AECOM

Horsford Neighbourhood Plan

Habitats Regulations Assessment

Horsford Parish Council

February 2025

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Madeleine Bunn Consultant Ecologist	Lisa Rigby Principal Ecologist	Dr James Riley Technical Director	Dr James Riley Technical Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	11/02/25	Draft	JR	James Riley	Technical Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Horsford Parish Council

Prepared by:

Madeleine Bunn
Consultant Ecologist

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

Table of Contents

Plates

Tables

1. Introduction

Background to the Project

1.1 AECOM was appointed by Horsford Parish Council to undertake a Report to Inform the Habitats Regulations Assessment (HRA) for the Horsford Neighbourhood Plan Refresh 2025. This is to inform the Broadland District Council (as competent authority) of the potential effects of the NP development on Habitat sites ((Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites (designated under the Ramsar convention)), formerly referred to as European sites, and how they are being or should be addressed in the NP.

1.1 The Horsford NP contains policies on housing, transport, community facilities, commercial developments and the environment. The plan allocates 300 dwellings for development.

1.2 The Horsford Neighbourhood Plan (NP) and any subsequent development would have to adhere to the Greater Norwich Local Plan (GNLP), adopted on March 28th, 2024. The Greater Norwich Local Plan HRA (The Landscape Partnership 2023) sets out impacts to Habitat sites and the mitigation required for the Greater Norwich Local Plan area.

1.3 The objective of this report is to identify if any policies and/ or site allocations proposed in the Horsford NP have the potential to cause Likely Significant Effects (LSEs) and, where identified, adverse effects on the integrity of Habitat sites, either in isolation or in combination with other plans and projects, and to determine whether policy mitigation measures are required.

Local Context

1.4 The Parish of Horsford covers an area of approximately 1,655 hectares (ha) and is located approximately 6 miles north of Norwich, within Norfolk. Horsford is the only major settlement in the Parish.

1.5 The parish population, as recorded in the 2021 Census[1], is now around 4,937 usual residents. Of those of a working age, 28.3% work mainly from home (although the data for this may be slightly skewed as it was taken during the Covid pandemic).

Legislative Framework

1.6 The UK left the EU on 31 January 2019 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). This established a transition period, which ended on 31 December 2020. The Withdrawal Act retains the body of existing EU-derived law within our domestic law. During the transition period EU law applies to and in the UK. The most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[2] – make it clear that the need for HRA has continued after the end of the Transition Period.

[1] Available at: https://horsford.parish.uk/census/

[2] These don’t replace the 2017 Regulations but are just another set of amendments

1.7 Under the Regulations, an appropriate assessment is required, where a plan or project is likely to have a significant effect upon an international site, either individually or in combination with other projects. The Directive is implemented in the UK by the Conservation of Habitats and Species Regulations 2017 (as amended) (the "Habitats Regulations").

The legislative basis for Appropriate Assessment

Conservation of Habitats and Species Regulations 2017 (as amended)

With specific reference to Neighbourhood Plans, Regulation 106(1) states that:
'A qualifying body which submits a proposal for a neighbourhood development plan must provide such information as the competent authority [the Local Planning Authority] *may reasonably require for the purposes of the assessment under regulation 105* [which sets out the formal process for determination of 'likely significant effects' and the 'appropriate assessment']…'.

1.8 It is therefore important to note that this report has two purposes:

a. To assist the Qualifying Body (Horsford Parish Council) in preparing their plan by recommending (where necessary) any adjustments required to protect international sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and

b. On behalf of the Qualifying Body, to assist the Local Planning Authority (Broadland District Council) to discharge their duty under Regulation 105 (in their role as 'plan-making authority' within the meaning of that regulation) and Regulation 106 (in their role as 'competent authority').

1.9 As 'competent authority', the legal responsibility for ensuring that a decision of 'likely significant effects' is made, for ensuring an 'appropriate assessment' (where required) is undertaken, and for ensuring Natural England are consulted, falls on the local planning authority and the Neighbourhood Plan examiner. However, they are entitled to request from the Qualifying Body the necessary information on which to base their judgment and that is a key purpose of this report.

1.10 Over the years the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'. Throughout this report we use the term Habitats Regulations Assessment for the overall process.

1.1 In spring 2018 the 'Sweetman' European Court of Justice ruling[3], clarified that 'mitigation' (i.e., measures that are specifically introduced to avoid or reduce a harmful effect on a Habitat site that would otherwise arise) should **not** be taken into account when forming a view on likely significant effects. Mitigation should instead only be considered at the Appropriate Assessment stage. This HRA has been cognisant of that ruling.

[3] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

The Layout of this Report

1.2 Chapter 2 of this report explains the methodology by which this HRA has been carried out, including the three essential tasks that form part of HRA. Chapter 3 provides details of the relevant Habitat sites. Chapter 4 provides detailed background on the main impact pathways identified in relation to the Neighbourhood Plan and the relevant Habitat sites. Chapter 5 undertakes the screening assessment of Likely Significant Effects (LSEs) of the Plan's policies. Chapter 6 undertakes the Appropriate Assessment of those Policies that could be screened out in Chapter 5. The conclusions arising from the HRA process so far are provided in Chapter 7.

Quality Assurance

1.3 This report was undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2015 and 14001:2015, ISO 44001:2017 and ISO 45001:2018. In addition, our IMS requires careful selection and monitoring of the performance of all sub-consultants and contractors.

1.4 All AECOM Ecologists working on this project are members (at the appropriate level) of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017).

2. Methodology

Introduction

2.1 The HRA has been carried out with reference to the general EC guidance on HRA (European Commission, 2001)[4] and general guidance on HRA published by the UK government in 2021 (Department for Environment, Food & Rural Affairs, 2021)[5].

2.2 Plate 1 below outlines the stages of HRA according to current Department for Levelling Up, Housing & Communities guidance[6]. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations, and any relevant changes to the Plan until no significant adverse effects remain.

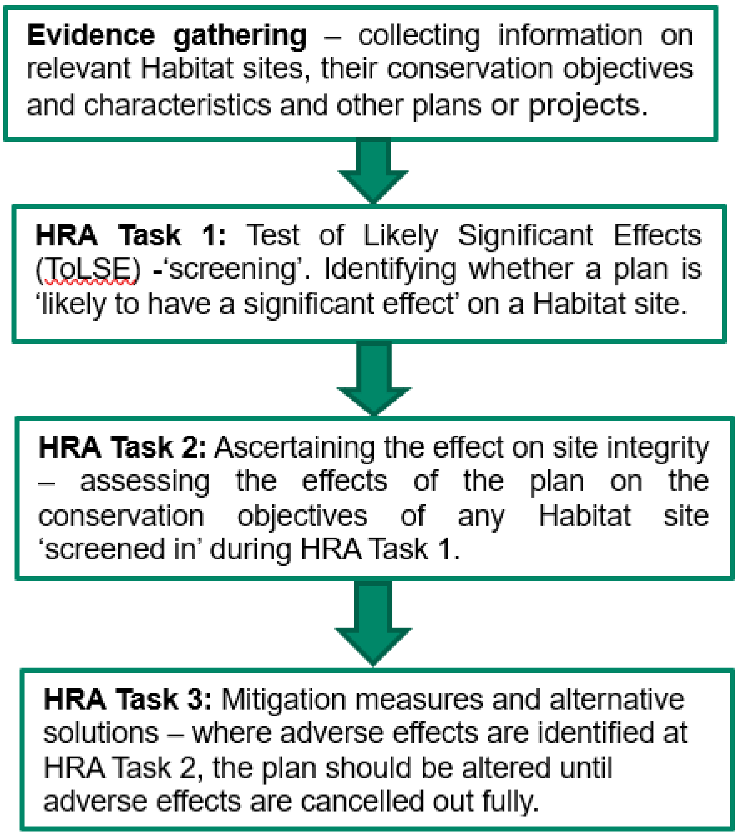

Plate 1. Four Stage Approach to Habitats Regulations Assessment (Department for Environment, Food & Rural Affairs, 2021)

