynchus* and greylag goose *Anser anser*.
Current conservation status (JNCC, 2019, Article 17[153] and Article 12[154])	**A021 Bittern *Botaurus stellaris* (breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing. **A037 Bewick's swan *Cygnus columbianus bewickii* (wintering)** – as detailed for Breydon Water SPA. ***A038* Whooper swan *Cygnus cygnus* (wintering)** – short-term trend of population size: increasing; long-term population size trend: increasing **A081 Marsh harrier *Circus aeruginosus* (breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing **A082 Hen harrier *Circus cyaneus* (wintering)** – short-term trend of population size: unknown; long-term population size trend: unknown **A861 Ruff *Philomachus pugnax* (wintering)** – as detailed for Breydon Water SPA. **A855 Wigeon *Anas Penelope* (wintering)** – short-term trend of population size: stable; long-term population size trend: increasing **A889 Gadwall *A. strepera* (wintering)** – short-term trend of population size: increasing; long-term population size trend: increasing **A857 Shoveler *A. clypeata* (wintering)** – short-term trend of population size: increasing; long-term population size trend: increasing **A040 Pink-footed goose *Anser brachyrhynchus* (wintering)** – short-term trend of population size: increasing; long-term population size trend: increasing	

[153] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[154] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitats Site name:	Broadland SPA and Ramsar site (UK9009253, UK11010)	
	A043 Greylag goose *Anser anser* (wintering) – short-term trend of population size: stable; long-term population size trend: stable **7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** – as detailed for Norfolk Valley Fens SAC. **7230 Alkaline fens –** as detailed for Norfolk Valley Fens SAC. **91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior: Alno-Padion, Alnion incanae, Salicion albae*** – as detailed for Norfolk Valley Fens SAC. **1016 Desmoulin's whorl snail *Vertigo moulinsiana*** – as detailed for River Wensum SAC. **1903 Fen orchid *Liparis loeselii* –** as detailed for The Broads SAC. **1355 Otter *Lutra lutra*** – as detailed for The Broads SAC.	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring: The extent and distribution of the habitats of the qualifying features; The structure and function of the habitats of the qualifying features; The supporting processes on which the habitats of the qualifying features rely; The population of each of the qualifying features; and The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[155].	As detailed for The Broads SAC (excluding Trinity Broads SSSI)	
Site Improvement Plan (SIP)	3) Water pollution (pollutants entering the Broadland from point sources) – Threat: A021(NB) bittern, A037(NB) Bewick's swan, A038(NB), whooper swan, A050(NB) wigeon, A051(NB) gadwall, A056(NB) shoveler, A081(B) marsh harrier, A082(NB) hen harrier, A151(NB) ruff– Water Industry Asset Management Plan (AMP) to reduce phosphate entering the Broadland from STW. 6) Siltation – Pressure: A037(NB) Bewick's swan, A051(NB) gadwall, A056(NB) shoveler– Lake Restoration Project. 12) Inappropriate ditch management –Threat: A021(B) bittern, A037(NB) Bewick's swan, A038(NB) whooper swan, A050(NB) wigeon, A051(NB) gadwall, A056(NB), shoveler, A081(B) marsh harrier, A082(NB) hen harrier, A151(NB) ruff– Habitat creation / restoration strategy. 21) Air pollution: impact of pressure atmospheric nitrogen deposition – Pressure: A021(NB) bittern, A037(NB) Bewick's swan, A038(NB), whooper swan, A050(NB) wigeon, A051(NB) gadwall, A056(NB) shoveler, A081(B) marsh harrier, A082(NB) hen harrier, A151(NB) ruff – Develop a Site Nitrogen Action Plan.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Costessey (Heigham WTW)	The proposed drought permit would secure water supply by allowing a temporary increase in the maximum annual licensed abstraction rate from the Costessey groundwater source when flows in the River Wensum are low. The proposed drought permit proposes an increase in the maximum annual abstraction from the Costessey groundwater source from 2000Ml/yr to 4800Ml/yr. As per current guidance[6], the drought permit would cover a six-month period, and it is understood that reapplication for a further six months would be permissible. The existing boreholes are upstream of the Broadland Ramsar site. The Ramsar site share the same boundary as The Broads SAC along the River Yare.	**No**

[155] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Broadland SPA and Ramsar site (UK9009253, UK11010)	
	Potential impact pathways include reduced flow rates in the River Wensum, reduced groundwater refilling rates, water quality deterioration and increased siltation. **Ramsar Site Habitat features: Floodplain alder woodland and floodplain fen** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Broadland Ramsar site. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. However, the River Yare is influenced by tidal activity, where the upper tidal limit is located upstream of the Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the Ramsar site downstream. Additionally, the anticipated hydrological impact to the River Yare was determined to be "negligible" in both summer and winter. Therefore, no LSEs from the Drought Option alone are anticipated upon the Broadland Ramsar site. There is potential for residual effects in-combination with other plans and projects, therefore, Broadland Ramsar site should be included within the in-combination assessment.	
	Ramsar Site Species Feature: Wetland invertebrate assemblage, Wetland plant assemblage **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Broadland Ramsar site. **Operation:** Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. However, the River Yare is influenced by tidal activity, where the upper tidal limit is located upstream of the Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the Ramsar site downstream. Additionally, the anticipated hydrological impact to the River Yare was determined to be "negligible" in both summer and winter. Therefore, no LSEs from the Drought Option alone are anticipated upon the Broadland Ramsar site. There is potential for residual effects in-combination with other plans and projects, therefore, Broadland Ramsar site should be included within the in-combination assessment.	**No**
	Ramsar Site Species Feature: A037 Bewick's swan (*Cygnus columbianus bewickii*), Non-breeding, A051 Gadwall (*Mareca strepera*), non-breeding, A082 Hen harrier (*Circus cyaneus*), Non-breeding, A151 Ruff (*Calidris pugnax*), Non-breeding, A056 Shoveler (*Spatula clypeata*), Non-breeding, A038 Whooper swan (*Cygnus cygnus*), Non-breeding, A050 Wigeon (*Mareca penelope*), Non-breeding, A021 Bittern (*Botaurus stellaris*), Breeding, A081 Marsh harrier (*Circus aeruginosus*), Breeding **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Broadland Ramsar site. **Operation**: Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. However, the River Yare is influenced by tidal activity, where the upper tidal limit is located upstream of the Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the Ramsar site downstream. Additionally, the anticipated hydrological impact to the River Yare was determined to be "negligible" in both summer and winter. Therefore, no LSEs from the Drought Option alone are anticipated upon the Broadland Ramsar site. There is potential for residual effects in-combination with other plans and projects, therefore, Broadland Ramsar site should be included within the in-combination assessment.	**No**

Habitats Site name:	Broadland SPA and Ramsar site (UK9009253, UK11010)	
	SPA Species features: **A037 Bewick's swan (*Cygnus columbianus bewickii*), Non-breeding, Gadwall (*Mareca strepera*), non-breeding, Hen harrier (*Circus cyaneus*), Non-breeding, Ruff (*Calidris pugnax*), Non-breeding, Shoveler (*Spatula clypeata*), Non-breeding, Whooper swan (*Cygnus cygnus*), Non-breeding, Wigeon (*Mareca penelope*), Non-breeding, Bittern (*Botaurus stellaris*), Breeding, Marsh harrier (*Circus aeruginosus*), Breeding** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Broadland SPA. **Operation**: Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. However, the River Yare is influenced by tidal activity, where the upper tidal limit is located upstream of the SPA resulting in considerable mixing of freshwater and saline water prior to reaching the SPA downstream. Additionally, the anticipated hydrological impact to the River Yare was determined to be "negligible" in both summer and winter. Therefore, no LSEs from the Drought Option alone are anticipated upon the Broadland SPA. There is potential for residual effects in-combination with other plans and projects, therefore, Broadland SPA should be included within the in-combination assessment.	**No**

Table AN- 18: Stage 1 Screening of Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site

Habitats Site name:	Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site (UK9009243, UK11015)	
Designation type and location	SPA and Ramsar site, TM05511963	**Water Dependent?** All features have been identified as water dependant.

Habitats Site name:	Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site (UK9009243, UK11015)	
Qualifying features	**SPA** A046a *Branta bernicla bernicla*; Dark-bellied brent goose (Non-breeding) A059 *Aythya ferina*; Common pochard (Breeding) A082 *Circus cyaneus*; Hen harrier (Non-breeding) A137 *Charadrius hiaticula*; Ringed plover (Breeding) A162 *Tringa totanus*; Common redshank (Non-breeding) A195 *Sterna albifrons*; Little tern (Breeding) Waterbird assemblage	**Ramsar site** **Ramsar criterion 1** The site is important due to the extent and diversity of saltmarsh present. This site, and the four other sites in the Mid-Essex Coast complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain. **Ramsar criterion 2** The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species. **Ramsar criterion 3** This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain. **Ramsar criterion 5** Assemblages of international importance: Species with peak counts in winter: 32041 waterfowl (5 year peak mean 1998/99-2002/2003) **Ramsar criterion 6 – species/populations occurring at levels of international importance.** Qualifying Species/populations (as identified at designation): Species with peak counts in winter: Dark-bellied brent goose, *Branta bernicla bernicla:* 3165 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9-2002/3) Common redshank, *Tringa totanus tetanus:* 1624 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: Black-tailed godwit, *Limosa limosa islandica*, Iceland/W Europe: 402 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9- 2002/3)
Current conservation status (JNCC, 2019, Article 17[156] and Article 12[157])	**A046a *Branta bernicla bernicla*; Dark-bellied brent goose (Non-breeding)** – short-term trend of population size: Stable; long-term population size trend: increasing. **A059 *Aythya ferina*; Common pochard (Breeding)** – short-term trend of population size: increasing; long-term population size trend: increasing. **A082 *Circus cyaneus*; Hen harrier (Non-breeding)** – short-term trend of population size: unknown; long-term population size trend: unknown. **A137 *Charadrius hiaticula*; Ringed plover (Breeding)** – short-term trend of population size: increasing; long-term population size trend: Stable. **A162 *Tringa totanus*; Common redshank (Non-breeding)** – short-term trend of population size: decreasing; long-term population size trend: stable. **A195 *Sterna albifrons*; Little tern (Breeding)** – short-term trend of population size: decreasing; long-term population size trend: decreasing.	

[156] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[157] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitats Site name:	Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site (UK9009243, UK11015)
Conservation objectives:	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 the qualifying features; The structure and function of the habitats of the qualifying features; The supporting processes on which the habitats of the qualifying features rely; The population of each of the qualifying features; and The distribution of the qualifying features within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[158].	Colne Estuary SSSI: 25.26% favourable; 74.57% unfavourable – recovering; 0.18% unfavourable – declining. Upper Colne Marshes SSSI: 53.26% favourable; 46.74%unfavourable – recovering.
Site Improvement Plan (SIP)	1 Coastal squeeze – Pressure/Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage – Investigate impacts on the site to inform development of remedial actions. 2 Public Access/Disturbance – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage - Analyse disturbance effects and manage public access to minimise disturbance. 3 Fisheries: Commercial marine and estuarine - Pressure/Threat: H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Where the assessments indicate management is required, introduce appropriate measures. 4 Planning Permission: general – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Blacktailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Collate and analyse data to develop guidance for the site. 5 Changes in species distributions – Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A151(NB) Ruff, A157(NB) Bar-tailed godwit, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, Waterbird assemblage: Investigate site level and larger scale factors affecting the declining SPA species. 6 Invasive species – Pressure/Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310

[158] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site (UK9009243, UK11015)	
	Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage - Investigate impacts of Pacific oyster and other non-native marine species and identify possible management. 7 Fisheries: Recreational marine and estuarine – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Investigate the extent of impact of bait digging on the site. 8 Fisheries: Commercial marine and estuarine - Pressure/ Threat: A046a(NB) Dark-bellied Brent goose, H1130 Estuaries, H1140 Intertidal mudflats and sandflats - Introduce new byelaw for bottom towed gear, and ensure compliance. 9 Fisheries: Commercial marine and estuarine - Pressure/ Threat: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1110 Subtidal sandbanks, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub, Waterbird assemblage - Investigate and assess potential pressures from private and several fisheries, and identify possible management. 10 Invasive species – Pressure: A046a(NB) Dark-bellied Brent goose, A048(NB) Common shelduck, A059(B) Common pochard, A082(NB) Hen harrier, A130(NB) Eurasian oystercatcher, A132(B) Avocet, A132(NB) Avocet, A137(B) Ringed plover, A137(NB) Ringed plover, A140(NB) Golden plover, A141(NB) Grey plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1320 Cord-grass swards, Waterbird assemblage - Monitor Spartina anglica and assess effects on interest features. 11 Air Pollution: risk of atmospheric nitrogen deposition – Pressure: A046a(NB) Dark-bellied Brent goose, A191(B) Sandwich tern, A193(B) Common tern, A195(B) Little tern, H1130 Estuaries, H1310 Glasswort and other annuals colonising mud and sand, H1320 Cord-grass swards, H1330 Atlantic salt meadows, H1420 Mediterranean saltmarsh scrub - Investigate potential atmospheric nitrogen impacts.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**
Lower Colne (Ardleigh Reservoir)	The drought permit licence will increase the daily licence at Balkerne by 3Ml/d (6Ml/d to 9Ml/d), for the purpose of additional augmentation to the river from Balkerne. The daily licence rates for Aldham and Cooks Mill stay the same but allows the sources to run at 6 Ml/d for 6 months i.e. for the transfer of water directly into the supply system at up to 6Ml/d. The augmentation and public water supply parts of the instantaneous, annual and group licence conditions will be amended to take into account usage during a six-month drought permit. Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site is within an approximate 8km radius of the abstraction point at Balkerne. **<u>SPA and Ramsar site species feature</u>: A059 *Aythya ferina*; Common pochard (Breeding), A082 *Circus cyaneus*; Hen harrier (Non-breeding), A137 *Charadrius hiaticula*; Ringed plover (Breeding), A162 *Tringa totanus*; Common redshank (Non-breeding), A195 *Sterna albifrons*; Little tern (Breeding), Waterbird assemblage, Black-tailed godwit, *Limosa limosa islandica*** **Construction:** There is no construction phase associated with the drought permit, and therefore no LSE are anticipated upon the Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site. **Operation:** Potential impact pathways due to the abstraction and augmentation include changes in flow rates in the River Colne, reduced groundwater refilling rates, water quality deterioration and increased siltation. All species either directly require aquatic or	**Yes**

Habitats Site name:	Colne Estuary (Mid-Essex Coast Phase 2) SPA and Ramsar site (UK9009243, UK11015)	
	intertidal habitats (e.g. brent goose, redshank, little tern, pochard) or indirectly rely on the estuarine wetland system for food, roosting, or breeding (e.g. hen harrier, ringed plover). Any change in estuarine hydrology, salinity, water quality, or tidal exposure patterns can influence habitat quality and thus affect these species' survival or breeding success. Therefore, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	
	Ramsar site specific features: **Saltmarsh, Wetland invertebrate assemblages, Wetland plant assemblages** **Construction:** There is no construction phase associated with the drought permit, and therefore no LSE are anticipated upon the Colne Estuary (Mid-Essex Coast Phase 2) Ramsar site. **Operation**: Potential impact pathways due to the abstraction and augmentation include changes in flow rates in the River Colne, reduced groundwater refilling rates, water quality deterioration and increased siltation. All species either directly require aquatic or intertidal habitats. Any change in estuarine hydrology, salinity, water quality, or tidal exposure patterns can influence habitat quality and thus affect these species' survival or breeding success. Therefore, LSEs cannot be ruled out at this stage for the Lower Colne (Ardleigh Reservoir) Drought Permit alone or in-combination with other plans or projects.	