[4] European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive

[5] Available at: https://www.gov.uk/guidance/appropriate-assessment

[6] Available at: https://www.gov.uk/guidance/appropriate-assessment

HRA Task 1 – Likely Significant Effects (LSE)

2.3 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Test of Likely Significant Effect (ToLSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"*Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?*"

2.4 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon Habitat sites, usually because there is no mechanism for an adverse interaction with Habitat sites.

2.5 In the Waddenzee case[7] the European Court of Justice ruled on the interpretation of Article 6(3) of the Habitats Directive, including that:

- An effect should be considered 'likely', *"if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site"* (para 44);
- An effect should be considered 'significant', *"if it undermines the conservation objectives"* (para 48); and
- Where a plan or project has an effect on a site *"but is not likely to undermine its conservation objectives, it cannot be considered likely to have a significant effect on the site concerned"* (para 47).

2.6 The ToLSE consists of two parts: Firstly, determining whether there are any policies that could result in negative impact pathways and secondly establishing whether there are any Habitat sites that might be affected. It identifies Habitat sites that could be affected by the Plan and also those impact pathways that are most likely to require consideration.

2.7 It is important to note that the ToLSE must generally follow the precautionary principle as its main purpose is to determine whether the subsequent stage of 'Appropriate Assessment' (i.e., a more detailed investigation) is required.

HRA Task 2: Appropriate Assessment (AA)

2.8 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn, the analysis has proceeded to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'Appropriate Assessment' is <u>not</u> a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to Appropriate Assessment rather than determination of likely significant effects. It literally means '*whatever level of further assessment is appropriate to form a conclusion regarding effects on the integrity of relevant European sites'.*

2.9 In 2018 the Holohan ruling[8] handed down by the European Court of Justice included among other provisions paragraph 39 of the ruling stating that '*As regards other habitat types or species, which are present on the site, but for*

[7] Case C-127/02
[8] Case C-461/17

which that site has not been listed, and with respect to habitat types and species located outside that site, … typical habitats or species must be included in the appropriate assessment, <u>if they are necessary to the conservation of the habitat types and species listed for the protected area'</u> [emphasis added].

2.10 During July 2019 the Department for Levelling Up, Housing and Communities (DLHC) published guidance for Appropriate Assessment (Department for Levelling Up, Housing and Communities, 2019)[9].

2.11 Paragraph: 001 Reference ID: 65-001-20190722 explains: '*Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view of the site's conservation objectives. The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured*'.

2.12 One of the key considerations during Appropriate Assessment is whether there is available mitigation that would address the potential effect. In evaluating significance, AECOM will rely on professional judgement as well as the results of bespoke studies, supported by appropriate evidence/data within this assessment.

HRA Task 3 – Avoidance and Mitigation

2.13 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on Habitat sites. There is considerable precedent concerning the level of detail that a Neighbourhood Plan document needs to contain regarding mitigation for recreational impacts on Habitat sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the Plan, but the Plan must provide an adequate policy framework within which these measures can be delivered.

2.14 In evaluating significance, AECOM has relied on professional judgement and the Local Plan HRA regarding development impacts on the Habitat sites considered within this assessment.

2.15 When discussing 'mitigation' for a Neighbourhood Plan document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the detail of the mitigation measures themselves since the Local Development Plan document is a high-level policy document. A Neighbourhood Plan is a lower level constituent of a Local Development Plan.

[9] Available at: https://www.gov.uk/guidance/appropriate-assessment

Confirming Other Plans and Projects That May Act 'In Combination'

2.16 It is a requirement of the Regulations that the impacts of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the Habitat site(s) in question.

2.17 In considering the potential for combined regional housing development to impact on Habitat sites the primary consideration is the impact of visitor numbers – i.e., recreational pressure and urbanisation.

2.18 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e., to ensure that those projects or plans (which in themselves may have minor impacts) are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in combination assessment is therefore of greatest relevance when the plan or policy would otherwise be screened out because its individual contribution is inconsequential. The overall approach is to exclude the risk of there being unassessed likely significant effects in accordance with the precautionary principle. This was first established in the seminal Waddenzee[10] case.

2.19 For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects with potential for in combination likely significant effects are those schemes that have the following impact pathways: Loss of functionally linked land, recreational pressure, air quality impacts, water quality impacts and water quantity level and flow. The following plans have been assessed for their in-combination impact to interact with the Horsford Neighbourhood Plan:

- The Greater Norwich Local Plan[11]
- Hellesdon Neighbourhood Plan[12]
- Taverham Neighbourhood Plan 2021[13]
- Drayton Neighbourhood Plan 2016[14]

2.20 It should be noted that, while the broad potential impacts of these other projects and plans have been considered, this assessment does not undertake full HRA on each of these plans. Instead, existing HRAs that have been carried out for surrounding authorities and plans were drawn upon.

2.21 Within this document, each policy within the NP is subjected to HRA screening (summarised in Table 8). LSEs are then scrutinised in more detail in the main body of the report and where necessary an AA is undertaken.

[10] Waddenzee case (Case C-127/02, [2004] ECR-I 7405)
[11] https://www.gnlp.org.uk/
[12] https://www.southnorfolkandbroadland.gov.uk/asset-library/imported-assets/hellesdon-nhood-plan-final-version-small.pdf
[13] https://www.southnorfolkandbroadland.gov.uk/planning/future-development/neighbourhood-plans/adopted-neighbourhood-plans-broadland/taverham-neighbourhood-plan
[14] https://www.southnorfolkandbroadland.gov.uk/planning/future-development/neighbourhood-plans/adopted-neighbourhood-plans-broadland/drayton-neighbourhood-plan

3. Physical Scope of the HRA

Introduction

3.1 There is no guidance that dictates the general physical scope of an HRA of a Plan document. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model).

3.2 Briefly defined, impact pathways are routes by which the implementation of a project can lead to an effect upon a Habitat site. An example of this would be visual and noise disturbance arising from the construction/decommissioning work or operational phase associated with a project. If there are sensitive ecological receptors within a nearby Habitat site (e.g. non-breeding overwintering birds), this could alter their foraging and roosting behaviour and potentially affect the site's integrity. For some impact pathways (notably air pollution) there is guidance that sets out distance-based zones required for assessment. For others, a professional judgment must be made based on the best available evidence.

Habitat Sites Relevant to the Neighbourhood Development Plan

3.3 In the case of the Horsford NP, it has been determined that the Habitat sites identified in Table 1 require consideration. The background to these Habitat sites is discussed in Appendix A.