Table AN- 19: Stage 1 Screening of Humber Estuary SPA and Ramsar site

Habitat site name:	Humber Estuary SPA (UK9006111) & Humber Estuary Ramsar site (UK11031)	
Designation type and location	SPA and Ramsar site, TA01332446	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**SPA** A021 *Botaurus stellaris*; Great bittern (Non-breeding) A021 *Botaurus stellaris*; Great bittern (Breeding) A048 *Tadorna tadorna*; Common shelduck (Non-breeding) A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding) A082 *Circus cyaneus*; Hen harrier (Non-breeding) A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding) A132 *Recurvirostra avosetta*; Pied avocet (Breeding) A140 *Pluvialis apricaria*; European golden plover (Non-breeding) A143 *Calidris canutus*; Red knot (Non-breeding) A149 *Calidris alpina alpina*; Dunlin (Non-breeding) A151 *Philomachus pugnax*; Ruff (Non-breeding) A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)	**Ramsar site** **Ramsar criterion 1** The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. **Ramsar criterion 3** The Humber Estuary Ramsar site supports a breeding colony of grey seals Halichoerus grypus at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad Bufo calamita. **Ramsar criterion 5** Assemblages of international importance: 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001) **Ramsar criterion 6 – species/populations occurring at levels of international importance.**

Habitat site name:	Humber Estuary SPA (UK9006111) & Humber Estuary Ramsar site (UK11031)	
	A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding) A162 *Tringa totanus*; Common redshank (Non-breeding) A195 *Sterna albifrons*; Little tern (Breeding) Waterbird assemblage	Common shelduck, *Tadorna tadorna* Northwestern Europe (breeding) population 4,464 individuals, wintering, representing an average of 1.5% of the population (5 year peak mean 1996/7-2000/1) Eurasian golden plover, *Pluvialis apricaria altifrons* subspecies – NW Europe, W Continental Europe, NW Africa population 30,709 individuals, wintering, representing an average of 3.3% of the population (5 year peak mean 1996/7-2000/1) Red knot, *Calidris canutus islandica* subspecies 28,165 individuals, wintering, representing an average of 6.3% of the population (5 year peak mean 1996/7-2000/1) Dunlin, *Calidris alpina alpina* subspecies – Western Europe (non-breeding) population 22,222 individuals, wintering, representing an average of 1.7% of the population (5 year peak mean 1996/7-2000/1) Black-tailed godwit, *Limosa limosa islandica* subspecies 1,113 individuals, wintering, representing an average of 3.2% of the population (5 year peak mean 1996/7-2000/1) Bar-tailed godwit , *Limosa lapponica lapponica* subspecies 2,752 individuals, wintering, representing an average of 2.3% of the population (5 year peak mean 1996/7-2000/1) Common redshank, *Tringa totanus brittanica* subspecies 4,632 individuals, wintering, representing an average of 3.6% of the population (5 year peak mean 1996/7-2000/1) **Ramsar criterion 8** The Humber Estuary acts as an important migration route for both river lamprey Lampetra fluviatilis and sea lamprey Petromyzon marinus between coastal waters and their spawning areas.
Current conservation status (JNCC, 2019, Article 17[159] and Article 12[160])	**A021 *Botaurus stellaris*; Great bittern (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A021 *Botaurus stellaris*; Great bittern (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A048 *Tadorna tadorna*; Common shelduck (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: stable **A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A132 *Recurvirostra avosetta*; Pied avocet (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A140 *Pluvialis apricaria*; European golden plover (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A143 *Calidris canutus*; Red knot (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A149 *Calidris alpina alpina*; Dunlin (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: decreasing **A151 *Philomachus pugnax*; Ruff (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: stable	

[159] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[160] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitat site name:	Humber Estuary SPA (UK9006111) & Humber Estuary Ramsar site (UK11031)
	A162 *Tringa totanus*; Common redshank (Non-breeding) - short-term trend of population size: decreasing; long-term population size trend: stable **A195 *Sterna albifrons*; Little tern (Breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing
Conservation objectives:	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 the qualifying features The structure and function of the habitats of the qualifying features The supporting processes on which the habitats of the qualifying features rely The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[161].	Humber Estuary - 2000480 SSSI: 0.04% favourable, 56.66% unfavourable – recovering, 43.30% unfavourable – declining North Killingholme Haven Pits SSSI: 74.35% favourable, 25.65% unfavourable – no change Saltfleetby - Theddlethorpe Dunes SSSI: 78.78% favourable, 21.22% unfavourable – recovering The Lagoons SSSI: 100% unfavourable – no change
Site Improvement Plan (SIP)	1 Water Pollution: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, S1095 Sea lamprey, S1099 River lamprey, Waterbird assemblage - Investigate the effects of poor water quality on designated features 2 Coastal squeeze: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, Waterbird assemblage - Identify opportunities to compensate for the loss of intertidal habitat 3 Changes in species distributions: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, S1095 Sea lamprey, S1099 River lamprey, Waterbird assemblage - Investigate and address the potential changes in distribution and declines of bird and fish numbers 4 Undergrazing: A140(NB) Golden plover, A143(NB) Red knot, A151(NB) Ruff, A156(NB) Black-tailed godwit, A162(NB) Common redshank, H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2160 Dunes with sea buckthorn, Waterbird assemblage - Introduce grazing to affected areas through the delivery of the new Agri-environment scheme 5 Invasive species: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1330 Atlantic salt meadows, Waterbird assemblage - Gain an understanding of the presence of invasive species, and how to address the issue 6 Natural changes to site conditions: A021(B) Bittern, A021(NB) Bittern, A048(B) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Investigations, to gain an understanding of the changing topography and habitats

[161] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Humber Estuary SPA (UK9006111) & Humber Estuary Ramsar site (UK11031)
	7 Public Access/Disturbance: A021(B) Bittern, A021(NB) Bittern, A048(NB) Commo shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier A132(B) Avocet, A132(NB) Avocet, A140(NB) Golde plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern H1130 Estuaries, H1330 Atlantic salt meadows, Waterbird assemblage - Work with the recommendation from the Footprint Ecology report to address disturbance issues 8 Fisheries: Fish stocking: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, Waterbird assemblage - Give advice, and work with other organisations to control fish stocking 9 Fisheries: Commercial marine and estuarine: H1140 Intertidal mudflats and sandflats - Indicate where management is necessary and work with organisations to implement these measures 10 Fisheries: Commercial marine and estuarine: H1140 Intertidal mudflats and sandflats - Indicate where management is necessary and work with organisations to implement these measures 11 Direct land take from development: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1130 Estuaries, H1140 Intertidal mudflats and sandflats, Waterbird assemblage - Identify mechanisms to remove material from the intertidal and prevent further encroachment 12 Air Pollution: impact of atmospheric nitrogen deposition: H1310 Glasswort and other annuals colonising mud and sand, H1330 Atlantic salt meadows, H2110 Shifting dunes, H2120 Shifting dunes with marram, H2130 Dune grassland, H2160 Dunes with sea-buckthorn - Further investigate potential atmospheric nitrogen impact on the site 13 Shooting/ scaring: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, Waterbird assemblage - Investigate unconsented activities and agree an appropriate way forward 14 Direct impact from third party: A021(B) Bittern, A021(NB) Bittern, A048(NB) Common, shelduck, A081(B) Marsh harrier, A082(NB) Hen harrier, A132(B) Avocet, A132(NB) Avocet, A140(NB) Golden plover, A143(NB) Red knot, A149(NB) Dunlin, A151(NB) Ruff, A156(NB) Black-tailed godwit, A157(NB) Bar-tailed godwit, A162(NB) Common redshank, A195(B) Little tern, H1310 Glasswort and other annuals colonising mud and sand, Waterbird assemblage - Investigate and monitor the collection of Salicornia and implement management when required 15 Inappropriate scrub control: A081(B) Marsh harrier - Implement appropriate habitat management
Potential Effects	

Component	Screening Assessment	Likely significant effect (LSE) alone?
River Trent (Hall WTW)	The maximum reduction in flow under the River Trent (Hall WTW) Drought Permit is 40Ml/d when the River Trent flows are below the Hands Off Flow (HOF) condition set at 1,700Ml/d, but above 1,400Ml/d. **SPA and Ramsar site species features: A021 *Botaurus stellaris*; Great bittern (Non-breeding), A021 *Botaurus stellaris*; Great bittern (Breeding), A048 *Tadorna tadorna*; Common shelduck (Non-breeding), A081 *Circus aeruginosus*; Eurasian marsh harrier (Breeding), A082 *Circus cyaneus*; Hen harrier (Non-breeding), A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding), A132 *Recurvirostra avosetta*; Pied avocet (Breeding), A140 *Pluvialis apricaria*; European golden plover (Non-breeding), A143 *Calidris canutus*; Red knot (Non-breeding), A149 *Calidris alpina alpina*; Dunlin (Non-breeding), A151 *Philomachus pugnax*; Ruff (Non-breeding), A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding), A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding), A162 *Tringa totanus*; Common redshank (Non-breeding), A195 *Sterna albifrons*; Little tern (Breeding), Waterbird assemblage** **Construction**	**No**

Habitat site name:	Humber Estuary SPA (UK9006111) & Humber Estuary Ramsar site (UK11031)	
	There is no construction phase associated with this drought action. **Operation** The estimated change in flows due the proposed drought permit (0% between Q1-Q99 (see **Appendix A** for more details)) is well within the maximum change in flows proposed by the UKTAG Environmental Standards permitted to achieve or maintain Good Ecological Status (GES) within the Humber River Basin. Additionally, the abstraction site is located within an approximate 65km radius of the Humber Estuary SPA and Ramsar site via waterways. The Humber Estuary is highly influenced by tidal activity, where the upper tidal limit is located upstream of the SPA and Ramsar site resulting in considerable mixing of freshwater and saline water prior to reaching the Habitats Sites downstream. Given the distance from the existing boreholes and the tidal activity of the sites, any hydrological or water quality changed in the River Trent as a result of the Drought Permit as unlikely to have a significant impact on the SPA and Ramsar sites. Therefore, no LSEs are expected for any features within the SPA and Ramsar site as a result of the River Trent (Hall WTW) Drought Permit.	

Table AN- 20: Stage 1 Screening of Nene Washes SPA and Ramsar site

Habitat site name:	Nene Washes SPA (UK9008031) & Nene Washes Ramsar site (UK11046)	
Designation type and location	SPA and Ramsar site, TL30809915	**Water Dependent?** All features have been identified as water dependant.
Qualifying features	**SPA** A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding); A050 *Anas penelope*; Eurasian wigeon (Non-breeding) A051 *Anas strepera*; Gadwall (Breeding) A051 *Anas strepera*; Gadwall (Non-breeding) A052 *Anas crecca*; Eurasian teal (Non-breeding) A054 *Anas acuta*; Northern pintail (Non-breeding) A055 *Anas querquedula*; Garganey (Breeding) A056 *Anas clypeata*; Northern shoveler (Non-breeding) A056 *Anas clypeata*; Northern shoveler (Breeding) A156a *Limosa limosa limosa*; Black-tailed godwit (Breeding)	**Ramsar site** **Ramsar criterion 2** 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 **Ramsar criterion 6 – species/populations occurring at levels of international importance.** **Qualifying Species/populations (as identified at designation): Species with peak counts in winter:** Tundra swan, *Cygnus columbianus bewickii*, NW Europe: 694 individuals, representing an average of 2.3% of the population (5 year peak mean 1998/9- 2002/3) **Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in spring/autumn:** Black-tailed godwit, *Limosa limosa islandica*, Iceland/W Europe: 482 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9- 2002/3 - spring peak)

Habitat site name:	Nene Washes SPA (UK9008031) & Nene Washes Ramsar site (UK11046)	
		Species with peak counts in winter: Northern pintail, *Anas acuta*, NW Europe: 1848 individuals, representing an average of 3% of the population (5 year peak mean 1998/9- 2002/3)
Current conservation status (JNCC, 2019, Article 17[162] and Article 12[163])	**A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing **A050 *Anas penelope*; Eurasian wigeon (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A051 *Anas strepera*; Gadwall (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A051 *Anas strepera*; Gadwall (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A052 *Anas crecca*; Eurasian teal (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A054 *Anas acuta*; Northern pintail (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing **A055 *Anas querquedula*; Garganey (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A056 Anas clypeata Northern shoveler (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A056 *Anas clypeata*; Northern shoveler (Breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A156a *Limosa limosa limosa*; Black-tailed godwit (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing	
Conservation objectives:	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 the qualifying features The structure and function of the habitats of the qualifying features The supporting processes on which the habitats of the qualifying features rely The population of each of the qualifying features, and, The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[164].	Adventurers' Land SSSI: 100.00% favourable Nene Washes SSSI: 19.96% favourable, 80.04% Unfavourable – Recovering	
Site Improvement Plan (SIP)	1 Hydrological changes: A037(NB) Bewick's Swan, A050(NB) Wigeon, A051(B) Gadwall, A051(NB) Gadwall, A052(NB) Eurasian teal, A054(NB) Pintail, A055(B) Garganey, A056(B) Shoveler, A056(NB) Shoveler, A119(B) Spotted Crake, A151(B) Ruff, A151(NB) Ruff, A156a(B) Black-tailed Godwit, Waterbird assemblage: Monitoring of birds and water levels and flexible responses to yearly variations through liaison between key partners 2 Water Pollution: S1149 Spined loach: Undertake a review of water quality in Mortons Leam and ditches.	
Potential Effects		
Drought Action	**Screening Assessment**	**Likely significant effect (LSE) alone?**

[162] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[163] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[164] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Nene Washes SPA (UK9008031) & Nene Washes Ramsar site (UK11046)	
River Nene (Pitsford Water)	The maximum reduction in flow under the River Nene at Duston Mill drought permit is 17.05Ml/d, with the MRF in the Nene reduced from the baseline value of 34.1Ml/d to 17.05Ml/d. The Pitsford/Duston Mill intake is within an approximate 65km radius of the Nene Washes SPA and Ramsar and within approximately 85km via hydrological connectivity. **SPA and Ramsar site species features: Gadwall *Anas strepera*, garganey *A. querquedula*, shoveler *A. clypeata*, black-tailed godwits *Limosa limosa* (breeding), Wigeon *A. penelope*, teal *A. crecca*, pintail *A. acuta* and shoveler (winter), Waterfowl assemblage (summer and winter)** **Construction** There is no construction phase associated with this drought action. **Operation** the qualifying features are considered water dependant. Potential impact pathways on the Nene Washes SPA include reduced water flow during operation from December – April and May – November, and deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation. As water levels in the Nene Washes are maintained by inundation and controlled via a Water Level Management Plan, reduced water flow downstream of Rutland/Wansford Intake is unlikely to impact water levels in the Nene Washes. Given the distance between Duston Mill Intake and the Nene Washes SPA, the localised reduction in flow downstream of the intake is not anticipated to significantly impact on the qualifying species. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 4, which is upstream of the Nene Washes SPA. Therefore, no impact on water flow and the extent of wetted habitat in the Nene Washes SPA is anticipated and no in-combination effects with the River Nene (Wansford Intake/ Rutland Water) Drought Permit. There is a potential impact pathway due to reduced nutrient dilution capacity downstream, however, inputs from Great Billing WRC, Broadholme WRC and Flag Fen WRC are expected to increase flows downstream of the abstraction point, as well as inputs from associated tributaries of the River Nene. Therefore, no LSEs are anticipated from this drought option. Furthermore, due to the overall distance between Duston Mill Intake and the Nene Washes SPA, and the minor or negligible impacts impacted from Reach 3 onwards, the implementation of the drought option is not anticipated to results in LSE upon Functionally Linked Habitats.	**No**
	Ramsar site species features: Nationally scarce plant assemblage and invertebrate species including *Valvata macrostoma, Agabus undulatus, Libellula fulva and Anasimvia interpuncta*, nationally rare breeding birds and raptors, Bewick's swan; *Cygnus columbianus bewickii* **Construction** There is no construction phase associated with this drought action. **Operation** the qualifying features are considered water dependant. Potential impact pathways on the Nene Washes Ramsar include reduced water flow during operation from December – April and May – November, and deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation. As water levels in the Nene Washes are maintained by inundation and controlled via a Water Level Management Plan, reduced water flow downstream of Rutland/Wansford Intake is unlikely to impact water levels in the Nene Washes. Given the distance between Duston Mill Intake and the Nene Washes Ramsar, the localised reduction in flow downstream of the intake is not anticipated to significantly impact on the qualifying species. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 4, which is upstream of the Nene Washes Ramsar. Therefore, no impact on water flow and the extent of wetted habitat in the Nene Washes Ramsar is anticipated and no in-combination effects with the River	**No**

Habitat site name:	Nene Washes SPA (UK9008031) & Nene Washes Ramsar site (UK11046)	
	Nene (Wansford Intake/ Rutland Water) Drought Permit. There is a potential impact pathway due to reduced nutrient dilution capacity downstream, however, inputs from Great Billing WRC, Broadholme WRC and Flag Fen WRC are expected to increase flows downstream of the abstraction point, as well as inputs from associated tributaries of the River Nene. Therefore, no LSEs are anticipated from this drought option. Furthermore, due to the overall distance between Duston Mill Intake and the Nene Washes Ramsar, and the minor or negligible impacts impacted from Reach 3 onwards, the implementation of the drought option is not anticipated to results in LSE upon Functionally Linked Habitats.	
River Nene (Rutland Water)	**SPA and Ramsar site species features: Article 4.1: Bewick's swan *Cygnus columbarius bewickii* (winter)** **Article 4.2:** • **Gadwall *Anas strepera, g*arganey *A. querquedula, s*hoveler *A. clypeata* and black-tailed godwits *Limosa limosa* (breeding)** • **Wigeon *A. penelope, t*eal *A. crecca, g*adwall, pintail *A. acuta* and shoveler (winter)** **Waterfowl assemblage (summer and winter)** **Ramsar criterion 2: nationally scarce plant assemblage and invertebrate species including *Valvata macrostoma, Agabus undulatus, Libellula fulva* and *Anasimyia interpuncta*.** **Ramsar criterion 2: important assemblage of nationally rare breeding birds and raptors.** **Ramsar criterion 6: Bewick's swan *Cygnus columbarius bewickii* (winter)** **Construction:** There is no construction phase associated with this Drought Action, and therefore no LSE are anticipated upon the Nene Washes SPA and Ramsar site. **Operation**: the qualifying features are considered water dependant. Potential impact pathways on the Nene Washes SPA and Ramsar site include reduced water flow during operation from December – April and May – November, and deterioration in water quality (particularly nutrient concentrations, biochemical oxygen demand and salinity) and increased siltation. As water levels in the Nene Washes are maintained by inundation and controlled via a Water Level Management Plan, reduced water flow downstream of Rutland/Wansford Intake is unlikely to impact water levels in the Nene Washes. Operation of this drought action could result in deterioration in water quality via increased concentrations of orthophosphate in the watercourse. This could impact on sensitive wetland habitat associated with the Nene Washes. During autumn and winter operation of Rutland/Wansford Intake, the Stanground Sluice is kept open by 6 inches in order to provide a freshening flow and maintain the water levels for designated sites until the growing season begins again. During spring and summer, the Stanground Sluice is kept open, and the Nene Washes will be fully exposed to any changes in water quality, increased siltation and reduced water flow. This could impact on the structure and function of supporting habitat (macrophytes) and particularly breeding bird assemblage. Therefore LSEs cannot be ruled out at this stage.	**Yes**

Table AN- 21: Stage 1 Screening of Ouse Washes SPA and Ramsar site

Habitats Site name:	Ouse Washes SPA (UK9008041) and Ouse Washes Ramsar site (UK11051)	
Designation type and location	SPA and Ramsar site, TL480872	**Water Dependent?**