Table 1. Habitat site descriptions and distance from Horsford NP area

Site Name/Designation	Environmental Vulnerabilities	Distance from Neighbourhood Plan Area Boundary
Broadland SPA Broadland Ramsar	• water pollution; • climate change; • invasive species; • siltation; • inappropriate water levels; • hydrological change; • water abstraction • change in land management; • inappropriate ditch management; • inappropriate scrub control; • change in species distributions; • public access/disturbance; • under grazing; • drainage; • direct impact from third parties;	9.2 km west

Site Name/Designation	Environmental Vulnerabilities	Distance from Neighbourhood Plan Area Boundary
	• inappropriate coastal management; and, • air pollution.	
The Broads SAC	• water pollution; • climate change; • invasive species; • siltation; • inappropriate water levels; • hydrological change; • water abstraction • change in land management; • inappropriate ditch management; • inappropriate scrub control; • change in species distributions; • public access/disturbance; • under grazing; • drainage; • direct impact from third parties; • inappropriate coastal management; and, • air pollution.	9.2 km west
Norfolk Valley Fens SAC	• Inappropriate water levels • Inappropriate scrub levels • Hydrological changes • Water pollution • Inappropriate cutting/mowing • Water abstraction • Under grazing • Overgrazing • Invasive species • Change in land management • Changes in species distributions • Air pollution: impact of atmospheric nitrogen deposition	2.8 km north west
River Wensum SAC	• Physical modification • Inappropriate weirs, dams, and other structures • Siltation • Invasive species • Water pollution • Water abstraction	3.0 km west

Relevant Impact Pathways

3.4 The European sites that are described in Table one and Appendix A are located within 10 km radius of the Horsford NP area.

3.5 Based upon Natural England Site Improvement Plans and Supplementary Advice on Conservation Objectives, there are several pathways that require consideration regarding increased development within the Horsford NP area and said European sites. These are:

- Recreational Pressure;
- Air Pollution;
- Nutrient Neutrality (Water Pollution); and,
- Water Resources (Abstraction).

4. Background to Impact Pathways

Recreational Pressure

4.1 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily by fear reactions or taking flight and the time they spend responding to disturbance is time that is not spent feeding (this will apply all year round)[15]. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the "condition" and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds[16]. Moreover, the more time a breeding bird spends disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they, or any nestlings, are to predators.

4.2 The potential for disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. In addition, the consequences of disturbance at a population level may be reduced because birds are not breeding. However, activity outside of the summer months can still cause important disturbance, especially as birds are particularly vulnerable at this time of year due to food shortages. Disturbance which results in abandonment of suitable feeding areas can have severe consequences for those birds involved and their ability to find alternative feeding areas. Several empirical studies have, through correlative analysis, demonstrated that out-of-season (October-March) recreational activity can result in quantifiable disturbance:

- Tuite et al[17] found that during periods of high recreational activity, bird numbers at Llangorse Lake decreased by 30% as the morning progressed, matching the increase in recreational activity towards midday. During periods of low recreational activity, however, no change in numbers was observed as the morning progressed. In addition, all species were found to spend less time in their 'preferred zones' (the areas of the lake used most in the absence of recreational activity) as recreational intensity increased;

- Underhill et al[18] counted waterfowl and all disturbance events on 54 water bodies within the South West London Water Bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas;

[15] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

[16] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

[17] Tuite, C. H., Owen, M. & Paynter, D. 1983. Interaction between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34: 48-63

[18] Underhill, M.C. et al. 1993. Use of Waterbodies in South West London by Waterfowl. An Investigation of the Factors Affecting Distribution, Abundance and Community Structure. Report to Thames Water Utilities Ltd. and English Nature. Wetlands Advisory Service, Slimbridge

- Evans & Warrington[19] found that on Sundays total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to weekdays displacing birds into the LNR. However, in this study, recreational activity was not quantified in detail, nor were individual recreational activities evaluated separately; and

- Tuite et al[20] used a large (379 site), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They found that shoveler was one of the most sensitive species to disturbance. The greatest impact on wildfowl numbers during these months was associated with sailing/windsurfing and rowing.

4.3 More recent research has established that human activity including recreational activity can be linked to disturbance of wintering waterfowl populations[21] [22].

4.4 Human activity can affect birds either directly (e.g. by causing them to flee) or indirectly (e.g. by damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, avoidance of certain areas *etc.*) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death[23].

4.5 The degree of impact that varying levels of noise will have on different species of bird is poorly understood except that a number of studies have found that an increase in traffic levels on roads does lead to a reduction in the bird abundance within adjacent hedgerows - Reijnen et al (1995) examined the distribution of 43 passerine species (i.e. 'songbirds'), of which 60% had a lower density closer to the roadside than further away. By controlling vehicle usage, they also found that the density generally was lower along busier roads than quieter roads[24].

4.6 A recent study on recreational disturbance on the Humber[25] assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft (see Drewitt 1999[26]), traffic (Reijnen, Foppen, & Veenbaas 1997)[27], dogs (Lord, Waas, & Innes 1997[28]; Banks & Bryant 2007[29]) and machinery (Delaney et al. 1999; Tempel & Gutierrez 2003). These studies identified that there is still relatively little work on the effects of different types of water based craft and the

[19] Evans, D.M. & Warrington, S. 1997. The effects of recreational disturbance on wintering waterbirds on a mature gravel pitlake near London. International Journal of Environmental Studies 53: 167-182
[20] Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62
[21] Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary
[22] Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent disturbance and mitigation project – various reports.
[23] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[24] Reijnen, R. et al. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. Journal of Applied Ecology 32: 187-202
[25] Helen Fearnley Durwyn Liley and Katie Cruickshanks (2012) Results of Recreational Visitor Survey across the Humber Estuary produced by Footprint Ecology
[26] Drewitt, A. (1999) Disturbance effects of aircraft on birds. English Nature, Peterborough.
[27] Reijnen, R., Foppen, R. & Veenbaas, G. (1997) Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. Biodiversity and Conservation, 6, 567-581.
[28] Lord, A., Waas, J.R. & Innes, J. (1997) Effects of human activity on the behaviour of northern New Zealand dotterel Charadrius obscurus aquilonius chicks. Biological Conservation, 82,15-20.
[29] Banks, P.B. & Bryant, J.V. (2007) Four-legged friend of foe? Dog-walking displaces native birds from natural areas. Biology Letters, 3, 611-613.

impacts from jet skis, kite surfers, windsurfers etc. (see Kirby et al. 2004[30] for a review). Some types of disturbance are clearly likely to invoke different responses. In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) will both influence the response (Delaney et al. 1999[31]; Beale & Monaghan 2005[32]). On UK estuaries and coastal sites, a review of WeBS data showed that, among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance (Robinson & Pollitt 2002)[33].

4.7 Other disturbing activities are on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.

4.8 Recreational catchments vary from European site to European site but for catchments for inland sites are often in the range of 2-7km. Various research reports have provided compelling links between changes in housing and access levels. The results of studies compiling visitor survey data for a range of European sites[34] demonstrate that more housing consistently means more visitors to protected sites, across most habitats. This is particularly the case for on-foot visitors that originate from housing within 1.5 km, highlighting that additional housing development in close proximity to protected sites is likely to significantly increase recreation pressure. For those sites with car parks, levels of housing within 15 km of protected sites were also a significant predictor of visitor pressure but depended on habitat type.

Broadland SPA and Ramsar

4.9 In the NP area, the Broadland SPA and Ramsar site is likely to have the largest recreational catchment.

4.10 Several aspects of recreational pressure could occur on the Broadland SPA and Ramsar. These include;

- Damage to soil and vegetation through trampling and erosion;
- Disturbance to sensitive species, particularly ground-nesting birds and wintering waterfowl;
- Eutrophication through dog fouling; and,
- Littering, vandalism, increased risk of fire and illegal vehicular usage.

---

[30] Kirby, J.S., Clee, C. & Seager, V. (1993) Impact and extent of recreational disturbance to wader roosts on the Dee estuary: some preliminary results. Wader Study Group Bulletin, 68, 53-58.
[31] Delaney, D.K., Grubb, T.G., Beier, P., Pater, L.L.M. & Reiser, H. (1999) Effects of Helicopter Noise on Mexican Spotted Owls. The Journal of Wildlife Management, 63, 60-76.
[32] Beale, C.M. & Monaghan, P. (2005) Modeling the Effects of Limiting the Number of Visitors on Failure Rates of Seabird Nests. Conservation Biology, 19, 2015-2019.
[33] Robinson, J.A. & Pollitt, M.S. (2002) Sources and extent of human disturbance to waterbirds in the UK: an analysis of Wetland Bird Survey data, 1995/96 to 1998/99: Less than 32% of counters record disturbance at their site, with differences in causes between coastal and inland sites. Bird Study, 49, 205.
[34] Weitowitz D.C., Panter C., Hoskin R. & Liley D. 2019. The effect of urban development on visitor numbers to nearby protected nature conservation sites. Journal of Urban Ecology 5. https://doi.org/10.1093/jue/juz019

Water Quality – Nutrient Neutrality

4.11 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Eutrophication, the enrichment of water with nutrients, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In freshwater ecosystems, plant growth is primarily determined by phosphorus concentrations, which are determined by a wide range of sources, including treated sewage effluent from Wastewater Treatment Works and urban surfaces such as roads.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

River Wensum SAC and The Broads SAC

4.12 Since 2022, it has been known that the River Wensum SAC and The Broads SAC are negatively impacted by excess nitrate and phosphate in the water. This is from agricultural (e.g., fertilisers) and urban sources (e.g., increased effluent from greater development). The GNLP HRA states that new residential development would need to demonstrate that it would not exacerbate the existing problem by adding further nitrate and phosphate from its sewage and run-off.

4.13 Two calculators can be used to assess the level of increase in nitrate and phosphate production for the development: the Natural England calculator and a calculator developed by Royal Haskoning.. Natural England has advised that the Royal Haskoning calculator is less precautionary than the Natural England calculator, but they will not oppose its use (Natural England 2022). Therefore, the developer must decide on the calculator to be utilised.

4.14 A draft version of the mitigation strategy was published as part of the Greater Norwich Local Plan Examination process in January 2023 (Royal Haskoning DHV, 2023). This sets out the draft mitigation solutions for nutrient neutrality impacts across Norfolk. It is likely that a combination of measures will be required to offset the impact of any planned development, and therefore, the developer should consult the document and any updated documents throughout the design process of the site allocated in the Neighbourhood Plan.

Water Resources – Abstraction

4.15 An increase in population growth will also create an increased demand for water resources within the Combined Authority area, this increase in demand for water may affect sensitive European Sites.

4.16 The HRA of the GNLP references the Anglian Water Services Water Resource Management Plan (WRMP) and a water cycle study undertaken by AECOM in 2021. These confirm that Anglian Water's measures to improve the efficiency of existing homes and businesses, reduce leakage by mending leaky water mains, and design new homes to be water-efficient will mean that no new abstractions are required, and therefore, there would be no impact on Habitat sites.

4.17 Given that Anglian Water provides the whole of Norfolk with drinking water and has confirmed it can provide enough water for the county, the Neighbourhood Plan is unlikely to impact Habitat sites.

Atmospheric Pollution

4.18 The main pollutants of concern for Habitats sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or NH_3 concentrations within the atmosphere will lead to greater rates of nitrogen (N) deposition to soils. An increase in atmospheric N deposition to soils is generally regarded to lead to an increase in soil fertility, which can have a deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

Table 2 Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO_2, NO_x and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased nitrogen emissions may cancel out any gains produced by reduced sulphur levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH_3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4^+) containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO_x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations.	Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3) can lead to both soil and freshwater acidification. In addition, NO_x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.

Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO_X and NH_3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions from NO_x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to humans and wildlife and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.
Sulphur Dioxide SO_2	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO_2 emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO_2 acidifies soils and freshwater and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

4.19 SO_2 emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. NH_3 emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO_2 or NH_3 emissions will be associated with Local Plans. NOx emissions, however, are dominated by the output of vehicle exhausts. Within a ‘typical’ housing development, by far the largest contribution to NOx (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison. Emissions of NOx could therefore be reasonably expected to increase due to greater vehicle use as a result of the Horsford NP.

4.20 According to the World Health Organisation, the NOx Critical Level for the protection of vegetation is 30 μgm^{-3} and the threshold for SO_2 is 20 μgm^{-3}. In addition, ecological studies have determined Critical Loads (CLs) of atmospheric N deposition (that is, NOx combined with ammonia NH_3) for key habitats within Habitats sites.

4.21 According to the Department of Transport’s Transport Analysis Guidance, ‘*Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant’* (see Plate 1). This is therefore the distance that has been used throughout this HRA in order to determine whether Habitats sites are likely to be significantly affected by development under the Horsford NP.

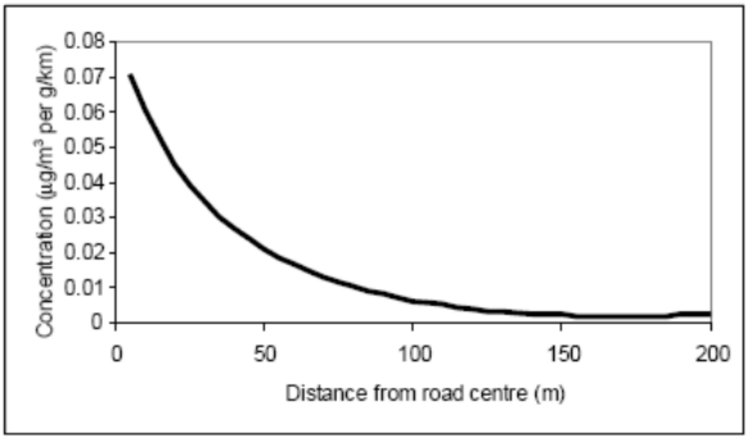

Plate 2 Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)

4.22 The GNLP's HRA also discusses air pollution in relation to growth across the GNLP area and states that there will be no impact. Therefore, the Neighbourhood Plan will also not impact Habitat sites regarding air pollution.