Habitats Site name:	Ouse Washes SPA (UK9008041) and Ouse Washes Ramsar site (UK11051)		
			All features have been identified as water dependant
Qualifying features	**SPA** A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding) A038 *Cygnus cygnus*; Whooper swan (Non-breeding) A050 *Anas penelope*; Eurasian wigeon (Non-breeding) A051 *Anas strepera*; Gadwall (Breeding) A052 *Anas crecca*; Eurasian teal (Non-breeding) A053 *Anas platyrhynchos*; Mallard (Breeding) A054 *Anas acuta*; Northern pintail (Non-breeding) A055 *Anas querquedula*; Garganey (Breeding) A056 *Anas clypeata*; Northern shoveler (Non-breeding) A056 *Anas clypeata*; Northern shoveler (Breeding) A082 *Circus cyaneus*; Hen harrier (Non-breeding) A151 *Philomachus pugnax*; Ruff (Breeding) A156a *Limosa limosa limosa*; Black-tailed godwit (Breeding) Waterbird assemblage Breeding bird assemblage	**Ramsar site** **Ramsar criterion 1a** The site is a good representative example of a natural or near-natural wetland characteristic of its biogeographic region. It is one of the most extensive areas of seasonally flooding washland of its type in Britain, and the wetland has high conservation value for many plants and animals. **Ramsar criterion 2a** The site supports appreciable numbers of nationally rare plants and animals. This includes several nationally scarce plants, including, small water pepper *Polygonum minus*, whorled water-*milfoil Myriophyllum verticillatum*, greater water parsnip *Sium latifolium*, river water-dropwort *Oenanthe fluviatilis*, fringed water-lily *Nymphoides peltata*, long-stalked pondweed *Potamogeton praelongus*, hair-like pondweed *Potamogeton trichoides*, grass-wrack pondweed *Potamogeton compressus*, tasteless water-pepper *Polygonum mite* and marsh dock *Rumex palustris*. Invertebrate records indicate that the site holds good relict fenland fauna, including the National Red Data Book species, large darter dragonfly *Libellula fulva* and the rifle beetle *Oulimnius major*. The site also supports a diverse assemblage of nationally rare breeding waterfowl associated with seasonally flooding wet grassland. **Ramsar criterion 5** Internationally important waterfowl assemblage (greater than 20,000 birds) **Ramsar criterion 6** Over winter the site regularly supports internationally important populations of: Bewick`s Swan *Cygnus columbianus bewickii*, Gadwall *Anas strepera*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Teal *Anas crecca,* Whooper *Swan Cygnus cygnus*, Wigeon *Anas penelope*	
Curent conservation status (JNCC,	**A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing **A038 *Cygnus cygnus*; Whooper (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A050 *Anas penelope*; Eurasian wigeon (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A051 *Anas strepera*; Gadwall (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A052 *Anas crecca*; Eurasian teal (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A053 *Anas platyrhynchos*; Mallard (Breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing		

Habitats Site name:	Ouse Washes SPA (UK9008041) and Ouse Washes Ramsar site (UK11051)
2019, Article 17[165] and Article 12[166])	**A054 *Anas acuta*; Northern pintail (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: decreasing **A055 *Anas querquedula*; Garganey (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A056 *Anas clypeata* Northern shoveler (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A056 *Anas clypeata*; Northern shoveler (Breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A082 *Circus cyaneus*; Hen harrier (Non-breeding)** - short-term trend of population size: unknown; long-term population size trend: unknown **A151 *Philomachus pugnax*; Ruff (Breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A156a *Limosa limosa limosa*; Black-tailed godwit (Breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing
Conservation objectives:	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 the qualifying features The structure and function of the habitats of the qualifying features The supporting processes on which the habitats of the qualifying features rely The population of each of the qualifying features, and, The distribution of the qualifying features within the site.
SSSI Condition assessment (**Appendix 2** for detailed per unit)[167].	Ouse Washes SSSI: 15.73% Favourable, 84.27% unfavourable - No change
Site Improvement Plan (SIP)	1 Inappropriate water levels: A050(NB) Wigeon, A056(B) Shoveler, A119(B) Spotted Crake, A151(B) Ruff, A156a(B) Black-tailed Godwit - Habitat creation to offset historical decline of wintering and breeding birds and other strategies to alleviate flooding 2 Water Pollution: A037(NB) Bewick's Swan, A038(NB) Whooper Swan, A050(NB) Wigeon, A051(B) Gadwall, A051(NB) Gadwall, A052(NB) Eurasian teal, A053(B) Mallard, A054(NB) Pintail, A055(B) Garganey, A056(B) Shoveler, A056(NB) Shoveler, A059(NB) Common pochard, A082(NB) Hen Harrier, A119(B) Spotted Crake, A151(B) Ruff, A151(NB) Ruff, A156a(B) Black-tailed Godwit, A156a(NB) Black-tailed Godwit, Breeding bird assemblage, S1149 Spined loach, Waterbird assemblage - Implementation of Diffuse Water Pollution plan to tackle inappropriate levels of nutrients from flooding.

Potential Effects

Component	Screening Assessment	Likely significant effect (LSE) alone?
River Gt Ouse (Grafham Water)	Under the proposed drought permit conditions, 2 stages of abstraction are permitted: Stage 1 - abstraction at up to 100% of the flow in excess of the MRF, stage 2 - 50% reduction MRF to 68 Ml/d, abstraction at up to 75% of the flow excess of the MRF. Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate (phosphorus should be below annual mean of 0.1 mgl^{-1}), salinity and increased siltation on submerged macrophyte communities. The Offord intake is located within an approximate 25km radius of the Ouse Washes SPA and Ramsar site and within approximately 30km via hydrological connectivity.	**Yes**

[165] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[166] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[167] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitats Site name:	Ouse Washes SPA (UK9008041) and Ouse Washes Ramsar site (UK11051)	
	SPA and Ramsar site features: **A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding), A038 *Cygnus cygnus*; Whooper swan (Non-breeding), A050 *Anas penelope*; Eurasian wigeon (Non-breeding), A051 *Anas strepera*; Gadwall (Breeding), A052 *Anas crecca*; Eurasian teal (Non-breeding), A053 *Anas platyrhynchos*; Mallard (Breeding), A054 *Anas acuta*; Northern pintail (Non-breeding), A055 *Anas querquedula*; Garganey (Breeding), A056 *Anas clypeata*; Northern shoveler (Non-breeding), A056 *Anas clypeata*; Northern shoveler (Breeding), A082 *Circus cyaneus*; Hen harrier (Non-breeding), A151 *Philomachus pugnax*; Ruff (Breeding), A156a *Limosa limosa limosa*; Black-tailed godwit (Breeding), Wigeon *Anas Penelope,* Pintail *Anas acuta*.** **Construction** There is no construction phase associated with this drought action. **Operation** A 50% reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. The SPA/Ramsar is located within Reach 2. Abstraction during low flow periods could cause deterioration in water quality including dissolved oxygen, ammonia and orthophosphate, salinity and increased siltation on submerged macrophyte communities. Water flow assessment has concluded that impacts are anticipated to be moderate to minor within Reach 2. Water quality assessments have also determined that major impacts are anticipated on orthophosphate concentrations in Reach 1 and 2 (Bedford Ouse at Brownshill Staunch to Salters Lode, 35km, SSSI unit 22) during Stage 2 of the drought permit in summer. No impacts on the salinity regime of the River Great Ouse are anticipated as infrastructure downstream of the Offord intake controls the flow rate of freshwater discharged to The Wash Estuary and 'natural' conditions will be maintained. Extended periods of low flow and fluctuations in abiotic conditions could cause increased algal growth potentially impacting on the assemblage of wetland plants and extent of supporting habitat for birds and invertebrates. Since the drought permit will only be used during low flow conditions, Offord intake is not anticipated to impact on the frequency or extent of downstream flooding that occurs during high flows. Flooding in the Ouse Washes is also one of the key mechanisms of habitat loss, specifically for breeding and wintering bird populations. Therefore, no terrestrial habitat loss is anticipated as a result of this drought permit. However, LSEs cannot be ruled out at this stage.	

Table AN- 22: Stage 1 Screening of Rutland Water SPA and Ramsar site

Habitat site name:	Rutland Water SPA (UK9008051) and Ramsar site (UK11062)	
Designation type and location	SPA and Ramsar site, SK90750781	**Water Dependent?** All features have been identified as water dependant
Qualifying features	**SPA** A005 *Podiceps cristatus*; Great crested grebe (Non-breeding) A036 *Cygnus olor*; Mute swan (Non-breeding) A050 *Anas penelope*; Eurasian wigeon (Non-breeding)	**Ramsar site** **Ramsar criterion 5** Assemblages of international importance: Species with peak counts in winter: 19274 waterfowl (5 year peak mean 1998/99-2002/2003)

Habitat site name:	Rutland Water SPA (UK9008051) and Ramsar site (UK11062)	
	A051 *Anas strepera*; Gadwall (Non-breeding) A052 *Anas crecca*; Eurasian teal (Non-breeding) A056 *Anas clypeata*; Northern shoveler (Non-breeding) A061 *Aythya fuligula*; Tufted duck (Non-breeding) A067 *Bucephala clangula*; Common goldeneye (Non-breeding) A070 *Mergus merganser*; Goosander (Non-breeding) A125 *Fulica atra*; Common coot (Non-breeding) Waterbird assemblage (Non-breeding)	**Ramsar criterion 6 – species/populations occurring at levels of international importance.** Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Gadwall, *Anas strepera strepera*, NW Europe 1014 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3) Northern shoveler, *Anas clypeata*, NW & C Europe 619 individuals, representing an average of 1.5% of the population (5 year peak mean 1998/9- 2002/3) Species/populations identified after designation for possible future consideration under criterion 6. Species with peak counts in spring/autumn: Mute swan, *Cygnus olor*, Britain 563 individuals, representing an average of 1.5% of the population (5 year peak mean 1998/9- 2002/3)
Curent conservation status (JNCC, 2019, Article 17[168] and Article 12[169])	**A005 *Podiceps cristatus*; Great crested grebe (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing **A036 *Cygnus olor*; Mute swan (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A050 *Anas penelope*; Eurasian wigeon (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A051 *Anas strepera*; Gadwall (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A052 *Anas crecca*; Eurasian teal (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: decreasing **A056 Anas clypeata Northern shoveler (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A061 *Aythya fuligula*; Tufted duck (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A067 *Bucephala clangula*; Common goldeneye (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: stable **A070 *Mergus merganser*; Goosander (Non-breeding)** - short-term trend of population size: stable; long-term population size trend: increasing **A125 *Fulica atra*; Common coot (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: stable	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring; • The extent and distribution of the habitats of the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, • The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for	Rutland Water SSSI: 100.00% favourable	

[168] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[169] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/

Habitat site name:	Rutland Water SPA (UK9008051) and Ramsar site (UK11062)	
detailed per unit)[170].		
Site Improvement Plan (SIP)	1 Water abstraction: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Explore the possibility of the inclusion of compensation areas within the designation 2 Inappropriate water levels: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Establish and maintain suitable compensatory habitats for waterfowl in the new lagoons during extreme drawdown events 3 Direct impact from 3rd party: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Monitor 3rd party impacts on waterfowl numbers and distribution 4 Invasive species: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Develop a non-native invasive species strategy 5 Water Pollution: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Establish a nutrient mass balance for the reservoir 6 Planning Permission: general: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Produce a planning and development strategy for Rutland Water 7 Public Access/Disturbance: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Develop a recreation strategy to maintain the suitability of Rutland Water for both recreation and nature conservation 8 Fisheries: Freshwater: A005(NB) Great Crested Grebe, A036(NB) Mute swan, A050(NB) Wigeon, A051(NB) Gadwall, A052(NB) Eurasian teal, A056(NB) Shoveler, A061(NB) Tufted Duck, A067(NB) Goldeneye, A070(NB) Goosander, A125(NB) Common coot, Waterbird assemblage - Produce a fishery management strategy	
Potential effects		
Component	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Rutland Water)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling of Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr) would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF from 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. This has been assessed as a major hydrological impact during summer and winter months. The River Nene (Rutland water) Drought Permit is within an approximate 20km radius of the Rutland Water SPA and Ramsar site and is hydrologically connected via a pipeline. Potential impact pathways include reduced flow rates in the River Nene, water quality deterioration and increased siltation. This could have an impact on foraging habitat for all water dependant qualifying species in the SPA/Ramsar.	**Yes**

[170] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Rutland Water SPA (UK9008051) and Ramsar site (UK11062)	
	SPA and Ramsar site species features: A005 *Podiceps cristatus*; Great crested grebe (Non-breeding), A036 *Cygnus olor*; Mute swan (Non-breeding), A050 *Anas penelope*; Eurasian wigeon (Non-breeding), A051 *Anas strepera*; Gadwall (Non-breeding), A052 *Anas crecca*; Eurasian teal (Non-breeding), A056 *Anas clypeata*; Northern shoveler (Non-breeding), A061 *Aythya fuligula*; Tufted duck (Non-breeding), A067 *Bucephala clangula*; Common goldeneye (Non-breeding), A070 *Mergus merganser*; Goosander (Non-breeding), A125 *Fulica atra*; Common coot (Non-breeding) **Construction** There is no construction phase associated with this drought action. **Operation** The drought permit involves increased refilling of Rutland Water through a 50% reduction in the MRF from 125Ml/d for December-April (winter) and 150Ml/d for May-November (summer), to 62.5Ml/d in the winter and 75Ml/d in the summer. Units of Rutland Water SSSI that overlaps in extent with the SPA are currently in favourable condition (units 029, 030 and 031). The operation of this proposed drought option would overlap with the timeframe that qualifying bird species of Rutland Water SPA are present at the site. The following potential indirect impact pathways have been identified: an increase in water depth and therefore, potential reduction in extent of shallow foraging habitat and deterioration in water quality, which could impact on macrophyte community assemblage and extent. The optimal depth for gadwall to forage in open water is <0.25m and for northern shoveler is 0.3m. As water levels in Rutland Water are controlled (consult with Wildlife Trust), it is anticipated that shallow foraging habitats will be maintained to continue supporting qualifying species of the SPA, and therefore implementation of the drought option is not considered to have an LSE upon water level within Rutland Water. In 2019, phosphate concentrations in the River Nene at Islip to tidal (GB105032050381) were classified as poor, and then classified as moderate in 2022[171]. Under drought conditions, it is anticipated that nutrient concentrations (phosphate in particular) of the abstracted water will be high. In supplementary advice for Rutland Water SPA, it suggests that meeting the surface water environmental standards set out by the WFD will be sufficient to support the SPA Conservation Objectives. Based on water quality data collected at Hambleton South Shore, Rutland Water in 2019 – 2020, total phosphorus concentrations were above the WFD EQS threshold for moderate alkalinity, deep waterbodies (mean phosphorus of 0.082 mg/l, annual mean threshold is 0.012 mg/l). Although it is anticipated that excess orthophosphate will be assimilated by perennial macrophytes in the system (e.g. Potamogeton species), there is uncertainty whether discharged water into Rutland Water will be within the specific WFD good EQS thresholds for moderate alkalinity, deep waterbodies. Elevated nutrient concentrations (particularly phosphate and nitrates) could lead to significant blue-green algal blooms and negative impacts on food availability if macrophyte community assemblages are altered. This is a known pressure on the system, in lagoons 2 and 3. Therefore LSEs cannot be ruled out at this stage.**	

Table AN- 23: Stage 1 Screening of The Wash SPA and Ramsar site

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)	
Designation type and location	SPA and Ramsar site, TF57634376	**Water Dependent?** Yes

[171] Environment Agency (2022). Nene – Islip to tidal. Catchment Data Explorer. Accessed from: Nene - Islip to tidal | Catchment Data Explorer | Catchment Data Explorer

<table>
<tr><th>Habitat site name:</th><th colspan="2">The Wash SPA (UK9008021) and Ramsar site (UK9008041)</th></tr>
<tr><td>Qualifying features</td><td><u>SPA</u>
Article 4.1: supports 30 breeding pairs of little terns Sterna albifrons (2% of the British population) and 220 pairs of common terns Sterna hirundo (2%), and because it supports 130 Bewick's swan Cygnus columbarius bewickii (3%) in winter.
Article 4.2: internationally important wetland by supporting in winter an average of 163,000 waders and also 51,000 wildfowl; and because it supports on average the following internationally important numbers of individual species: 17,000 dark-bellied brent geese Branta bernicla bernicla (12% of the European wintering population), 7,300 pink-footed geese Anser brachyrhynchus (7%), 16,000 shelducks Tadorna tadorna (12%), 1,700 pintails Anas acuta (2%), 24,000 oystercatchers Haematopus ostralegus (3%), 5,500 grey plovers Pluvialis squatarola (7%), 500 sanderlings Calidris alba (3%), 7,500 knots Calidris canutus (21%) 29,000 dunlins Calidris alpina (1%) 8,200 bar-tailed godwits Limosa lapponica (1%), 3,700 curlews Numenius arquata (1%), 4,331 redshanks Tringa totanus (5%) and 980 turnstones Arenaria interpres (2%).
In addition the site qualifies because of its national importance to other migratory birds. Wintering birds include 3,900 wigeon Anas penelope (2% of the British wintering population), 220 goldeneye Bucephala clangula (1%), 130 gadwall Anas strepera (3%), 830 common scoters Melanitta nigra (2%), 260 black-tailed godwits Limosa limosa (6%) and probably several gull species (Larus). Important populations of wintering passerines are also supported.</td><td><u>Ramsar Site</u>
Ramsar criterion 1: The Wash is a large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.