5. Test of Likely Significant Effects (ToLSE) - Screening

Introduction

5.1 When seeking to identify relevant Habitat sites, consideration has been given primarily to identified impact pathways and the source-pathway-receptor approach, rather than adopting purely a ‘zones’-based approach. The source-pathway-receptor approach is a standard tool in environmental assessment. In order for an effect to occur, all three elements of this mechanism must be in place, whereas the absence of one or more of the elements means there is no possibility for an effect. Furthermore, even where an impact is predicted to occur, it may not result in significant effects (i.e., those which undermine the Conservation Objectives of a Habitats site).

5.2 The likely zone of impact (also referred to as the likely Zone of Influence, ZoI) of a plan or project is the geographic extent over which significant ecological effects are likely to occur. The ZoI of a plan or project will vary depending on the specifics of a particular proposal and must be determined on a case-by-case basis with reference to a variety of criteria, including:

- the nature, size / scale and location of the plan;
- the connectivity between the plan and Habitat sites, for example through hydrological connections or because of the natural movement of qualifying species;
- the sensitivity of ecological features under consideration; and,
- the potential for in-combination effects.

Approach to Horsford Neighbourhood Plan Policy Screening

5.3 There are 19 policies within the Horsford NP. Policies were screened out of having LSEs on a Habitat site where any of the following reasons applied:

- they are environmentally positive;
- they will not themselves lead to any development or other change;
- they make provision for change but could have no conceivable effect on a Habitat site. This can be because there is no pathway between the policy and the qualifying features or a Habitat site, or because any effect would be positive;
- they make provision for change but could have no significant effect on a Habitat site (i.e., the effect would not undermine the conservation objectives of a Habitat site); or,
- the effects of a policy on any particular Habitat site cannot be ascertained because the policy is too general. For example, a policy may be screened out if, based on absence of detail in the policy, it is not possible to identify

where, when, or how the policy may be implemented, where effects may occur, or which sites, if any, may be affected.

5.4 Any 'criteria-based' policy (i.e., those that simply list criteria with which development needs to comply) or other general policy statements that have no spatial element were also screened out. Likewise, policies that simply 'safeguard' an existing resource (e.g., existing green infrastructure or mineral resources) by preventing other incompatible development, were also screened out.

5.5 The appraisal therefore focussed on those policies with a definable spatial component. Having established which policies required scrutiny by virtue of being spatially defined, consideration was given as to whether LSEs could be dismissed due to a lack of connectivity to any Habitat site for one of the following reasons:

- a potentially damaging activity may occur as a result of the policy but there is no pathway connecting it to a Habitat site (due to distance, for example);
- there are no Habitat sites vulnerable to any of the activities that the policy will deliver; or,
- the policy will not result in any damaging activities.

5.6 The initial scoping of Habitat sites identifies that potential vulnerabilities exist in relation to:

- Recreational pressure; and
- Nutrient Neutrality (water pollution).

5.7 After an initial investigation into linking impact pathways, the following Habitats sites have been screened out as having no linking impact pathways:

- Norfolk Valley Fens SAC

Results of Policy Screening

5.8 The results of the LSEs screening of policies included in the Horsford NP are presented in Table 5, Appendix B. Where a policy is shaded green, there are no linking impact pathways to Habitat sites and LSEs can be excluded. Where the screening outcome is shaded orange, LSEs cannot be excluded, and the policy is screened in for AA.

5.9 Of the 19 Horsford NP policies, three are considered to have the potential to result in LSEs, alone and therefore or in combination with other plans and projects, as such an Appropriate Assessment is required. These are:

- Policy SS1: Settlement Limit - The Neighbourhood Plan defines the settlement boundary of Horsford, as shown on the Policies Map, to manage development proposals in accordance with strategic policies for settlements and the countryside.
- Policy SS2: New Development - The Neighbourhood Plan allocates land to the east of the village centre and south of Holt Road, as shown on the Policies Map, for a mixed-use development scheme comprising:

  - A sports hub on land south of Holt Road for sport and recreation uses;
  - A community hub building on land to the east of the village centre for a mix of local community facility uses; and
  - An enabling residential scheme on land to the east of the village centre of approximately 300 dwellings comprising open market and affordable homes in accordance with the Greater Norwich Local Plan requirements. Serviced plots for self-build or custom build homes will also be supported
- Policy BUS1: New Business – The neighbourhood plan offers support for the retention and creation of employment within the Neighbourhood Plan area and gives guidance on the types of development which will be supported or discouraged.

5.10 Each of the above policies will be discussed further within the 'in combination' section of the appropriate assessment in relation to the following Habitats sites.

Broadland SPA and Ramsar

5.11 The Broadland SPA / Ramsar is located east of the parish of Horsford. They have been identified to be vulnerable to **increased disturbance through recreational pressure**.

River Wensum SAC

5.12 The River Wensum SAC is located west of the parish of Horsford. It has been identified to be vulnerable to increased disturbance through **nutrient neutrality (water pollution).**

The Broads SAC

5.13 The Broads SAC is located east of the parish of Horsford. It has been identified to be vulnerable to increased disturbance through **nutrient neutrality (water pollution).**

6. Appropriate Assessment In-combination

Introduction

6.1 The law does not prescribe how an AA should be undertaken or presented, but it must consider all impact pathways that have been screened in, whether they arise alone or in combination with other projects and plans. That analysis is the purpose of this section. The law does not require the different effects to be examined separately provided all effects are discussed.

6.2 The HRA screening exercise undertaken in Table 5, Appendix B indicates that three policies, one of which refers to site allocations, were considered to pose LSEs to Habitats sites, either alone or in combination with other projects and plans, due to contributing to one or more of the following impact pathways: recreational pressure and water pollution (Nutrient Neutrality).

6.3 This assessment is undertaken for the Neighbourhood Plan 'in combination' with other plans and projects since the Neighbourhood Plan alone is unlikely to result in adverse effects on integrity of any Habitats Sites given the distance from those sites and the relatively modest number of dwellings allocated.

Recreational Pressure (In-Combination)

Broadland SAC and Ramsar

6.4 The Horsford NP proposes to deliver 300 new homes over the plan period. In the wider area, the GNLP identifies a housing need of 40,541 homes between 2018 and 2038[35].

6.5 The Habitats Regulations Assessment of the adopted Greater Norwich Local Plan states that in-combination recreational pressure mitigation will be required for all development for The Broads SAC, Broadland SPA and Broadland Ramsar. The Green Infrastructure and Recreational Impact Avoidance Strategy (GIRAMS) includes a tariff-based payment taken from residential accommodation that is used to fund packages of avoidance and mitigation measures to be delivered at Habitat sites. The tariff payment (currently £221.17 per dwelling, reviewed every April) is in place across all Norfolk Local Authorities.

6.6 Additionally to payment of the tariff, the HRA states that all development must provide proportionate green space within the bounds of the development to minimise any predicted increase in recreational pressure on Habitat sites as per Policy 3 in the GNLP. This advice applies across Norfolk because Natural England considers that development anywhere in the county could have a likely significant effect on a Habitat site in Norfolk. Development sites too small to provide onsite green infrastructure will be required to contribute financially to strategic green infrastructure via a Section 106 (S106) agreement.