Ramsar criterion 3: Qualifies because of the inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with other organic matter, forms the basis for the high productivity of the estuary.

Ramsar criterion 5: assemblage of international importance. Species with peak counts in winter of 292,541 waterfowl (5-year peak mean 1998/99 – 2002/03).

Ramsar criterion 6 (species/population occurring at levels of international importance) (5-year peak mean 1998/99 – 2002/03):
Species with peak counts in spring/autumn: Eurasian oystercatcher (wintering) with 15,616 individuals representing an average of 1.5% of the population, grey plover (wintering) with 13,129 individuals representing an average of 5.3% of the population, red knot (wintering) with 68,987 individuals representing an average of 15.3% of the population, sanderling with 3,505 individuals representing an average of 2.8% of the population, Eurasian curlew (breeding) with 9,438 individuals representing an average of 2.2% of the population, common redshank with 6,373 individuals representing an average of 2.5% of the population, and Ruddy turnstone with 888 individuals representing an average of 1.7% of the GB population.
Species with peak counts in winter: pink-footed goose with 29,099 individuals representing an average of 12.1% of the population, dark-bellied brent goose with 20,861 individuals representing an average of 9.7% of the population, common shelduck with 9,746 individuals representing an average of 3.2% of the population, northern pintail with 431 individuals representing an average of 1.5% of the GB population, dunlin with 36,600 individuals representing an average of 2.7% of the population and bar-tailed godwit with 16,546 individuals representing an average of 13.7% of the population.
Species/populations identified subsequent to designation for possible future consideration under criterion 6 including species with peak counts in spring/autumn (ringed plover with 1,500 individuals [2%] and black-tailed godwit with 6,849 individuals [19.5%]) or with peak counts in winter (European golden plover with 22,033 individuals [2.3%] and northern lapwing with 46,422 individuals [1.3%]).</td></tr>
<tr><td>Current conservation status (Article 12):</td><td colspan="2">A037 Bewick's swan (winter) – short-term trend of population size: decreasing; long-term population size trend: decreasing.
A040 Pink-footed goose (winter) – short-term trend of population size: increasing; long-term population size trend: increasing.
A046a Dark-bellied brent goose (winter) – short-term trend of population size: stable; long-term population size trend: increasing.
A048 Common shelduck (winter) – short-term trend of population size: decreasing; long-term population size trend: stable.
A050 Wigeon (winter) – short-term trend of population size: stable; long-term population size trend: increasing.
A051 Gadwall (winter) – short-term trend of population size: increasing; long-term population size trend: increasing.
A054 Pintail (winter) – short-term trend of population size: decreasing; long-term population size trend: decreasing.</td></tr>
</table>

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)
	A065 Black scoter (winter) – short-term trend of population size: increasing; long-term population size trend: increasing. A067 Goldeneye (winter) – short-term trend of population size: decreasing; long-term population size trend: stable. A130 Eurasian oystercatcher (winter) – short-term trend of population size: stable; long-term population size trend: stable. A141 Grey plover (winter) – short-term trend of population size: stable; long-term population size trend: increasing. A143 Red knot (winter) – short-term trend of population size: stable; long-term population size trend: increasing. A144 Sanderling (winter) – short-term trend of population size: increasing; long-term population size trend: increasing. A149 Dunlin (winter) – short-term trend of population size: stable; long-term population size trend: decreasing. A156 Black-tailed godwit (winter) – short-term trend of population size: increasing; long-term population size trend: increasing. A157 Bar-tailed godwit (winter) – short-term trend of population size: stable; long-term population size trend: stable. A160 Eurasian curlew (winter) – short-term trend of population size: decreasing; long-term population size trend: increasing. A162 Common redshank (winter) – short-term trend of population size: decreasing; long-term population size trend: stable. A169 Ruddy turnstone (winter) – short-term trend of population size: decreasing; long-term population size trend: stable. A193 Common tern (breeding) – short-term trend of population size: decreasing; long-term population size trend: decreasing. A195 Little tern (breeding) – short-term trend of population size: decreasing; long-term population size trend: decreasing.
Conservation objectives:	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 the qualifying features • The structure and function of the habitats of the qualifying features • The supporting processes on which the habitats of the qualifying features rely • The population of each of the qualifying features, and, • The distribution of the qualifying features within the site.
SSSI condition assessment Taken from latest data in September 2025[172].	The Wash SSSI: 67.65% favourable, 8.82% unfavourable – recovering, 8.82% unfavourable – declining, 14.71% not recorded.
Site Improvement Plan (SIP)	1. Inappropriate water levels – A162 common redshank (NB) – Ensure the correct management of water levels in freshwater habitats. 6. Inappropriate coastal management – A193 common tern (B) – Respond to increased risk of tidal flooding on freshwater habitats. 15. Changes in species distributions – A195 little tern (B) – Consider options for habitat creation.

Potential effects		
Component	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Rutland Water)	The most likely proposed drought permit will take the form of a winter or summer authorisation to allow increased refilling of Rutland Water through a 50% reduction in the Minimum Residual Flow (MRF). It has been assumed that maximum abstractions (763Ml/d; 180,000Ml/yr)	**No**

[172] https://designatedsites.naturalengland.org.uk/

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)	
	would remain unchanged from those currently licensed, therefore the assessment is based on a reduction in MRF from 125Ml/d for December to April and 150Ml/d for May to November to 62.5Ml/d for December to April and 75Ml/d for May to November. This has been assessed as a major hydrological impact during summer and winter months. The Wansford Intake is located within an approximate 50km radius of The Wash SPA and within approximately 65km via hydrological connectivity (i.e. downstream of the River Nene). Potential impact pathways include reduced flow rates in the River Nene, water quality deterioration and increased siltation. This could have an impact on foraging habitat for all water dependant qualifying species in the SPA/Ramsar. **<u>SPA species features</u>:** **Article 4.1:** • **little tern (breeding)** • **common tern (breeding)** • **Bewick's swan (winter)** **Article 4.2:** • **Internationally and nationally important waterfowl assemblage including dark-bellied brent, pink-footed geese, shelduck, pintail, oystercatcher, grey plover, sanderling, knot, dunlin, bar-tailed godwit, curlew, redshank, turnstone.** **Construction** There is no construction phase associated with this drought action. **Operation** Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Wansford Intake have been assessed as major within the ZoI (Reaches 1 and 2) in either the summer or the winter. No hydrological assessment has been carried out within Reach 3, downstream of Dog-in-a-Doublet due to the tidal influence on river flows. As the tide cycle influence the water flow and its physico-chemical composition, it is considered that operation of the drought permit will have a minor impact, if any, within Reach 3 and subsequently within the SPA. Therefore, no LSEs are anticipated on the qualifying feature of The Wash SPA.	
	<u>Ramsar site species and habitat features</u>: **Ramsar criterion 1: large shallow bay with very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.** **Ramsar criterion 3: inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters.** **Ramsar criterion 5: assemblage of international importance.** **Ramsar criterion 6 (species/population occurring at levels of international importance)** • **Spring/autumn: Eurasian oystercatcher (winter), grey plover (wintering), red knot (wintering), sanderling, Eurasian curlew (breeding), common redshank and Ruddy turnstone.** • **Winter: pink-footed goose, dark-bellied brent goose, common shelduck, northern pintail, dunlin and bar-tailed godwit.** **Construction** There is no construction phase associated with this drought action.	

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)	
	Operation Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Wansford Intake have been assessed as major within the ZoI (Reaches 1 and 2) in either the summer or the winter. No hydrological assessment has been carried out within Reach 3, downstream of Dog-in-a-Doublet due to the tidal influence on river flows. As the tide cycle influence the water flow and its physico-chemical composition, it is considered that operation of the drought permit will have a minor impact, if any, within Reach 3 and subsequently within the Ramsar. Therefore, no LSEs are anticipated on the qualifying feature of The Wash Ramsar.	
River Nene (Pitsford)	**<u>SPA species features</u>:** **Article 4.1:** • **little tern (breeding)** • **common tern (breeding)** • **Bewick's swan (winter)** **Article 4.2:** • **Internationally and nationally important waterfowl assemblage including dark-bellied brent, pink-footed geese, shelduck, pintail, oystercatcher, grey plover, sanderling, knot, dunlin, bar-tailed godwit, curlew, redshank, turnstone.** **Construction** There is no construction phase associated with this drought action. **Operation** The qualifying features are considered water dependant. Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from WRCs and tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Duston Mill Intake will not extend as far downstream as The Wash SPA. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 6, which is upstream of The Wash SPA. Therefore, no LSEs are anticipated on the habitat features nor on common seal qualifying feature of The Wash SPA.	**No**
	<u>Ramsar site species and habitat features</u>: **Ramsar criterion 1: large shallow bay with very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.** **Ramsar criterion 3: inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters.** **Ramsar criterion 5: assemblage of international importance.** **Ramsar criterion 6 (species/population occurring at levels of international importance)** • **Spring/autumn: Eurasian oystercatcher (winter), grey plover (wintering), red knot (wintering), sanderling, Eurasian curlew (breeding), common redshank and Ruddy turnstone.** • **Winter: pink-footed goose, dark-bellied brent goose, common shelduck, northern pintail, dunlin and bar-tailed godwit.**	

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)	
	Construction There is no construction phase associated with this drought action. **Operation** Changes to freshwater flows due to the proposed drought permit will minimise with distance downstream from the abstraction points due to structural controls along the River Nene and the input of additional flow from WRCs and tributaries. Hydrological and physico-chemical changes in the River Nene as a result of a drought permit operation at Duston Mill Intake will not extend as far downstream as The Wash Ramsar. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that negligible impacts during the summer and winter permit are anticipated for Reach 6, which is upstream of The Wash Ramsar. Therefore, no LSEs are anticipated on the habitat features nor on common seal qualifying feature of The Wash Ramsar.	
River Gt Ouse (Grafham Water)	**<u>SPA species features</u>:** **Article 4.1:** • **little tern (breeding)** • **common tern (breeding)** • **Bewick's swan (winter)** **Article 4.2:** • **Internationally and nationally important waterfowl assemblage including dark-bellied brent, pink-footed geese, shelduck, pintail, oystercatcher, grey plover, sanderling, knot, dunlin, bar-tailed godwit, curlew, redshank, turnstone.** **Construction** There is no construction phase associated with this drought action. **Operation** A 50% reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Due to the distance between the intake and the SAC, changes in the flow regime or physio-chemical status to the extent of The Wash SPA is not anticipated. Freshwater input in the Ouse estuary is relatively low and minor importance in comparison to estuarine/marine processes. In addition, mean high water springs (the upper tidal limit) is located upstream resulting in considerable mixing of freshwater and saline water prior to reaching the SPA downstream. The impact of freshwater flow reductions on the SPA will be negligible due to the tidal nature of the SAP and the freshwater input from other rivers. Therefore, no LSEs are anticipated.	**No**
	<u>Ramsar site species and habitat features</u>: **Ramsar criterion 1: large shallow bay with very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.** **Ramsar criterion 3: inter-relationship between its various components including saltmarshes, intertidal sand and mud flats and the estuarine waters.** **Ramsar criterion 5: assemblage of international importance.** **Ramsar criterion 6 (species/population occurring at levels of international importance)** • **Spring/autumn: Eurasian oystercatcher (winter), grey plover (wintering), red knot (wintering), sanderling, Eurasian curlew (breeding), common redshank and Ruddy turnstone.** • **Winter: pink-footed goose, dark-bellied brent goose, common shelduck, northern pintail, dunlin and bar-tailed godwit.**	

Habitat site name:	The Wash SPA (UK9008021) and Ramsar site (UK9008041)	
	Construction There is no construction phase associated with this drought action. **Operation** A 50% reduction in minimal residual flow will reduce water flow immediately downstream of the intake along the River Great Ouse. Due to the distance between the intake and the Ramsar, changes in the flow regime or physio-chemical status to the extent of The Wash Ramsar is not anticipated. Freshwater input in the Ouse estuary is relatively low and minor importance in comparison to estuarine/marine processes. In addition, mean high water springs (the upper tidal limit) is located upstream resulting in considerable mixing of freshwater and saline water prior to reaching the Ramsar site downstream. The impact of freshwater flow reductions on the Ramsar site will be negligible due to the tidal nature of the Ramsar site and the freshwater input from other rivers. Therefore, no LSEs are anticipated.	

Table AN-24: Stage 1 Screening of Upper Nene Valley Gravel Pits SPA and Ramsar site

Habitat site name:	Upper Nene Valley Gravel Pits SPA (UK9020296) and Ramsar site (UK11083)	
Designation type and location	SPA and Ramsar site, SP79236013	**Water Dependent?** All features have been identified as water dependant
Qualifying features	**SPA** A021 *Botaurus stellaris*; Great bittern (Non-breeding) A051 *Anas strepera*; Gadwall (Non-breeding) A140 *Pluvialis apricaria*; European golden plover (Non-breeding) Waterbird assemblage	**Ramsar site** **Ramsar criterion 5** The site qualifies under Criterion 5 because it regularly supports 20,000 or more waterbirds: In the non-breeding season, the site regularly supports 23,821 individual waterbirds (5 year peak mean 1999/2000 – 2003/04). **Ramsar criterion 6 – species/populations occurring at levels of international importance.** The site qualifies under Criterion 6 because it regularly supports 1% of the individuals in the populations of the following species or subspecies of waterbird in any season: Mute swan *Cygnus olor*, 629 individuals – wintering, 5-year peak mean 1999/2000 – 2003/04. Gadwall *Anas strepera*, 773 individuals – wintering, 5-year peak mean 1999/2000 – 2003/04
Curent conservation status (JNCC,	**A021 *Botaurus stellaris*; Great bittern (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing **A140 *Pluvialis apricaria*; European golden plover (Non-breeding)** - short-term trend of population size: decreasing; long-term population size trend: increasing	

Habitat site name:	Upper Nene Valley Gravel Pits SPA (UK9020296) and Ramsar site (UK11083)	
2019, Article 17[173] and Article 12[174])	**A051 *Anas strepera*; Gadwall (Non-breeding)** - short-term trend of population size: increasing; long-term population size trend: increasing	
Conservation objectives:	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achie ving the aims of the Wild Birds Directive, by maintaining or restoring; The extent and distribution of the habitats of the qualifying features The structure and function of the habitats of the qualifying features The supporting processes on which the habitats of the qualifying features rely The population of each of the qualifying features, and, The distribution of the qualifying features within the site.	
SSSI Condition assessment (**Appendix 2** for detailed per unit)[175].	Upper Nene Valley Gravel Pits SSSI: 1.49% favourable, 48.48% unfavourable - recovering, 50.03% unfavourable - no change	
Site Improvement Plan (SIP)	1 Public Access/Disturbance - threat: A021(NB) Bittern, A051(NB) Gadwall, A140(NB) Golden Plover, Waterbird assemblage - Manage recreational impacts through access and habitat management and advice. 2 Planning Permission: general - Threat: A021(NB) Bittern, A051(NB) Gadwall, A140(NB) Golden Plover, Waterbird assemblage - Provide clear guidance to developers and local planning officers 3 Fisheries: Freshwater - threat: A021(NB) Bittern, A051(NB) Gadwall, A140(NB) Golden Plover, Waterbird assemblage - Maintain and develop sustainable freshwater fisheries, by developing individual Fisheries Plans 4 Change in land Natural England, Landowner(s) management - threat: A021(NB) Bittern, A051(NB) Gadwall, A140(NB) Golden Plover, Waterbird assemblage - Establish appropriate grazing and scrub management	
Potential effects		
Component	**Screening Assessment**	**Likely significant effect (LSE) alone?**
River Nene (Pitsford Water)	The maximum reduction in flow under the River Nene at Duston Mill drought permit is 17.05Ml/d, with the MRF in the Nene reduced from the baseline value of 34.1Ml/d to 17.05Ml/d. The River Nene (Pitsford Water) Drought Permit is within an approximate 7km radius of the Upper Nene Valley Gravel Pits SPA and Ramsar site and approximately within 7km via hydrological connectivity. **<u>SPA species features:</u> A021 *Botaurus stellaris*; Great bittern (Non-breeding), A051 *Anas strepera*; Gadwall (Non-breeding), A140 *Pluvialis apricaria*; European golden plover (Non-breeding),** **Construction** There is no construction phase associated with this drought action.	**No**

[173] JNCC, 2019b. *Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/
[174] JNCC, 2019. *Article 12 Birds Directive Report 2019: Species Conservation Status Assessments 2019*: https://jncc.gov.uk/our-work/article-12-report-2019/
[175] https://designatedsites.naturalengland.org.uk/ - accessed in July 2025.

Habitat site name:	Upper Nene Valley Gravel Pits SPA (UK9020296) and Ramsar site (UK11083)	
	Operation A review of the Upper Valley Gravel Pits SPA Supplementary Planning Document (SPD) identified that 'the most significant threats' to the SPA include recreational disturbance and therefore there is no potential cumulative effect with the implementation of the drought permit. The qualifying features are considered water dependant. The SPA is underpinned by the Upper Nene Gravel Pits SSSI which include nine units of which eight are considered in unfavourable condition either recovering or not changing) and one is of favourable condition. The condition of the unfavourable units is due to anthropogenic disturbance and inappropriate scrub control at the site. No in-combination effects with current pressures impacting on the SPA/ SSSI have been identified. Potential indirect impact pathways from the proposed drought permit are reduced water supply to hydrologically connected gravel pits, decreasing the extent of shallow foraging habitat and potential increases in nutrient concentrations with reduced dilution capacity of the associated waterbodies. The SPA is located alongside Reaches 2 and 3 of the River Nene, however it is considered that the SPA largely has no hydrological connectivity to the River Nene. It was previously determined that flows from the river only enters the lakes during high or flood flows. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that hydrological impacts are anticipated to be moderate within Reach 2 and minor within Reach 3. Therefore, the SPA and any hydrologically connected habitats that are functionally linked to qualifying species of the SPA and also water dependent could be impacted by reduced water supply. Clifford Hills gravel pits/ Northampton washlands and Earls Barton gravel pits (west) are the closest gravel pits downstream of the abstraction point. Both areas are used favourably for roosting and loafing by golden plover in particular. Water from the River Nene only enters these gravel pits during high or flood flows, with no continuous surface water hydrological connectivity. Therefore, no LSEs are anticipated at these gravel pits. Earls Barton gravel pits (central)/ Summer Leys Local Nature Reserve (LNR) is directly hydrologically connected via surface water to the River Nene. However, the site is located upstream of the River Nene and the grassland is noted as largely used for foraging by qualifying bird species, and negligible impacts from reduced flows downstream are anticipated. In addition, based on elevation maps the River Nene and Earls Barton gravel pits (central)/ Summer Leys LNR are at the same elevation; 45m elevation (5m contours) therefore, it is viewed as unlikely that lower flows in the River Nene will encourage flows from the upstream SPA, downstream. Potential functionally linked habitats that could be impacted by the proposed drought permit include Storton's Pit LNR, which is located on the left bank of the River Nene approximately 200m downstream of the abstraction point. The site includes gravel pits, a fen ditch and an area of wet meadow. Based on WeBS counts from 19/20 – 23/24, gadwall, tufted duck and some main component species of the bird assemblages of the SPA have been recorded at the site. Although some hydrological connectivity is anticipated between the River Nene and Storton's Pit LNR, the main water supply through the LNR is provided on the northern edge via a storm water outflow. Therefore, no LSEs are anticipated as a result of the drought permit. Another potentially functionally linked habitat that could be impacted by the proposed drought permit is Barnes Meadow LNR. It includes lowland fen priority habitat with a variety of ditches and shallow scrapes and therefore, could support waterbird species. No WeBS counts have been conducted at the site and no qualifying features are mentioned in the site description to suggest that the site forms functionally linked habitat for qualifying bird species. As no changes to baseline groundwater conditions are expected as a result of the drought permit (see Section D4.2 and Appendix A of the EAR for River Nene (Pitsford Water)), impacts to the Barnes Meadow LNR will be limited to habitats within the immediate vicinity of the River Nene. On the basis that lowland fen priority habitat is approximately 40m from the River Nene main channel, no LSE are anticipated from the drought permit on key habitats that could support qualifying bird species. From Unit 4 of the Upper Nene Gravel Pits SSSI onwards (downstream), minor hydrological impacts are anticipated (see Section D4.2 and Appendix A of the EAR, Reach 3) and therefore, the screening assessment has concluded no LSEs on qualifying bird species and supporting habitat.	

Habitat site name:	Upper Nene Valley Gravel Pits SPA (UK9020296) and Ramsar site (UK11083)	
	Ramsar site species features: Gadwall, *Anas strepera* (Wintering); Mute swan, *Cygnus olor* (Wintering); Waterbird assemblage – Wintering **Construction** There is no construction phase associated with this drought action. **Operation** A review of the Upper Valley Gravel Pits SPA Supplementary Planning Document (SPD) which also refers to the Ramsar site, identified that 'the most significant threats' to the Ramsar include recreational disturbance and therefore there is no potential cumulative effect with the implementation of the drought permit. The qualifying features are considered water dependant. The Ramsar is also underpinned by the Upper Nene Gravel Pits SSSI which include nine units of which eight are considered in unfavourable condition either recovering or not changing) and one is of favourable condition. The condition of the unfavourable units is due to anthropogenic disturbance and inappropriate scrub control at the site. No in-combination effects with current pressures impacting on the Ramsar/ SSSI have been identified. Potential indirect impact pathways from the proposed drought permit are reduced water supply to hydrologically connected gravel pits, decreasing the extent of shallow foraging habitat and potential increases in nutrient concentrations with reduced dilution capacity of the associated waterbodies. The Ramsar is located alongside Reaches 2 and 3 of the River Nene, however it is considered that the Ramsar largely has no hydrological connectivity to the River Nene. It was previously determined that flows from the river only enters the lakes during high or flood flows. The Ramsar is defined as a flood water storage within the Ramsar citation. The hydrological impact assessment for the River Nene (Pitsford water) Drought Permit concluded that hydrological impacts are anticipated to be moderate within Reach 2 and minor within Reach 3. Therefore, the Ramsar and any hydrologically connected habitats that are functionally linked to qualifying species of the Ramsar and also water dependent could be impacted by reduced water supply. Clifford Hills gravel pits/ Northampton washlands and Earls Barton gravel pits (west) are the closest gravel pits downstream of the abstraction point. Both areas are used favourably for roosting and loafing by golden plover in particular. Water from the River Nene only enters these gravel pits during high or flood flows, with no continuous surface water hydrological connectivity. Therefore, no LSEs are anticipated at these gravel pits. Earls Barton gravel pits (central)/ Summer Leys LNR is directly hydrologically connected via surface water to the River Nene. However, the site is located upstream of the River Nene and the grassland is noted as largely used for foraging by qualifying bird species, and negligible impacts from reduced flows downstream are anticipated. In addition, based on elevation maps the River Nene and Earls Barton gravel pits (central)/ Summer Leys LNR are at the same elevation; 45m elevation (5m contours) therefore, it is viewed as unlikely that lower flows in the River Nene will encourage flows from the upstream Ramsar, downstream. Potential functionally linked habitats that could be impacted by the proposed drought permit include Storton's Pit LNR, which is located on the left bank of the River Nene approximately 200m downstream of the abstraction point. The site includes gravel pits, a fen ditch and an area of wet meadow. Based on WeBS counts from 19/20 – 23/24, gadwall, mute swan and some main component species of the bird assemblages of the Ramsar have been recorded at the site. Although some hydrological connectivity is anticipated between the River Nene and Storton's Pit LNR, the main water supply through the LNR is provided on the northern edge via a storm water outflow. Therefore, no LSEs are anticipated as a result of the drought permit. Another potentially functionally linked habitat that could be impacted by the proposed drought permit is Barnes Meadow LNR. It includes lowland fen priority habitat with a variety of ditches and shallow scrapes and therefore, could support waterbird species. No WeBS counts have been conducted at the site and no qualifying features are mentioned in the site description to suggest that the site forms functionally linked habitat for qualifying bird species. As no changes to baseline groundwater conditions are expected as a result of the drought permit (see Section D4.2 and Appendix A of the EAR for River Nene (Pitsford Water)), impacts to the Barnes Meadow LNR will be limited to habitats within the	**No**

Habitat site name:	Upper Nene Valley Gravel Pits SPA (UK9020296) and Ramsar site (UK11083)	
	immediate vicinity of the River Nene. On the basis that lowland fen priority habitat is approximately 40m from the River Nene main channel, no LSE are anticipated from the drought permit on key habitats that could support qualifying bird species. From Unit 4 of the Upper Nene Gravel Pits SSSI onwards (downstream), minor hydrological impacts are anticipated (see Section D4.2 and Appendix A of the EAR, Reach 3) and therefore, the screening assessment has concluded no LSEs on qualifying bird species and supporting habitat.	

ANNEX-2: SSSI DETAILED CONDITION DATA

Table AN- 25: SSSI Detailed condition data

SSSI	Unit	Condition	Habitat
Abberton Reservoir SSSI	001	Unfavourable - Declining	Standing Open Water And Canals
	002	Unfavourable - Declining	Standing Open Water And Canals
	003	Unfavourable - Declining	Standing Open Water And Canals
Adventurers' Land SSSI	001	Favourable	Earth Heritage
Alderfen Broad SSSI	001	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - Recovering	Standing Open Water And Canals
Ant Broads and Marshes SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Favourable	Fen, Marsh And Swamp - Lowland
	006	Favourable	Fen, Marsh And Swamp - Lowland
	007	Favourable	Fen, Marsh And Swamp - Lowland
	008	Favourable	Fen, Marsh And Swamp - Lowland
	009	Favourable	Fen, Marsh And Swamp - Lowland
	010	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	011	Favourable	Fen, Marsh And Swamp - Lowland
	012	Favourable	Fen, Marsh And Swamp - Lowland
	013	Favourable	Fen, Marsh And Swamp - Lowland
	016	Favourable	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
	017	Favourable	Fen, Marsh And Swamp - Lowland
	018	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	019	Favourable	Fen, Marsh And Swamp - Lowland
	020	Favourable	Fen, Marsh And Swamp - Lowland
	021	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	022	Favourable	Fen, Marsh And Swamp - Lowland
	023	Favourable	Fen, Marsh And Swamp - Lowland
	024	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	025	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	026	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	027	Favourable	Fen, Marsh And Swamp - Lowland
	028	Favourable	Fen, Marsh And Swamp - Lowland
	029	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	030	Favourable	Fen, Marsh And Swamp - Lowland
	031	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	032	Favourable	Fen, Marsh And Swamp - Lowland
	033	Unfavourable - Recovering	Standing Open Water And Canals
	034	Favourable	Standing Open Water And Canals
	035	Unfavourable - Recovering	Standing Open Water And Canals
	036	Unfavourable - Declining	Standing Open Water And Canals
	037	Favourable	Standing Open Water And Canals
Badley Moor SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Favourable	Fen, Marsh And Swamp - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
Barnack Hills & Holes SSSI	001	Favourable	Calcareous Grassland - Lowland
Barnby Broad & Marshes SSSI	001	Favourable	Neutral Grassland - Lowland
	002	Favourable	Neutral Grassland - Lowland
	003	Unfavourable - Recovering	Neutral Grassland - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	006	Favourable	Neutral Grassland - Lowland
	007	Unfavourable - Recovering	Neutral Grassland - Lowland
	008	Unfavourable - Recovering	Neutral Grassland - Lowland
	009	Unfavourable - Recovering	Neutral Grassland - Lowland
	010	Unfavourable - Recovering	Neutral Grassland - Lowland
	011	Favourable	Neutral Grassland - Lowland
	012	Favourable	Fen, Marsh And Swamp - Lowland
	013	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	014	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	015	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	016	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	017	Unfavourable - Recovering	Neutral Grassland - Lowland
	018	Unfavourable - Recovering	Neutral Grassland - Lowland
	020	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	021	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	022	Unfavourable - Recovering	Standing Open Water And Canals
	023	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
	024	Unfavourable - Recovering	Neutral Grassland - Lowland
	025	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Barnhamcross Common SSSI	001	Unfavourable - No change	Calcareous Grassland - Lowland
	002	Unfavourable - Recovering	Calcareous Grassland - Lowland
Barnham Heath SSSI	002	Unfavourable - Recovering	Neutral Grassland - Lowland
	004	Favourable	Acid Grassland - Lowland
Berner's Heath, Icklingham SSSI	006	Destroyed	Dwarf Shrub Heath - Lowland
	007	Destroyed	Dwarf Shrub Heath - Lowland
	008	Favourable	Dwarf Shrub Heath - Lowland
Blackwater Estuary SSSI	001	Unfavourable - Recovering	Littoral Sediment
	002	Unfavourable - Recovering	Littoral Sediment
	003	Unfavourable - Recovering	Littoral Sediment
	004	Unfavourable - Recovering	Littoral Sediment
	005	Favourable	Neutral Grassland - Lowland
	006	Unfavourable - Recovering	Littoral Sediment
	007	Unfavourable - Recovering	Littoral Sediment
	008	Unfavourable - Recovering	Littoral Sediment
	009	Unfavourable - Recovering	Littoral Sediment
	010	Unfavourable - Recovering	Littoral Sediment
	011	Unfavourable - Recovering	Littoral Sediment
	012	Unfavourable - Recovering	Littoral Sediment
	013	Unfavourable - Recovering	Littoral Sediment
	014	Favourable	Neutral Grassland - Lowland
	015	Favourable	Inshore Sublittoral Sediment - Cl
	016	Favourable	Fen, Marsh And Swamp - Lowland
	017	Favourable	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	018	Unfavourable - Recovering	Littoral Sediment
	019	Unfavourable - Recovering	Littoral Sediment
	020	Unfavourable - Recovering	Littoral Sediment
	021	Favourable	Neutral Grassland - Lowland
	022	Favourable	Neutral Grassland - Lowland
	023	Favourable	Neutral Grassland - Lowland
	024	Favourable	Neutral Grassland - Lowland
	025	Unfavourable - Recovering	Littoral Sediment
	026	Unfavourable - Recovering	Littoral Sediment
	027	Unfavourable - Recovering	Littoral Sediment
	028	Unfavourable - Recovering	Littoral Sediment
	029	Unfavourable - Recovering	Littoral Sediment
	030	Unfavourable - Recovering	Littoral Sediment
	031	Unfavourable - Recovering	Littoral Sediment
	032	Unfavourable - Recovering	Littoral Sediment
	033	Unfavourable - Recovering	Littoral Sediment
	034	Favourable	Neutral Grassland - Lowland
	035	Favourable	Neutral Grassland - Lowland
	036	Unfavourable - Recovering	Littoral Sediment
	037	Unfavourable - Recovering	Littoral Sediment
	038	Unfavourable - Recovering	Littoral Sediment
	039	Unfavourable - Recovering	Littoral Sediment
	040	Unfavourable - Recovering	Littoral Sediment
	041	Favourable	Neutral Grassland - Lowland
	042	Favourable	Neutral Grassland - Lowland
	043	Favourable	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	044	Unfavourable - Recovering	Littoral Sediment
	045	Unfavourable - Declining	Littoral Sediment
	046	Favourable	Littoral Sediment
	047	Unfavourable - Declining	Littoral Sediment
	048	Unfavourable - Recovering	Littoral Sediment
	049	Unfavourable - Recovering	Littoral Sediment
	050	Unfavourable - Recovering	Littoral Sediment
	051	Unfavourable - Recovering	Littoral Sediment
	052	Unfavourable - Recovering	Littoral Sediment
	053	Unfavourable - Recovering	Littoral Sediment
	054	Unfavourable - Recovering	Littoral Sediment
	055	Unfavourable - Recovering	Littoral Sediment
	056	Unfavourable - Recovering	Littoral Sediment
	057	Unfavourable - Recovering	Littoral Sediment
	058	Unfavourable - Recovering	Littoral Sediment
	059	Unfavourable - Recovering	Littoral Sediment
	060	Unfavourable - Recovering	Littoral Sediment
	061	Unfavourable - Recovering	Littoral Sediment
	062	Unfavourable - Recovering	Littoral Sediment
	063	Unfavourable - Recovering	Littoral Sediment
	064	Unfavourable - Recovering	Littoral Sediment
	065	Unfavourable - Recovering	Littoral Sediment
	066	Favourable	Neutral Grassland - Lowland
	067	Unfavourable - Recovering	Littoral Sediment
	068	Unfavourable - Recovering	Littoral Sediment
	069	Unfavourable - Recovering	Littoral Sediment

SSSI	Unit	Condition	Habitat
	070	Unfavourable - Recovering	Littoral Sediment
	071	Favourable	Littoral Sediment
	072	Favourable	Fen, Marsh And Swamp - Lowland
	073	Favourable	Neutral Grassland - Lowland
	074	Unfavourable - Recovering	Littoral Sediment
	075	Unfavourable - Recovering	Littoral Sediment
	076	Unfavourable - Recovering	Littoral Sediment
	077	Unfavourable - Recovering	Littoral Sediment
	079	Favourable	Neutral Grassland - Lowland
	080	Favourable	Boundary And Linear Features
	081	Partially destroyed	Neutral Grassland - Lowland
	082	Favourable	Neutral Grassland - Lowland
	083	Favourable	Neutral Grassland - Lowland
	084	Favourable	Neutral Grassland - Lowland
	085	Favourable	Neutral Grassland - Lowland
	086	Favourable	Neutral Grassland - Lowland
	087	Favourable	Neutral Grassland - Lowland
	088	Favourable	Littoral Sediment
	089	Favourable	Neutral Grassland - Lowland
Booton Common SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Breckland Farmland SSSI	001	Unfavourable - Declining	Arable And Horticulture
	002	Unfavourable - Declining	Arable And Horticulture
	003	Unfavourable - Declining	Arable And Horticulture
	004	Unfavourable - Declining	Arable And Horticulture
	005	Unfavourable - Declining	Arable And Horticulture
	006	Unfavourable - Declining	Arable And Horticulture

SSSI	Unit	Condition	Habitat
	007	Unfavourable - Declining	Arable And Horticulture
	008	Unfavourable - Declining	Arable And Horticulture
	009	Unfavourable - Declining	Arable And Horticulture
	010	Unfavourable - Declining	Arable And Horticulture
	011	Unfavourable - Declining	Arable And Horticulture
	012	Unfavourable - Declining	Arable And Horticulture
	013	Unfavourable - Declining	Arable And Horticulture
	014	Unfavourable - Declining	Arable And Horticulture
	015	Unfavourable - Declining	Arable And Horticulture
	016	Unfavourable - Declining	Arable And Horticulture
	017	Unfavourable - Declining	Arable And Horticulture
	018	Unfavourable - Declining	Arable And Horticulture
	019	Unfavourable - Declining	Arable And Horticulture
	020	Unfavourable - Declining	Arable And Horticulture
	021	Unfavourable - Declining	Arable And Horticulture
	022	Unfavourable - Declining	Arable And Horticulture
	023	Unfavourable - Declining	Arable And Horticulture
	024	Unfavourable - Declining	Arable And Horticulture
	025	Unfavourable - Declining	Arable And Horticulture
	026	Unfavourable - Declining	Arable And Horticulture
	027	Unfavourable - Declining	Arable And Horticulture
	028	Unfavourable - Declining	Arable And Horticulture
	029	Unfavourable - Declining	Arable And Horticulture
	030	Unfavourable - Declining	Arable And Horticulture
	031	Unfavourable - Declining	Arable And Horticulture
	032	Unfavourable - Declining	Arable And Horticulture