6.7 Finally, the HRA mentions that a new Country Park created by Broadland District Council between Felthorpe and Horsford opened in March 2021. This park is north of Horsford parish. The location is close to the Norwich Growth Triangle, and the site is designed and managed to attract a larger number of recreational visitors. The Country Park will also reduce visitor pressure on European sites by providing an attractive alternative.

6.8 Any residential development at Horsford will be required to provide an onsite Suitable Alternative Natural Greenspace (SANG) or financial contribution via a S106 agreement and pay into the GIRAMS tariff. Since this is a requirement applicable across Norfolk it does not need to be contained in Neighbourhood Plan policy. However, Policy SS2 does include a clause that '*The enabling residential scheme shall also make provision for community gardens and allotments, address potential visitor pressure that would detrimentally impact the Broadlands SPA and Ramsar, and offset any nutrient neutrality impacts in accordance with Policy 3 of the Greater Norwich Local Plan, or any subsequent replacement.*'

[35] https://www.gnlp.org.uk/

6.9 In addition to a financial contribution to the GIRAMS tariff, the planned new housing development east of the village centre also includes planned recreational green spaces including:

- The Green – Existing arable land to become approximately 2.1 Ha of green space
- Green Avenue – Approximately 350m of existing arable land to become a tree lined pathway linking The Green to the upper section of the development and the Diamond Jubilee Plantation to the north east.
- Diamond Jubilee Plantation link – Pathways through grassland and new ponds connecting the new development and Horsford to the diamond Jubilee Plantation woodland.

Water Quality - Nutrient Neutrality

6.10 Policy SS2 includes a clause that 'The enabling residential scheme shall also make provision for community gardens and allotments, address potential visitor pressure that would detrimentally impact the Broadlands SPA and Ramsar, and offset any nutrient neutrality impacts in accordance with Policy 3 of the Greater Norwich Local Plan, or any subsequent replacement.' This suggests that in order for any new development to be granted planning permission, they must show that nutrient neutrality has been considered and offset within the design.

6.11 A calculator has been developed by Norfolk Authorities to assess the level of increase in nitrate and phosphate production by developments in direct relation to the River Wensum SAC and Broads SAC.

6.12 The proposed development's nutrient impact has been calculated using the initial information provided by the Parish within the Norfolk specific Calculator to provide a necessary precautionary estimate of nutrient neutrality mitigation. It should be noted that nutrient neutrality calculations will need to be updated as the proposed development's design advances.

6.13 Several assumptions have been made in order to undertake this calculation; these are:

- Wastewater treatment works – Reepham Water Recycling Centre.
- Current land use – cereals (19.0 ha), lowland grassland (2.6 ha) and residential urban land (0.2 ha).
- Future land use – Medium intensity urban land (9 ha) and Greenspace (12.8 ha).
- No SuDS information has been provided, so none has been entered.

6.14 These are intended as preliminary calculations only. The developer, in accordance with Policy SS2 and Greater Norwich Local Plan, should provide a fully updated calculation to support a planning application.

6.15 The full preliminary calculation is shown in Appendix C and the output of the budget calculator is provided below:

Table 3 Total nutrient budget for the development site pre and post 2030

Total nutrient budget for the development site	Current	Post 2030
Total phosphorous budget for the site	25.39 Kg/year	8.98 Kg/year
Total nitrogen budget for the site	188.80 Kg/year	-204.46 Kg/year

Table 4 Requirement for mitigation to offset phosphate and nitrate pre and post 2020

Phosphate	Current	Additional phosphate generated	Mitigation required
	Post 2030	Additional phosphate generated	Mitigation required
Nitrate	Current	Additional nitrate generated	Mitigation required
	Post 2030	Development will be Nitrate neutral	No mitigation required

7. Conclusions

7.1 The Horsford Neighbourhood Plan has a total of 19 policies. Of these policies three had the potential to cause a likely significant effect and were discussed with regards to their impacts upon Habitat sites. These were:

- Policy SS1: Settlement Limit
- Policy SS2: New Development - The Neighbourhood Plan allocates land to the east of the village centre and land south of Holt Road, as shown on the Policies Map, for a mixed-use development scheme comprising:
- A sports hub on land south of Holt Road for sport and recreation uses;
- A community hub building on land to the east of the village centre for a mix of local community facility uses; and
- An enabling residential scheme on land to the east of the village centre of approximately 300 dwellings comprising open market and affordable homes in accordance with the Greater Norwich Local Plan requirements. Serviced plots for self-build or custom build homes will also be supported
- Policy BUS1: New Business

7.2 The test of likely significant effects focused on the above policies with regards to the vulnerabilities of the Habitat sites within Table 1. The impact pathways relating to the Habitat sites vulnerabilities are listed below:

- Recreational pressure; and
- Water quality (Nutrient Neutrality)

7.3 The policies were found to have a potential likely significant effect upon the Habitat sites within Table 1 with regards to the following impact pathways; recreational pressure and water quality (nutrient neutrality) in combination with other plans and projects. These pathways and the policies were discussed within the Appropriate Assessment.

7.4 The overarching Local Plan – Greater Norwich Local Plan (GNLP), adopted on March 28th, 2024, was considered to provide protective policies (e.g. Policy 3. Environmental Protection and Enhancement) for Habitat sites, coupled with the requirements of Policy SS2 of the Horsford NP. This requires any residential developer to address recreational pressure and nutrient issues related to European sites in Norfolk. The developer(s) for the 300 dwellings to be delivered at Horsford will be required to provide a financial contribution to the Norfolk-wide recreation management strategy known as the GIRAMS but will also be providing greenspace on site. The developer(s) will also need to provide mitigation for nutrient neutrality up to 2030, based on current designs. This is also a requirement of Horsford NP Policy SS2.

7.5 As a result it can be concluded that the Horsford NP would not adversely impact Habitat sites either alone or in-combination with other plans and projects.

Appendix A - European Sites Background

A.1 The Broads SAC

Conservation Objectives

7.6 With regard to the SAC[36] and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

7.7 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.

Qualifying Features

- Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.; Calcium-rich nutrient-poor lakes, lochs and pools
- Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation; Naturally nutrient-rich lakes or lochs which are often dominated by pondweed
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows
- Transition mires and quaking bogs; Very wet mires often identified by an unstable \`quaking\` surface
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Calcium-rich fen dominated by great fen sedge (saw sedge)
- Alkaline fens; Calcium-rich springwater-fed fens
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); Alder woodland on floodplains
- Desmoulin\`s whorl snail *Vertigo moulinsiana*
- Otter *Lutra lutra*

[36] Natural England, 2018. The Broads SAC Conservation Objectives. Accessed 17/01/2025 via: The Broads SAC Conservation Objectives (publications.naturalengland.org.uk)

- Fen orchid *Liparis loeselii*
- Little whorlpool ram's-horn snail *Anisus vorticulus*

Environmental Vulnerabilities

7.8 With regards to this SAC and others included within the Broadland 2018 SIP[37] the following are threats and pressure listed for those sites:

- Water pollution
- Climate change
- Invasive species
- Siltation
- Inappropriate water levels
- Hydrological changes
- Water abstraction
- Change in land management
- Inappropriate ditch management
- Inappropriate scrub control
- Changes in species distributions
- Public access/disturbance
- Under grazing
- Drainage
- Direct impact from third party
- Inappropriate coastal management
- Air pollution: impact of atmospheric nitrogen deposition

7.9 The 2019 Supplementary Advice to the Conservation Objectives[38] (SACO) goes into more detail on these vulnerabilities.