SSSI	Unit	Condition	Habitat
	033	Unfavourable - Declining	Arable And Horticulture
	034	Unfavourable - Declining	Arable And Horticulture
	035	Unfavourable - Declining	Arable And Horticulture
	036	Unfavourable - Declining	Arable And Horticulture
	037	Unfavourable - Declining	Arable And Horticulture
	038	Unfavourable - Declining	Arable And Horticulture
	039	Unfavourable - Declining	Arable And Horticulture
	040	Unfavourable - Declining	Arable And Horticulture
	041	Unfavourable - Declining	Arable And Horticulture
	042	Unfavourable - Declining	Arable And Horticulture
	043	Unfavourable - Declining	Arable And Horticulture
	044	Unfavourable - Declining	Arable And Horticulture
	045	Unfavourable - Declining	Arable And Horticulture
	046	Unfavourable - Declining	Arable And Horticulture
	047	Unfavourable - Declining	Arable And Horticulture
	048	Unfavourable - Declining	Arable And Horticulture
	049	Unfavourable - Declining	Arable And Horticulture
	050	Unfavourable - Declining	Arable And Horticulture
	051	Unfavourable - Declining	Arable And Horticulture
	052	Unfavourable - Declining	Arable And Horticulture
	053	Unfavourable - Declining	Arable And Horticulture
	054	Unfavourable - Declining	Arable And Horticulture
	055	Unfavourable - Declining	Arable And Horticulture
	056	Unfavourable - Declining	Arable And Horticulture
	057	Unfavourable - Declining	Arable And Horticulture
	058	Unfavourable - Declining	Arable And Horticulture

SSSI	Unit	Condition	Habitat
	059	Unfavourable - Declining	Arable And Horticulture
	060	Unfavourable - Declining	Arable And Horticulture
	061	Unfavourable - Declining	Arable And Horticulture
	062	Unfavourable - Declining	Arable And Horticulture
	063	Unfavourable - Declining	Arable And Horticulture
	064	Unfavourable - Declining	Arable And Horticulture
	065	Unfavourable - Declining	Arable And Horticulture
	066	Unfavourable - Declining	Arable And Horticulture
	067	Unfavourable - Declining	Arable And Horticulture
	068	Unfavourable - Declining	Arable And Horticulture
	069	Unfavourable - Declining	Arable And Horticulture
	070	Unfavourable - Declining	Arable And Horticulture
Breckland Forest SSSI	001	Unfavourable - Recovering	Coniferous Woodland
	002	Unfavourable - Recovering	Coniferous Woodland
	003	Unfavourable - Recovering	Coniferous Woodland
	004	Unfavourable - Recovering	Coniferous Woodland
	005	Favourable	Earth Heritage
	006	Favourable	Earth Heritage
	007	Favourable	Earth Heritage
Breydon Water SSSI	001	Favourable	Littoral Sediment
	002	Favourable	Neutral Grassland - Lowland
	003	Favourable	Neutral Grassland - Lowland
	004	Favourable	Neutral Grassland - Lowland
	005	Favourable	Littoral Sediment
	006	Favourable	Littoral Sediment
	007	Favourable	Littoral Sediment

SSSI	Unit	Condition	Habitat
	008	Favourable	Neutral Grassland - Lowland
	009	Favourable	Littoral Sediment
	010	Favourable	Neutral Grassland - Lowland
	011	Favourable	Neutral Grassland - Lowland
	012	Favourable	Neutral Grassland - Lowland
	013	Favourable	Neutral Grassland - Lowland
	014	Favourable	Neutral Grassland - Lowland
	015	Favourable	Littoral Sediment
Bridgham & Brettenham Heaths SSSI	001	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	002	Unfavourable - Recovering	Acid Grassland - Lowland
	003	Unfavourable - Recovering	Acid Grassland - Lowland
	004	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	005	Favourable	Acid Grassland - Lowland
	006	Favourable	Calcareous Grassland - Lowland
Broad Fen, Dilham SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Bure Broads and Marshes SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	003	Favourable	Fen, Marsh And Swamp - Lowland
	004	Unfavourable - No change	Standing Open Water And Canals
	005	Favourable	Fen, Marsh And Swamp - Lowland
	006	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	007	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	008	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	009	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Unfavourable - Recovering	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	011	Unfavourable - No change	Standing Open Water And Canals
	012	Unfavourable - No change	Standing Open Water And Canals
	013	Unfavourable - Recovering	Standing Open Water And Canals
	014	Favourable	Standing Open Water And Canals
Burgh Common and Muckfleet Marshes SSSI	001	Unfavourable - No change	Standing Open Water And Canals
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - No change	Standing Open Water And Canals
	004	Unfavourable - No change	Standing Open Water And Canals
	005	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	006	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	007	Unfavourable - No change	Standing Open Water And Canals
	008	Unfavourable - Recovering	Standing Open Water And Canals
	009	Favourable	Standing Open Water And Canals
Buxton Heath SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Calthorpe Broad SSSI	001	Favourable	Acid Grassland - Lowland
	002	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	003	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Cantley Marshes SSSI	001	Unfavourable - Declining	Standing Open Water And Canals
	002	Unfavourable - Declining	Broadleaved, Mixed And Yew Woodland - Lowland
	003	Favourable	Standing Open Water And Canals
Cavenham - Icklingham Heaths SSSI	001	Unfavourable - Recovering	Acid Grassland - Lowland
	002	Unfavourable - No change	Acid Grassland - Lowland
	003	Favourable	Acid Grassland - Lowland
	004	Unfavourable - No change	Acid Grassland - Lowland
	005	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
	006	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	007	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	011	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	012	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	013	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	014	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	015	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	016	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	017	Unfavourable - Recovering	Acid Grassland - Lowland
	018	Unfavourable - No change	Acid Grassland - Lowland
	019	Unfavourable - Recovering	Acid Grassland - Lowland
	020	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	021	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	022	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	023	Destroyed	Acid Grassland - Lowland
	024	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	025	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	026	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland

SSSI	Unit	Condition	Habitat
	029	Unfavourable - No change	Acid Grassland - Lowland
	031	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	032	Favourable	Fen, Marsh And Swamp - Lowland
Colne Estuary SSSI	001	Unfavourable - Recovering	Littoral Sediment
	002	Favourable	Earth Heritage
	003	Unfavourable - Recovering	Littoral Sediment
	004	Favourable	Improved Grassland
	005	Unfavourable - Recovering	Littoral Sediment
	006	Unfavourable - Recovering	Littoral Sediment
	007	Unfavourable - Recovering	Littoral Sediment
	008	Favourable	Neutral Grassland - Lowland
	009	Unfavourable - Recovering	Littoral Sediment
	010	Favourable	Fen, Marsh And Swamp - Lowland
	011	Unfavourable - Recovering	Neutral Grassland - Lowland
	012	Unfavourable - Declining	Boundary And Linear Features
	013	Favourable	Improved Grassland
	014	Unfavourable - Recovering	Littoral Sediment
	015	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	016	Unfavourable - Recovering	Littoral Sediment
	017	Unfavourable - Recovering	Littoral Sediment
	018	Unfavourable - Recovering	Littoral Sediment
	019	Favourable	Fen, Marsh And Swamp - Lowland
	020	Unfavourable - Recovering	Littoral Sediment
	021	Unfavourable - Recovering	Littoral Sediment
	022	Favourable	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	023	Unfavourable - Recovering	Littoral Sediment
	024	Favourable	Neutral Grassland - Lowland
	025	Favourable	Neutral Grassland - Lowland
	026	Favourable	Neutral Grassland - Lowland
	027	Unfavourable - Recovering	Littoral Sediment
	028	Unfavourable - Recovering	Littoral Sediment
	029	Unfavourable - Recovering	Littoral Sediment
	030	Unfavourable - Recovering	Littoral Sediment
	031	Favourable	Neutral Grassland - Lowland
	032	Favourable	Neutral Grassland - Lowland
	033	Unfavourable - Recovering	Littoral Sediment
	035	Unfavourable - Recovering	Littoral Sediment
	036	Unfavourable - Recovering	Littoral Sediment
	037	Unfavourable - Recovering	Littoral Sediment
	038	Favourable	Boundary And Linear Features
	039	Unfavourable - Recovering	Littoral Sediment
	040	Unfavourable - Recovering	Littoral Sediment
	041	Unfavourable - Recovering	Littoral Sediment
	043	Favourable	Earth Heritage
	044	Favourable	Littoral Sediment
	045	Favourable	Littoral Sediment
Coston Fen, Runhall SSSI	001	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
Cranberry Rough Hockham SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	004	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
Cranwich Camp SSSI	001	Unfavourable - Recovering	Calcareous Grassland - Lowland
Crostwick Marsh SSSI	001	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
Crouch and Roach Estuaries SSSI	001	Unfavourable - Recovering	Littoral Sediment
	002	Unfavourable - Recovering	Littoral Sediment
	003	Unfavourable - Recovering	Littoral Sediment
	004	Unfavourable - Recovering	Littoral Sediment
	005	Unfavourable - Recovering	Littoral Sediment
	006	Favourable	Improved Grassland
	007	Unfavourable - Recovering	Littoral Sediment
	008	Unfavourable - Recovering	Littoral Sediment
	009	Unfavourable - Recovering	Littoral Sediment
	010	Favourable	Neutral Grassland - Lowland
	011	Unfavourable - Recovering	Littoral Sediment
	012	Favourable	Standing Open Water And Canals
	013	Favourable	Improved Grassland
	014	Unfavourable - Recovering	Littoral Sediment
	015	Favourable	Littoral Sediment
	016	Favourable	Neutral Grassland - Lowland
	017	Unfavourable - Recovering	Littoral Sediment
	018	Favourable	Improved Grassland
	019	Unfavourable - Recovering	Littoral Sediment
	020	Favourable	Improved Grassland
	021	Favourable	Inshore Sublittoral Sediment - Cl
	022	Unfavourable - Recovering	Littoral Sediment
	023	Favourable	Inshore Sublittoral Sediment - Cl
	024	Unfavourable - Recovering	Littoral Sediment

SSSI	Unit	Condition	Habitat
	025	Favourable	Improved Grassland
	026	Unfavourable - Recovering	Littoral Sediment
	027	Favourable	Improved Grassland
	028	Unfavourable - Recovering	Littoral Sediment
	029	Unfavourable - Recovering	Littoral Sediment
	030	Unfavourable - Recovering	Littoral Sediment
	031	Unfavourable - Recovering	Littoral Sediment
	032	Unfavourable - Recovering	Littoral Sediment
	033	Unfavourable - Recovering	Littoral Sediment
	034	Unfavourable - Recovering	Littoral Sediment
	035	Unfavourable - Recovering	Littoral Sediment
	036	Unfavourable - Recovering	Littoral Sediment
	037	Unfavourable - Recovering	Littoral Sediment
	038	Unfavourable - Recovering	Littoral Sediment
	039	Unfavourable - Recovering	Littoral Sediment
	040	Favourable	Improved Grassland
	041	Unfavourable - Recovering	Littoral Sediment
	042	Favourable	Inshore Sublittoral Sediment - Cl
	043	Unfavourable - Recovering	Littoral Sediment
	044	Unfavourable - Recovering	Littoral Sediment
	045	Unfavourable - Recovering	Littoral Sediment
	046	Unfavourable - Recovering	Littoral Sediment
	047	Unfavourable - Recovering	Littoral Sediment
	048	Unfavourable - Recovering	Littoral Sediment
	049	Unfavourable - Recovering	Littoral Sediment
	050	Unfavourable - Recovering	Littoral Sediment

SSSI	Unit	Condition	Habitat
	051	Favourable	Standing Open Water And Canals
	052	Unfavourable - Recovering	Littoral Sediment
	053	Unfavourable - Recovering	Littoral Sediment
	054	Unfavourable - Recovering	Littoral Sediment
	055	Unfavourable - No change	Neutral Grassland - Lowland
	056	Unfavourable - Recovering	Littoral Sediment
	057	Unfavourable - Recovering	Littoral Sediment
	058	Favourable	Inshore Sublittoral Sediment - Cl
	059	Favourable	Neutral Grassland - Lowland
	060	Favourable	Inshore Sublittoral Sediment - Cl
Damgate Marshes, Acle SSSI	001	Unfavourable - Recovering	Standing Open Water And Canals
	002	Unfavourable - Recovering	Standing Open Water And Canals
	003	Favourable	Standing Open Water And Canals
	004	Unfavourable - Recovering	Standing Open Water And Canals
	005	Favourable	Standing Open Water And Canals
	006	Favourable	Standing Open Water And Canals
	007	Unfavourable - Recovering	Standing Open Water And Canals
	008	Favourable	Standing Open Water And Canals
	009	Favourable	Standing Open Water And Canals
	010	Favourable	Standing Open Water And Canals
Deadman's Grave, Icklingham SSSI	001	Unfavourable - Declining	Calcareous Grassland - Lowland
	002	Unfavourable - Recovering	Calcareous Grassland - Lowland
	003	Unfavourable - Recovering	Calcareous Grassland - Lowland
	004	Unfavourable - Declining	Calcareous Grassland - Lowland
	005	Unfavourable - Declining	Calcareous Grassland - Lowland
	007	Unfavourable - Recovering	Calcareous Grassland - Lowland

SSSI	Unit	Condition	Habitat
Decoy Carr, Acle SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	003	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	005	Favourable	Fen, Marsh And Swamp - Lowland
	006	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	007	Favourable	Fen, Marsh And Swamp - Lowland
Dengie SSSI	001	Unfavourable - Declining	Littoral Sediment
	002	Unfavourable - Declining	Littoral Sediment
	003	Unfavourable - Declining	Littoral Sediment
	004	Unfavourable - Recovering	Littoral Sediment
	005	Unfavourable - Recovering	Littoral Sediment
	006	Unfavourable - Recovering	Littoral Sediment
	007	Unfavourable - Recovering	Littoral Sediment
	008	Unfavourable - Recovering	Littoral Sediment
Ducan's Marsh, Claxton SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
East Walton and Adcock's Common SSSI	001	Unfavourable - Recovering	Calcareous Grassland - Lowland
	002	Unfavourable - Recovering	Calcareous Grassland - Lowland
	003	Unfavourable - Recovering	Neutral Grassland - Lowland
East Wretham Heath SSSI	001	Unfavourable - Recovering	Acid Grassland - Lowland
	002	Unfavourable - Recovering	Acid Grassland - Lowland
	003	Unfavourable - Recovering	Neutral Grassland - Lowland
	004	Favourable	Neutral Grassland - Lowland
	005	Unfavourable - Declining	Standing Open Water And Canals
	006	Unfavourable - Recovering	Acid Grassland - Lowland

SSSI	Unit	Condition	Habitat
Eriswell Low Warren SSSI	001	Favourable	Acid Grassland - Lowland
Field Barn Heaths, Hilborough SSSI	001	Unfavourable - Recovering	Calcareous Grassland - Lowland
Flordon Common SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
Foulden Common SSS	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	004	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	005	Unfavourable - Recovering	Neutral Grassland - Lowland
	006	Favourable	Calcareous Grassland - Lowland
	008	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Foulness SSSI	001	Favourable	Neutral Grassland - Lowland
	002	Unfavourable - Recovering	Littoral Sediment
	003	Unfavourable - Declining	Littoral Sediment
	004	Unfavourable - Recovering	Neutral Grassland - Lowland
	005	Unfavourable - Recovering	Littoral Sediment
	006	Unfavourable - Recovering	Neutral Grassland - Lowland
	007	Unfavourable - Recovering	Neutral Grassland - Lowland
	008	Unfavourable - Recovering	Neutral Grassland - Lowland
	009	Unfavourable - Recovering	Improved Grassland
	010	Unfavourable - Recovering	Neutral Grassland - Lowland
	011	Unfavourable - Recovering	Neutral Grassland - Lowland
	012	Unfavourable - Recovering	Improved Grassland
	013	Favourable	Inshore Sublittoral Sediment - Cl
	014	Unfavourable - Recovering	Littoral Sediment

SSSI	Unit	Condition	Habitat
	015	Favourable	Inshore Sublittoral Sediment - Cl
	016	Favourable	Neutral Grassland - Lowland
	017	Unfavourable - Recovering	Littoral Sediment
	018	Unfavourable - Declining	Neutral Grassland - Lowland
	019	Unfavourable - Recovering	Littoral Sediment
	020	Unfavourable - Recovering	Neutral Grassland - Lowland
	021	Favourable	Littoral Sediment
	022	Unfavourable - Recovering	Littoral Sediment
	023	Favourable	Littoral Sediment
	024	Unfavourable - Recovering	Littoral Sediment
	025	Favourable	Neutral Grassland - Lowland
	026	Unfavourable - Recovering	Littoral Sediment
	027	Favourable	Neutral Grassland - Lowland
	028	Unfavourable - Recovering	Littoral Sediment
	029	Unfavourable - Recovering	Littoral Sediment
	030	Favourable	Neutral Grassland - Lowland
	031	Unfavourable - Recovering	Littoral Sediment
	032	Unfavourable - Recovering	Supralittoral Sediment
	033	Unfavourable - Recovering	Littoral Sediment
	035	Unfavourable - No change	Supralittoral Sediment
Foxhole Heath, Eriswell SSSI	001	Favourable	Calcareous Grassland - Lowland
Geldeston Meadows SSSI	001	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Declining	Standing Open Water And Canals
Gibraltar Point SSSI	001	Unfavourable - Recovering	Supralittoral Sediment
	002	Favourable	Littoral Sediment
	003	Unfavourable - Declining	Supralittoral Sediment

SSSI	Unit	Condition	Habitat
	004	Unfavourable - Recovering	Littoral Sediment
	005	Favourable	Earth Heritage
Gooderstone Warren SSSI	001	Unfavourable - Recovering	Calcareous Grassland - Lowland
	002	Unfavourable - Recovering	Acid Grassland - Lowland
	003	Unfavourable - Recovering	Calcareous Grassland - Lowland
	004	Unfavourable - Recovering	Acid Grassland - Lowland
Great Cressingham Fen SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Grime's Graves SSSI	001	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	002	Favourable	Acid Grassland - Lowland
	003	Unfavourable - Recovering	Calcareous Grassland - Lowland
Hall Farm Fen, Hemsby SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
Halvergate Marshes SSSI	001	Favourable	Standing Open Water And Canals
	002	Unfavourable - No change	Standing Open Water And Canals
	003	Favourable	Standing Open Water And Canals
	004	Favourable	Standing Open Water And Canals
	005	Favourable	Standing Open Water And Canals
	006	Favourable	Standing Open Water And Canals
	008	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	009	Unfavourable - No change	Standing Open Water And Canals
	010	Favourable	Standing Open Water And Canals
	011	Unfavourable - Recovering	Standing Open Water And Canals
	012	Favourable	Standing Open Water And Canals
	013	Favourable	Standing Open Water And Canals
	015	Unfavourable - No change	Standing Open Water And Canals
	016	Unfavourable - Recovering	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	017	Unfavourable - Recovering	Standing Open Water And Canals
	018	Favourable	Standing Open Water And Canals
	019	Favourable	Standing Open Water And Canals
	020	Favourable	Standing Open Water And Canals
	021	Favourable	Littoral Sediment
	023	Unfavourable - No change	Standing Open Water And Canals
	024	Unfavourable - Recovering	Standing Open Water And Canals
	025	Favourable	Standing Open Water And Canals
	026	Unfavourable - No change	Standing Open Water And Canals
	027	Favourable	Standing Open Water And Canals
	028	Favourable	Standing Open Water And Canals
	029	Unfavourable - Recovering	Standing Open Water And Canals
	030	Favourable	Standing Open Water And Canals
	032	Unfavourable - Recovering	Standing Open Water And Canals
	033	Favourable	Standing Open Water And Canals
	034	Favourable	Standing Open Water And Canals
	035	Favourable	Standing Open Water And Canals
	036	Favourable	Standing Open Water And Canals
	037	Unfavourable - Recovering	Standing Open Water And Canals
	038	Favourable	Standing Open Water And Canals
	039	Unfavourable - Recovering	Standing Open Water And Canals
	040	Unfavourable - Recovering	Standing Open Water And Canals
	041	Favourable	Standing Open Water And Canals
	042	Unfavourable - No change	Standing Open Water And Canals
	043	Favourable	Standing Open Water And Canals
	044	Unfavourable - No change	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	045	Favourable	Standing Open Water And Canals
	047	Unfavourable - Recovering	Standing Open Water And Canals
Hardley Flood SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Favourable	Standing Open Water And Canals
Holt Lowes SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
How Hill Track SSSI	001	Favourable	Boundary And Linear Features
Lakenheath Warren SSSI	004	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	005	Favourable	Dwarf Shrub Heath - Lowland
	007	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	009	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	011	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	012	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	013	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	016	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	017	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	018	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	019	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
Limpenhoe Meadows SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Little Heath Barnham SSSI	001	Unfavourable - Declining	Acid Grassland - Lowland
	002	Unfavourable - Recovering	Acid Grassland - Lowland
	003	Favourable	Acid Grassland - Lowland
Ludham - Potter Heigham Marshes SSSI	001	Unfavourable - Recovering	Acid Grassland - Lowland
	002	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	003	Unfavourable - Recovering	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	004	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	005	Unfavourable - Recovering	Standing Open Water And Canals
	006	Unfavourable - Recovering	Standing Open Water And Canals
Nene Washes SSSI	001	Unfavourable - Recovering	Neutral Grassland - Lowland
	002	Unfavourable - Recovering	Neutral Grassland - Lowland
	003	Unfavourable - Recovering	Neutral Grassland - Lowland
	004	Unfavourable - Recovering	Neutral Grassland - Lowland
	005	Favourable	Neutral Grassland - Lowland
	006	Favourable	Neutral Grassland - Lowland
	007	Unfavourable - Recovering	Neutral Grassland - Lowland
	008	Unfavourable - Recovering	Neutral Grassland - Lowland
North Norfolk Coast SSSI	001	Unfavourable - No change	Littoral Sediment
	002	Unfavourable - No change	Supralittoral Sediment
	003	Unfavourable - No change	Supralittoral Sediment
	004	Favourable	Inshore Sublittoral Sediment - Cl
	005	Unfavourable - No change	Littoral Sediment
	006	Favourable	Neutral Grassland - Lowland
	007	Favourable	Neutral Grassland - Lowland
	008	Unfavourable - No change	Supralittoral Sediment
	009	Unfavourable - Declining	Littoral Sediment
	010	Unfavourable - Declining	Littoral Sediment
	011	Favourable	Littoral Sediment
	012	Favourable	Supralittoral Sediment
	013	Unfavourable - Declining	Inshore Sublittoral Sediment - Cl
	014	Favourable	Fen, Marsh And Swamp - Lowland
	015	Favourable	Littoral Sediment

SSSI	Unit	Condition	Habitat
	016	Unfavourable - No change	Supralittoral Sediment
	017	Unfavourable - Declining	Littoral Sediment
	018	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	019	Unfavourable - No change	Supralittoral Sediment
	020	Unfavourable - Declining	Littoral Sediment
	021	Unfavourable - Declining	Littoral Sediment
	022	Unfavourable - Declining	Littoral Sediment
	023	Unfavourable - Declining	Supralittoral Sediment
	024	Unfavourable - Declining	Littoral Sediment
	025	Unfavourable - Declining	Littoral Sediment
	026	Favourable	Neutral Grassland - Lowland
	027	Favourable	Fen, Marsh And Swamp - Lowland
	028	Favourable	Littoral Sediment
	029	Unfavourable - Declining	Littoral Sediment
	030	Favourable	Littoral Sediment
	031	Unfavourable - Declining	Supralittoral Sediment
	032	Unfavourable - Declining	Neutral Grassland - Lowland
	033	Favourable	Arable And Horticulture
	034	Unfavourable - Declining	Littoral Sediment
	035	Unfavourable - No change	Supralittoral Sediment
	036	Unfavourable - No change	Supralittoral Sediment
	037	Favourable	Inshore Sublittoral Sediment - Cl
	038	Favourable	Inshore Sublittoral Sediment - Cl
	039	Favourable	Neutral Grassland - Lowland
	040	Favourable	Neutral Grassland - Lowland
	041	Favourable	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	042	Favourable	Littoral Sediment
	043	Unfavourable - No change	Supralittoral Sediment
	044	Unfavourable - Declining	Littoral Sediment
	045	Favourable	Littoral Sediment
	046	Favourable	Littoral Sediment
	047	Unfavourable - Declining	Littoral Sediment
	048	Favourable	Littoral Sediment
	049	Unfavourable - No change	Littoral Sediment
	050	Favourable	Neutral Grassland - Lowland
	051	Favourable	Neutral Grassland - Lowland
	052	Unfavourable - Declining	Littoral Sediment
	053	Unfavourable - Declining	Supralittoral Sediment
	054	Unfavourable - No change	Supralittoral Sediment
	055	Unfavourable - Declining	Littoral Sediment
	056	Favourable	Littoral Sediment
	057	Favourable	Fen, Marsh And Swamp - Lowland
	058	Unfavourable - Recovering	Supralittoral Sediment
	059	Favourable	Inshore Sublittoral Sediment - Cl
	060	Favourable	Fen, Marsh And Swamp - Lowland
	061	Favourable	Inshore Sublittoral Sediment - Cl
	062	Favourable	Neutral Grassland - Lowland
	063	Favourable	Neutral Grassland - Lowland
	064	Favourable	Neutral Grassland - Lowland
	065	Favourable	Neutral Grassland - Lowland
	066	Favourable	Neutral Grassland - Lowland
	070	Unfavourable - Declining	Supralittoral Sediment

SSSI	Unit	Condition	Habitat
	071	Favourable	Neutral Grassland - Lowland
	072	Favourable	Neutral Grassland - Lowland
	073	Favourable	Neutral Grassland - Lowland
Old Bodney Camp SSSI	001	Favourable	Acid Grassland - Lowland
	002	Favourable	Acid Grassland - Lowland
Ouse Washes SSSI	001	Unfavourable - No change	Neutral Grassland - Lowland
	002	Unfavourable - No change	Neutral Grassland - Lowland
	003	Unfavourable - No change	Neutral Grassland - Lowland
	004	Unfavourable - No change	Neutral Grassland - Lowland
	005	Unfavourable - No change	Neutral Grassland - Lowland
	006	Unfavourable - No change	Neutral Grassland - Lowland
	007	Unfavourable - No change	Neutral Grassland - Lowland
	008	Unfavourable - No change	Neutral Grassland - Lowland
	009	Unfavourable - No change	Neutral Grassland - Lowland
	010	Unfavourable - No change	Neutral Grassland - Lowland
	011	Unfavourable - No change	Neutral Grassland - Lowland
	012	Unfavourable - No change	Neutral Grassland - Lowland
	013	Unfavourable - No change	Neutral Grassland - Lowland
	014	Unfavourable - No change	Neutral Grassland - Lowland
	015	Unfavourable - No change	Neutral Grassland - Lowland
	018	Unfavourable - No change	Rivers And Streams
	019	Favourable	Improved Grassland
	020	Unfavourable - No change	Rivers And Streams
	021	Favourable	Improved Grassland
	022	Favourable	Rivers And Streams
	023	Favourable	Improved Grassland

SSSI	Unit	Condition	Habitat
Orton Pit SSSI	001	Favourable	Standing Open Water And Canals
	002	Unfavourable - Recovering	Standing Open Water And Canals
	003	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	004	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	005	Unfavourable - Recovering	Standing Open Water And Canals
	006	Favourable	Standing Open Water And Canals
Poplar Farm Meadows, Langley SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
Portholme SSSI	001	Unfavourable - Recovering	Neutral Grassland - Lowland
Potter & Scarning Fens, East Dereham SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Priory Meadows, Hickling SSSI	001	Unfavourable - Recovering	Acid Grassland - Lowland
	002	Favourable	Acid Grassland - Lowland
RAF Lakenheath SSSI	001	Unfavourable - Declining	Acid Grassland - Lowland
	002	Unfavourable - Declining	Acid Grassland - Lowland
	003	Unfavourable - Declining	Acid Grassland - Lowland
	004	Unfavourable - Declining	Acid Grassland - Lowland
Rex Graham Reserve SSSI	001	Favourable	Calcareous Grassland - Lowland
River Wensum SSSI	001	Favourable	Neutral Grassland - Lowland
	002	Favourable	Neutral Grassland - Lowland
	003	Favourable	Neutral Grassland - Lowland
	004	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	005	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	006	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	007	Unfavourable - Recovering	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	008	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	009	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	011	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	012	Favourable	Fen, Marsh And Swamp - Lowland
	013	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	014	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	015	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	016	Unfavourable - Recovering	Neutral Grassland - Lowland
	017	Unfavourable - Recovering	Neutral Grassland - Lowland
	018	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	019	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	020	Unfavourable - Recovering	Neutral Grassland - Lowland
	021	Unfavourable - Recovering	Neutral Grassland - Lowland
	022	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	023	Unfavourable - Recovering	Neutral Grassland - Lowland
	024	Unfavourable - Recovering	Neutral Grassland - Lowland
	025	Unfavourable - Recovering	Neutral Grassland - Lowland
	026	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	027	Unfavourable - Recovering	Neutral Grassland - Lowland
	028	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	029	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	030	Unfavourable - Recovering	Neutral Grassland - Lowland

SSSI	Unit	Condition	Habitat
	031	Unfavourable - Recovering	Neutral Grassland - Lowland
	032	Unfavourable - Recovering	Neutral Grassland - Lowland
	033	Unfavourable - Recovering	Neutral Grassland - Lowland
	034	Unfavourable - Recovering	Neutral Grassland - Lowland
	035	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	036	Unfavourable - Recovering	Neutral Grassland - Lowland
	037	Unfavourable - Recovering	Neutral Grassland - Lowland
	038	Unfavourable - No change	Neutral Grassland - Lowland
	039	Unfavourable - No change	Neutral Grassland - Lowland
	040	Unfavourable - Recovering	Neutral Grassland - Lowland
	041	Unfavourable - Recovering	Neutral Grassland - Lowland
	042	Unfavourable - Recovering	Neutral Grassland - Lowland
	043	Unfavourable - Recovering	Neutral Grassland - Lowland
	044	Unfavourable - Recovering	Neutral Grassland - Lowland
	045	Unfavourable - No change	Rivers And Streams
	046	Unfavourable - No change	Rivers And Streams
	047	Unfavourable - No change	Rivers And Streams
	048	Unfavourable - No change	Rivers And Streams
	049	Unfavourable - No change	Rivers And Streams
	050	Unfavourable - No change	Rivers And Streams
	051	Unfavourable - No change	Rivers And Streams
	052	Unfavourable - No change	Rivers And Streams
	053	Unfavourable - No change	Rivers And Streams
	054	Unfavourable - No change	Rivers And Streams
	055	Unfavourable - No change	Rivers And Streams

SSSI	Unit	Condition	Habitat
Rutland Water SSSI	029	Favourable	Standing Open Water And Canals
	030	Favourable	Standing Open Water And Canals
	031	Favourable	Standing Open Water And Canals
Shallam Dyke Marshes, Thurne SSSI	001	Unfavourable - No change	Standing Open Water And Canals
	002	Favourable	Standing Open Water And Canals
	003	Unfavourable - No change	Standing Open Water And Canals
	004	Favourable	Boundary And Linear Features
	005	Unfavourable - No change	Standing Open Water And Canals
	006	Unfavourable - No change	Standing Open Water And Canals
	007	Unfavourable - No change	Standing Open Water And Canals
	008	Unfavourable - No change	Standing Open Water And Canals
Sheringham and Beeston Regis Commons SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Smallburgh Fen SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
Southrepps Common SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Sprat's Water and Marshes, Carlton Colville SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Favourable	Fen, Marsh And Swamp - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Unfavourable - Recovering	Neutral Grassland - Lowland
	006	Favourable	Neutral Grassland - Lowland
	007	Favourable	Neutral Grassland - Lowland
	009	Unfavourable - No change	Standing Open Water And Canals
	010	Favourable	Standing Open Water And Canals
	011	Unfavourable - No change	Standing Open Water And Canals
	012	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
Stanford Training Area SSSI	004	Unfavourable - Declining	Calcareous Grassland - Lowland
	007	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	008	Unfavourable - Declining	Calcareous Grassland - Lowland
	011	Unfavourable - Declining	Calcareous Grassland - Lowland
	012	Unfavourable - Declining	Acid Grassland - Lowland
	013	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	014	Unfavourable - Declining	Calcareous Grassland - Lowland
	015	Unfavourable - Declining	Neutral Grassland - Lowland
	016	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	017	Unfavourable - Declining	Neutral Grassland - Lowland
	018	Unfavourable - Declining	Acid Grassland - Lowland
	021	Unfavourable - Declining	Acid Grassland - Lowland
	022	Unfavourable - Declining	Neutral Grassland - Lowland
	023	Unfavourable - Declining	Acid Grassland - Lowland
	024	Unfavourable - Declining	Neutral Grassland - Lowland
	025	Unfavourable - Declining	Calcareous Grassland - Lowland
	026	Favourable	Standing Open Water And Canals
	027	Unfavourable - Declining	Neutral Grassland - Lowland
	029	Unfavourable - Declining	Calcareous Grassland - Lowland
	030	Unfavourable - Declining	Acid Grassland - Lowland
	031	Unfavourable - Declining	Neutral Grassland - Lowland
	032	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	034	Unfavourable - Declining	Neutral Grassland - Lowland
	035	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	036	Unfavourable - Declining	Dwarf Shrub Heath - Lowland

SSSI	Unit	Condition	Habitat
	037	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	038	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	041	Unfavourable - Declining	Neutral Grassland - Lowland
	042	Unfavourable - Declining	Acid Grassland - Lowland
	043	Favourable	Neutral Grassland - Lowland
	044	Unfavourable - Declining	Neutral Grassland - Lowland
	045	Unfavourable - Declining	Acid Grassland - Lowland
	046	Unfavourable - Declining	Neutral Grassland - Lowland
	047	Unfavourable - Declining	Calcareous Grassland - Lowland
	048	Unfavourable - Declining	Calcareous Grassland - Lowland
	049	Unfavourable - Declining	Neutral Grassland - Lowland
	051	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	052	Unfavourable - Declining	Neutral Grassland - Lowland
	053	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	054	Unfavourable - Declining	Acid Grassland - Lowland
	055	Unfavourable - Declining	Calcareous Grassland - Lowland
	056	Unfavourable - Declining	Neutral Grassland - Lowland
	057	Unfavourable - Declining	Neutral Grassland - Lowland
	058	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	059	Unfavourable - Declining	Acid Grassland - Lowland
	060	Unfavourable - Declining	Acid Grassland - Lowland
	061	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	062	Unfavourable - Declining	Acid Grassland - Lowland
	063	Unfavourable - Declining	Acid Grassland - Lowland