A.2 Broadland SPA and Ramsar

Conservation Objectives

7.10 With regard to the SPA[39] and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

7.11 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;

[37] Natural England, 2018. Broadlands Site Improvement Plan. Accessed 17/01/2025 via: Broadland SIP (publications.naturalengland.org.uk)
[38] Natural England, 2019. The Broads SAC Supplementary Advice on Conservation Objectives. Accessed 17/01/2025 via: The Broads SAC SACO (publications.naturalengland.org.uk)
[39] Natural England, 2019. Broadland SPA Conservation Objectives. Accessed 17/01/2025 via: Broadland SPA Conservation Objectives (publications.naturalengland.org.uk)

- 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.

Qualifying Features

7.12 With regards to the SPA the following are reasons for designation:

- Botaurus stellaris; Great bittern (Breeding)
- Bewick's swan *Cygnus columbianus bewickii*; (Non-breeding)
- Whooper swan *Cygnus cygnus*; (Non-breeding)
- Eurasian wigeon *Anas penelope;* (Non-breeding)
- Gadwall *Anas strepera*; (Non-breeding)
- Northern shoveler *Anas clypeata*; (Non-breeding)
- Eurasian marsh harrier *Circus aeruginosus;* (Breeding)
- Hen harrier *Circus cyaneus;* (Non-breeding)
- Ruff *Philomachus pugnax*; (Non-breeding)

7.13 With regards to the Broadland Ramsar[40] the following are reasons for designation:

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* Calcium-rich fen dominated by great fen sedge (saw sedge).

Alkaline fens Calcium-rich springwater-fed fens.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) Alder woodland on floodplains, and the Annex II species

Desmoulin`s whorl snail *Vertigo moulinsiana*

Otter *Lutra lutra*

Fen orchid *Liparis loeselii*

Ramsar Criterion 6 – species/populations occurring at levels of international importance.

– Qualifying Species/populations (as identified at designation):

[40] Joint Nature Conservation Committee, 2008. Broadland Ramsar Information Sheet. Accessed 17/01/2025 via: Broadland Ramsar Information Sheet (jncc.gov.uk)

– Species with peak counts in winter:

Tundra swan, *Cygnus columbianus*, NW Europe – 196 individuals, representing an average of 2.4% of the GB population

Eurasian wigeon, *Anas penelope*, NW Europe – 6769 individuals, representing an average of 1.6% of the GB population

Gadwall, *Anas strepera*, NW Europe – 545 individuals, representing an average of 3.1% of the GB population

Northern shoveler, *Anas clypeata*, NW & C Europe – 247 individuals, representing an average of 1.6% of the GB population

– Species/populations identified subsequent to designation for possible future consideration under criterion 6:

– Species with peak counts in winter:

Pink-footed goose, *Anser brachyrhynchus*, Greenland, Iceland/UK – 4263 individuals, representing an average of 1.7% of the population

Greylag goose, *Anser anser*, Iceland/UK, Ireland – 1007 individuals, representing an average of 1.1% of the population

Environmental Vulnerabilities

– With regards to this SPA and others included within the Broadland 2018 SIP[41] the following are threats and pressure listed for those sites:

- Water pollution
- Climate change
- Invasive species
- Siltation
- Inappropriate water levels
- Hydrological changes
- Water abstraction
- Change in land management
- Inappropriate ditch management
- Inappropriate scrub control
- Changes in species distributions
- Public access/disturbance
- Under grazing
- Drainage
- Direct impact from third party
- Inappropriate coastal management

[41] Natural England, 2014. Broadland Site Improvement Plan. Accessed 17/01/2025 via: Broadland SIP (publications.naturalengland.org.uk)

- Air pollution: impact of atmospheric nitrogen deposition

– The 2019 Supplementary Advice to the Conservation Objectives[42] (SACO) goes into more detail on these vulnerabilities.

A.3 Norfolk Valley Fens SAC

Conservation Objectives

7.14 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

7.15 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.

Qualifying Features

- Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath
- European dry heaths
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Calcium-rich fen dominated by great fen sedge (saw sedge)
- Alkaline fens; Calcium-rich springwater-fed fens
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); Alder woodland on floodplains
- Narrow-mouthed whorl snail *Vertigo angustior*
- Desmoulin`s whorl snail *Vertigo moulinsiana*

[42] Natural England, 2019. Broadland SPA Supplementary Advice on Conservation Objectives. Accessed17/01/2025 via: Broadland SPA SACO (publications.naturalengland.org.uk)

Environmental Vulnerabilities

7.16 With regards to this SAC's SIP the following are threats and pressure listed for the site:

- Inappropriate water levels
- Inappropriate scrub levels
- Hydrological changes
- Water pollution
- Inappropriate cutting/mowing
- Water abstraction
- Under grazing
- Overgrazing
- Invasive species
- Change in land management
- Changes in species distributions
- Air pollution: impact of atmospheric nitrogen deposition

7.17 The 2019 Supplementary Advice to the Conservation Objectives (SACO) goes into more detail on these vulnerabilities.

A.4 River Wensum SAC

Conservation Objectives

7.18 With regard to the SAC[43] and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

7.19 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.

[43] Natural England, 2018. River Wensum SAC Conservation Objectives. Accessed 17/01/2025 via: River Wensum SAC Conservation Objectives (publications.naturalengland.org.uk)

Qualifying Features

Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; Rivers with floating vegetation often dominated by water-crowfoot

Desmoulin`s whorl snail *Vertigo moulinsiana*

White-clawed (or Atlantic stream) crayfish *Austropotamobius pallipes*

Brook lamprey *Lampetra planeri*

Bullhead *Cottus gobio*

Environmental Vulnerabilities

7.20 With regards to this SAC's SIP[44] the following are threats and pressure listed for the site:

- Physical modification
- Inappropriate weirs, dams, and other structures
- Siltation
- Invasive species
- Water pollution
- Water abstraction

7.21 The 2019 Supplementary Advice to the Conservation Objectives[45] (SACO) goes into more detail on these vulnerabilities.

[44] Natural England, 2014. River Wensum Site Improvement Plan. Accessed 17/01/2025 via: River Wensum SIP (publications.naturalengland.org.uk)

[45] Natural England, 2019. River Wensum SAC Supplementary Advice on Conservation Objectives. Accessed 17/01/2025 via: River Wensum SAC SACO (publications.naturalengland.org.uk)

Appendix B Policy Screening

Table 5 Horsford Neighbourhood Plan Policy Screening

Policy Name	Policy summary (full policy details can be found in the NP document)	Potential Likely Significant Effect?
Spatial Strategy		
SS1: Settlement Limit	This policy defines the settlement boundary of Horsford, as shown on the Policies Map, to manage development proposals in accordance with strategic policies for settlements and the countryside.	**Likely Significant Effects** Although the policy does not promote a quantum of development in any one area the policy does define areas of countryside where development will be permitted. Depending on the location of the development the increase in housing within the Parish could potentially create the following source receptor impact pathways: • Recreational Pressure • Water Resources: Nutrient Neutrality
SS2: New Development	The Plan will allocate s land for mixed use development as shown on the policies map. It provides guidance and detail in relation to the development of: • A sports hub • A community hub • A residential scheme	**Likely significant effects.** Depending on the location and size of the development the increase in housing within the Parish could potentially create the following source receptor impact pathways: • Recreational Pressure • Water Resources: Nutrient Neutrality
Community		
COM1: Community Facilities and Local Services	This policy relates to the defining of and application of planning policy to community facilities, as shown in thePolicies Maps.	**No likely significant effects.** The policy is a community building management policy and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
COM2: Early Years Provision	This policy supports retention of early years provision facilities.	No likely significant effects. The policy is an early year's provision policy and does not allocate specific sites for development. There are no

Policy Name	Policy summary (full policy details can be found in the NP document)	Potential Likely Significant Effect?
		pathways linking this policy to any Habitat sites.
COM3: Allotments	This policy relates to the provision of allotments as part of large developments.	No likely significant effects. The policy is an allotment provision policy and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
Housing and The Built Environment		
HBE1: Mixed Housing	This policy provides guidance on the requirements to provide mixed type and tenure of housing to meet the needs of the community.	No likely significant effects. The policy is a development management policy and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
HBE2: Horsford Design Code	This policy requires developments to be aesthetically appropriate within their surroundings.	No likely significant effects. The policy relates to the aesthetics of new developments and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
HBE3: Locally Important Buildings	This policy identifies buildings and structures as Locally Important Buildings, as shown on the Policies Map, and offers them protiection form general development.	No likely significant effects. The policy relates to management of existing buildings and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
HBE4: Addressing the Performance Gap	This policy sets out requirements with regard to building codes and sustainability.	No likely significant effects. The policy relates to building codes and sustainability and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
Transport and Access		
TRA1: Sustainable Travel	This policy describes and offers protection to the integrity of the sustainable travel network within the Neighbourhood Plan area.	No likely significant effects. The policy relates to the travel network and does not allocate specific sites for

Policy Name	Policy summary (full policy details can be found in the NP document)	Potential Likely Significant Effect?
		development. There are no pathways linking this policy to any Habitat sites.
TRA2: Public Parking for Non-residential Use	This policy provides guidance for the provision of parking.	No likely significant effects. The policy relates to the provision of parking within developments and does not allocate specific sites for development. There are no pathways linking this policy to any Habitat sites.
Environment and Landscape		
ENV1: Green Infrastructure Network	This policy defines and provides support for local blue and green infrastructure.	No Likely Significant Effects This policy is a strategic development management policy that sets out green infrastructure policy. The policy does not have any linking impact pathways.
ENV2: Local Green Space	This policy designates a number of Local Green Spaces, as shown on the Policies Map, which are protected from general development	No Likely Significant Effects This policy is a strategic development management policy that sets out green space policy. The policy does not have any linking impact pathways.
ENV3: Views and Vistas	This development management policy relates to protecting local views that are off particular community importance.	No Likely Significant Effects This policy is a strategic development management policy that seeks to protect local views and does not encourage development. The policy does not have any linking impact pathways.
ENV4: Protecting the Setting of Horsford	This policydefines land to the north of the Broadland Northway (A1270), as shown on the Policies Map, as a Local Green Gap which will be protected.	No Likely Significant Effects This policy is a strategic development management policy that seeks to protect open countryside by designating a Local Green Gap.

Policy Name	Policy summary (full policy details can be found in the NP document)	Potential Likely Significant Effect?
		The policy does not have any linking impact pathways.
ENV5: Street Lighting	This policy provides guidance on street lighting requirements.	No Likely Significant Effects This policy is a strategic development management policy relating to the use of street lighting. The policy does not have any linking impact pathways.
Business and Employment		
BUS1: New Business	This policy offers support for the retention and creation of employment within the Neighbourhood Plan area and gives guidance on the types of development which will be supported or discouraged.	**Likely Significant Effects** Although the policy does not promote a quantum of development in any one area the policy does highlight areas where it will prioritise certain type of employment development. Depending on the location of the development the increase in employment development within the Combined Authority could potentially create the following source receptor impact pathways: • Recreational Pressure • Water Resources: Nutrient Neutrality
Infrastructure		
INF1: Developer Contributions	This policy outlines requirements for developer contributions to the range of planning obligations for infrastructure.	**No Likely Significant Effects** This policy is a strategic development management policy relating to planning obligations to developers. The policy does not have any linking impact pathways.
INF2: Digital Infrastructure	This policy provides requirements for telecommunications infrastructure associated with residential and employment developments.	**No Likely Significant Effects** This policy is a strategic development management policy relating to provision of fibre. The policy does not have any linking impact pathways.

Appendix C Nutrient Neutrality calculation

Stage 4 **Calculate the net change in nutrient load from the proposed development**

Note: This stage calculates the net change in TP and TN load to the catchment from the proposed development. This is derived by calculating the difference between the load calculated for the proposed development (wastewater, urban area, open space, etc.) and that for the existing land uses. The nutrient budget for the site has been calculated under current and post-2025 WRC permit levels, where applicable. The nutrient budgets under proposed Post 2030 permit limits are for guidance purposes only until the permit limits are put into legislation.

		Current	Post 2030		Summary	
					No. of dwellings	300
1.	Identify the load from additional population	Value	Value	Unit	WRC location	Reepham Water Recycling Centre
					Current TP discharge concer	0.83
	TP Loading from additional population	**18.77**	**5.09**	**kg/year**	Current TN discharge concei	25.00
	TN Loading from additional population	**565.30**	**203.51**	**kg/year**		
					Post 2030 TP discharge conc	0.23
					Post 2030 TN discharge con	9.00
2.	Calculate net change in nutrient load from land use change	Value	Value	Unit	TP current land use	1.23
	TP load from land use change	**2.39**	**2.39**	**kg/year**	TP proposed land use	3.62
	TN load from land use change	**-407.96**	**-407.96**	**kg/year**	TN current land use	497.95
					TN proposed land use	89.98
3.	Calculate nutrient budget for the development site	Value	Value	Unit		
	TP budget for the site	**21.16**	**7.48**	**kg/year**		
	TN budget for the site	**157.33**	**-204.46**	**kg/year**		
4.	Calculate precautionary buffer	Value	Value	Unit		
	Buffer amount	20	20	%		
	TP Precautionary buffer	**4.23**	**1.50**	**kg/year**		
	TN Precautionary buffer	**31.47**	**0.00**	**kg/year**		

Note: The figures used throughout this model are based on scientific research, evidence and modelled catchments and represent the best available evidence. However, it is important that a precautionary buffer is used that recognises the uncertainty with these figures and ensures, with reasonable certainty, that there will be no adverse effect on site integrity. As such, a 20% precautionary buffer added to the nutrient budget.

5.	**Total nutrient budget for the development site**	Value		Unit
	Total Phosphorus budget for the site	**25.39**	**8.98**	**Kg/year**
	Total Nitrogen budget for the site	**188.80**	**-204.46**	**Kg/year**

Plate 3 Nutrient neutrality calculation

aecom.com

aecom.com