SSSI	Unit	Condition	Habitat
	064	Unfavourable - Declining	Calcareous Grassland - Lowland
	065	Unfavourable - Declining	Acid Grassland - Lowland
	066	Unfavourable - Declining	Acid Grassland - Lowland
	068	Unfavourable - Declining	Acid Grassland - Lowland
	069	Unfavourable - Declining	Neutral Grassland - Lowland
	070	Unfavourable - Declining	Acid Grassland - Lowland
	071	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	072	Unfavourable - Declining	Inland Rock
	076	Unfavourable - Declining	Neutral Grassland - Lowland
	077	Unfavourable - Declining	Acid Grassland - Lowland
	078	Unfavourable - Declining	Acid Grassland - Lowland
	079	Unfavourable - Declining	Neutral Grassland - Lowland
	080	Unfavourable - Declining	Neutral Grassland - Lowland
	081	Favourable	Standing Open Water And Canals
	083	Unfavourable - Declining	Acid Grassland - Lowland
	084	Unfavourable - Declining	Calcareous Grassland - Lowland
	085	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	086	Favourable	Standing Open Water And Canals
	087	Favourable	Earth Heritage
	088	Unfavourable - Declining	Calcareous Grassland - Lowland
	089	Unfavourable - Declining	Standing Open Water And Canals
	090	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	091	Unfavourable - Declining	Acid Grassland - Lowland
	092	Unfavourable - Declining	Calcareous Grassland - Lowland
	093	Unfavourable - Declining	Calcareous Grassland - Lowland
	094	Favourable	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	095	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	096	Unfavourable - Declining	Calcareous Grassland - Lowland
	097	Unfavourable - Declining	Broadleaved, Mixed And Yew Woodland - Lowland
	098	Unfavourable - Declining	Neutral Grassland - Lowland
	099	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	0100	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
Stanley and Alder Carrs, Aldeby SSSI	001	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	003	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
Swangey Fen, Attleborough SSSI	001	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	006	Favourable	Neutral Grassland - Lowland
	007	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	008	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	009	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
Thetford Golf Course & Marsh SSSI	001	Unfavourable - No change	Dwarf Shrub Heath - Lowland
	002	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	003	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	004	Unfavourable - Recovering	Calcareous Grassland - Lowland
	005	Unfavourable - Recovering	Calcareous Grassland - Lowland
	006	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland

SSSI	Unit	Condition	Habitat
	007	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	008	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
Thetford Heaths SSSI	001	Unfavourable - No change	Acid Grassland - Lowland
	002	Favourable	Acid Grassland - Lowland
	003	Unfavourable - Recovering	Acid Grassland - Lowland
	004	Favourable	Acid Grassland - Lowland
The Wash SSSI	001	Unfavourable - Recovering	Littoral Sediment
	002	Favourable	Littoral Sediment
	003	Favourable	Littoral Sediment
	004	Favourable	Littoral Sediment
	005	Favourable	Littoral Sediment
	006	Favourable	Littoral Sediment
	007	Favourable	Littoral Sediment
	008	Favourable	Littoral Sediment
	009	Favourable	Littoral Sediment
	010	Favourable	Littoral Sediment
	011	Favourable	Littoral Sediment
	012	Favourable	Littoral Sediment
	013	Favourable	Littoral Sediment
	014	Favourable	Littoral Sediment
	015	Favourable	Littoral Sediment
	016	Favourable	Littoral Sediment
	017	Favourable	Littoral Sediment
	018	Favourable	Littoral Sediment
	019	Favourable	Littoral Sediment

SSSI	Unit	Condition	Habitat
	020	Favourable	Littoral Sediment
	021	Favourable	Littoral Sediment
	022	Favourable	Littoral Sediment
	023	Favourable	Littoral Sediment
	024	Favourable	Littoral Sediment
	025	Favourable	Littoral Sediment
	026	Favourable	Littoral Sediment
	027	Favourable	Littoral Sediment
	028	Favourable	Littoral Sediment
	029	Favourable	Littoral Sediment
	030	Favourable	Littoral Sediment
	031	Favourable	Littoral Sediment
	032	Favourable	Littoral Sediment
	033	Favourable	Littoral Sediment
	034	Unfavourable - Recovering	Littoral Sediment
	035	Unfavourable - Recovering	Littoral Sediment
	036	Unfavourable - Recovering	Littoral Sediment
	037	Favourable	Littoral Sediment
	038	Unfavourable - Recovering	Littoral Sediment
	039	Favourable	Littoral Sediment
	040	Favourable	Littoral Sediment
	041	Unfavourable - Declining	Littoral Sediment
	042	Favourable	Littoral Sediment
	043	Favourable	Littoral Sediment
	044	Unfavourable - Recovering	Littoral Sediment
	045	Favourable	Littoral Sediment

SSSI	Unit	Condition	Habitat
	046	Unfavourable - Recovering	Littoral Sediment
	047	Favourable	Littoral Sediment
	048	Favourable	Littoral Sediment
	049	Favourable	Littoral Sediment
	050	Unfavourable - Recovering	Littoral Sediment
	051	Unfavourable - Recovering	Littoral Sediment
	052	Favourable	Littoral Sediment
	053	Favourable	Littoral Sediment
	054	Favourable	Littoral Sediment
	055	Favourable	Littoral Sediment
	056	Favourable	Littoral Sediment
	057	Favourable	Littoral Sediment
	058	Unfavourable - Recovering	Littoral Sediment
	059	Favourable	Littoral Sediment
	060	Unfavourable - Recovering	Littoral Sediment
Thompson Water, Carr and Common SSSI	002	Unfavourable - Recovering	Calcareous Grassland - Lowland
	003	Unfavourable - Recovering	Calcareous Grassland - Lowland
	004	Unfavourable - No change	Neutral Grassland - Lowland
	007	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	010	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	011	Unfavourable - No change	Calcareous Grassland - Lowland
	013	Unfavourable - Declining	Standing Open Water And Canals
	017	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland

SSSI	Unit	Condition	Habitat
	018	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	019	Unfavourable - Declining	Calcareous Grassland - Lowland
	020	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
Trinity Broads SSSI	001	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	002	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	006	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	007	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	008	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	009	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	010	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	011	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	012	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	013	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	014	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	015	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland

SSSI	Unit	Condition	Habitat
	016	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	017	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	018	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	019	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	020	Unfavourable - No change	Standing Open Water And Canals
	021	Unfavourable - Recovering	Standing Open Water And Canals
	022	Unfavourable - Recovering	Standing Open Water And Canals
	023	Unfavourable - Recovering	Standing Open Water And Canals
	024	Unfavourable - Recovering	Standing Open Water And Canals
Upper Colne Marshes SSSI	001	Unfavourable - Recovering	Neutral Grassland - Lowland
	002	Unfavourable - Recovering	Neutral Grassland - Lowland
	003	Favourable	Littoral Sediment
	004	Favourable	Neutral Grassland - Lowland
Upper Nene Valley Gravel Pits SSSI	001	Unfavourable - Recovering	Neutral Grassland - Lowland
	002	Unfavourable - Recovering	Neutral Grassland - Lowland
	003	Favourable	Littoral Sediment
	004	Favourable	Neutral Grassland - Lowland
Upper Thurne Broads and Marshes SSSI	003	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Favourable	Fen, Marsh And Swamp - Lowland
	007	Favourable	Standing Open Water And Canals
	009	Favourable	Fen, Marsh And Swamp - Lowland
	010	Favourable	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
	012	Favourable	Fen, Marsh And Swamp - Lowland
	014	Unfavourable - No change	Standing Open Water And Canals
	015	Unfavourable - No change	Standing Open Water And Canals
	016	Unfavourable - Declining	Standing Open Water And Canals
	017	Unfavourable - Declining	Standing Open Water And Canals
	018	Unfavourable - Declining	Standing Open Water And Canals
	019	Favourable	Standing Open Water And Canals
	020	Favourable	Fen, Marsh And Swamp - Lowland
	021	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	022	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	023	Unfavourable - No change	Standing Open Water And Canals
	024	Favourable	Fen, Marsh And Swamp - Lowland
	025	Favourable	Fen, Marsh And Swamp - Lowland
Upton Broad & Marshes SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Favourable	Fen, Marsh And Swamp - Lowland
	003	Favourable	Fen, Marsh And Swamp - Lowland
	004	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	005	Unfavourable - Recovering	Standing Open Water And Canals
	006	Unfavourable - Recovering	Standing Open Water And Canals
	007	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	008	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	009	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Favourable	Standing Open Water And Canals
	011	Favourable	Fen, Marsh And Swamp - Lowland
	012	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland

SSSI	Unit	Condition	Habitat
	013	Unfavourable - No change	Standing Open Water And Canals
	014	Unfavourable - Recovering	Standing Open Water And Canals
	015	Unfavourable - Recovering	Standing Open Water And Canals
	016	Favourable	Standing Open Water And Canals
	017	Favourable	Standing Open Water And Canals
	018	Unfavourable - Recovering	Standing Open Water And Canals
Wangford Warren and Carr SSSI	004	Unfavourable - Recovering	Acid Grassland - Lowland
	005	Unfavourable - Recovering	Acid Grassland - Lowland
	006	Unfavourable - Recovering	Acid Grassland - Lowland
	008	Unfavourable - Recovering	Acid Grassland - Lowland
	009	Favourable	Acid Grassland - Lowland
Weather and Horn Heaths, Eriswell SSSI	001	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	002	Unfavourable - Declining	Dwarf Shrub Heath - Lowland
	003	Partially destroyed	Dwarf Shrub Heath - Lowland
Weeting Heath SSSI	001	Favourable	Calcareous Grassland - Lowland
	002	Unfavourable - Recovering	Calcareous Grassland - Lowland
	003	Unfavourable - Recovering	Calcareous Grassland - Lowland
	004	Favourable	Calcareous Grassland - Lowland
	005	Unfavourable - No change	Calcareous Grassland - Lowland
	006	Unfavourable - Recovering	Arable And Horticulture
West Stow Heath SSSI	001	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	002	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	003	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	004	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland
	005	Unfavourable - Recovering	Dwarf Shrub Heath - Lowland

SSSI	Unit	Condition	Habitat
Yare Broads and Marshes SSSI	001	Favourable	Fen, Marsh And Swamp - Lowland
	002	Unfavourable - Declining	Broadleaved, Mixed And Yew Woodland - Lowland
	003	Favourable	Broadleaved, Mixed And Yew Woodland - Lowland
	004	Favourable	Fen, Marsh And Swamp - Lowland
	005	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	006	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	007	Unfavourable - Declining	Fen, Marsh And Swamp - Lowland
	008	Favourable	Fen, Marsh And Swamp - Lowland
	009	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	010	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	011	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	012	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	013	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	014	Unfavourable - Recovering	Broadleaved, Mixed And Yew Woodland - Lowland
	015	Unfavourable - No change	Standing Open Water And Canals
	016	Favourable	Fen, Marsh And Swamp - Lowland
	017	Favourable	Fen, Marsh And Swamp - Lowland
	018	Favourable	Fen, Marsh And Swamp - Lowland
	019	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	020	Unfavourable - Recovering	Fen, Marsh And Swamp - Lowland
	021	Unfavourable - No change	Fen, Marsh And Swamp - Lowland
	022	Favourable	Fen, Marsh And Swamp - Lowland
	023	Favourable	Standing Open Water And Canals
	024	Unfavourable - Recovering	Standing Open Water And Canals

SSSI	Unit	Condition	Habitat
	025	Favourable	Standing Open Water And Canals
	026	Unfavourable - Recovering	Standing Open Water And Canals
	027	Favourable	Standing Open Water And Canals
	028	Favourable	Standing Open Water And Canals

ANNEX-3: POTENTIAL CHANGES TO PHYSICAL ENVIRONMENT

Table AN- 26: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of the Lower Colne (Ardleigh Reservoir) Drought Permit

ZoI / Impact	Reach 1		Reach 2		Reach 3	
	Summer (May – Nov)	Winter (Dec – Apr)	Summer (May – Nov)	Winter (Dec – Apr)	Summer (May – Nov)	Winter (Dec – Apr)
Hydrology	Negligible	Negligible	Minor	Minor	Negligible	Negligible
Geomorphology	Negligible	Negligible	Minor	Minor	Negligible	Negligible
Water Quality	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Impact of other abstractions	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Impact of discharges	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Zol / Impact	Reach 1		Reach 2		Reach 3	
	Summer (May – Nov)	Winter (Dec – Apr)	Summer (May – Nov)	Winter (Dec – Apr)	Summer (May – Nov)	Winter (Dec – Apr)
Impact on other abstractors	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Table AN- 27: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit

Zol / Impact	River Wissey				River Little Ouse		Cut-Off Channel
	Reach 1	Reach 2	Reach 3	Reach 4	Reach 1	Reach 2	Reach 1
Hydrogeology	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrology	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor
Hydrology Confidence	High confidence for all				High confidence for all		Medium confidence
Geomorphology	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Geomorphology Confidence	High confidence with respect to the impact of abstraction on geomorphology by hydrology change. Low to medium confidence with respect to geomorphological information availability						
Water Quality	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	No data
Water Quality Confidence	Medium	N/A	Medium	N/A	Low	Medium	N/A
Impact on other surface water abstractors	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Impact on other surface water abstractors confidence	High-Medium confidence for all						

Table AN- 28: Summary of Potential Changes to the Physical Environment of the Groundwater Abstractors from Implementation of the Wellington Wellfield (Stoke Ferry & Marham WTW) Drought Permit

ZoI / Impact	Within ZOI
Impact on other groundwater abstractors	Negligible
Impact on other groundwater abstractors Confidence	High confidence

Table AN- 29: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of the River Nene (Rutland Water) Drought Permit

River Reach	Reach 1		Reach 2	
Impact	**Summer (May – Nov)**	**Winter (Dec – Apr)**	**Summer (May – Nov)**	**Winter (Dec – Apr)**
Hydrology	Major	Major	Major	Major
Geomorphology	Minor	Minor	Minor	Minor
Water Quality	Major (Orthophosphate) Moderate (dissolved oxygen) Negligible (ammonia)	Major (Orthophosphate) Minor (dissolved oxygen) Negligible (ammonia)	Major (Orthophosphate) Moderate (dissolved oxygen Negligible (ammonia)	Major (Orthophosphate) Minor (dissolved oxygen) Negligible (ammonia)
Impact on other abstractors	Moderate	Minor	Major	Moderate

Table AN- 30: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of stage 1 and stage 2 of the River Gt Ouse (Grafham Water) Drought Permit

River Reach	Reach 1				Reach 2			
Impact	Stage 1		Stage 2		Stage 1		Stage 2	
	Summer (Apr – Sep)	Winter (Oct – Mar)	Summer (Apr – Sep)	Winter (Oct – Mar)	Summer (Apr – Sep)	Winter (Oct – Mar)	Summer (Apr – Sep)	Winter (Oct – Mar)
Hydrology	Moderate	Minor	Major	Moderate	Minor	Minor	Major	Minor
Geomorphology	Minor	Minor	Moderate	Minor	Negligible	Negligible	Minor	Minor
Water Quality	Moderate (Orthophosphate) Minor (Ammonia and DO)	Minor (all)	Major (Orthophosphate) Minor (Ammonia and DO	Moderate (orthophosphate) Minor (ammonia and DO)	Minor (Orthophosphate and ammonia)	Minor (Orthophosphate and ammonia)	Major (Orthophosphate) Minor (Ammonia and DO	Minor (Orthophosphate and ammonia)
Impact of artificial influences	Negligible	Negligible	Negligible	Negligible	Moderate (ammonia)	Moderate (ammonia)	Moderate (ammonia)	Moderate (ammonia)
Impact on other abstractors	Negligible	Negligible	Negligible	Negligible	Moderate	Negligible	Moderate	Negligible

Table AN- 31: Summary of potential changes in the physical environment as a result of the Costessey (Heigham WTW) Drought Permit

River	River Wensum						River Tud		River Yare	
	Reach 1		Reach 2		Reach 3		Reach 1		Reach 1	
Impact	Summer (Apr - Sep)	Winter (Oct - Mar)	Summer (Apr - Sep)	Winter (Oct - Mar)	Summer (Apr - Sep)	Winter (Oct - Mar)	Summer (Apr - Sep)	Winter (Oct - Mar)	Summer (Apr - Sep)	Winter (Oct - Mar)
Groundwater	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Hydrology	Negligible	Negligible	Minor	Negligible	Minor	Minor	Negligible	Negligible	Negligible	Negligible
Geomorphology	Negligible	Negligible	Minor	Negligible	Minor	Minor	Negligible	Negligible	Negligible	Negligible
Water Quality	Negligible	Negligible	Minor (orthophosphate)	Negligible	Minor (orthophosphate)	Minor (orthophosphate)	Negligible	Negligible	Negligible	Negligible

Table AN- 32: Summary of Potential Changes to the Physical Environment of the Impacted Reaches from Implementation of the River Nene (Pitsford Water) Drought Permit

River Reach	Reach 1		Reach 2		Reach 3		Reach 4		Reach 5		Reach 6	
Impacts	**Summer (May-Nov)**	**Winter (Dec-Apr)**	**Summer (May-Nov)**	**Winter (Dec-Apr)**	**Summer (May-Nov)**	**Winter (Dec-Apr)**	**Summer (May-Nov)**	**Winter (Dec-Apr)**	**Summer (May-Nov)**	**Winter (Dec-Apr)**	**Summer (May-Nov)**	**Winter (Dec-Apr)**
Hydrology	Major	Major	Moderate	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Negligible	Negligible
Geomorphology	Moderate	Moderate	Minor	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Water quality - orthophosphate	Major	Major	Moderate	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Negligible	Negligible
Water quality - dissolved oxygen	Moderate	Moderate	Minor	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Negligible	Negligible
Impact on other abstractors	Minor	Minor	Minor	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor	Negligible	Negligible

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