Bungay Neighbourhood Plan

Habitats Regulations Assessment

Bungay Neighbourhood Plan Group

June 2021

Quality information

Prepared by	Checked by	Verified by	Approved by
Nicholas Braybrook Ecologist	Isla Hoffmann Heap Senior Ecologist	James Riley Technical Director	James Riley Technical Director

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Prepared for:

Bungay Neighbourhood Plan Group

Prepared by:

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

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

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1. Introduction

Project Scope

1.1 AECOM has been commissioned by Bungay Neighbourhood Plan Group to undertake a Habitats Regulations Assessment of the emerging Bungay Neighbourhood Development Plan (BNDP), which covers the vision for the Parish between 2020 and 2036. Neighbourhood planning was introduced through the Localism Act 2011 to give local communities the opportunity to help shape community development over the plan period. The BNDP sets out planning policies that will be used to review planning applications, alongside the adopted policies in the overarching Broads Local Plan and the Waveney Local Plans. Neighbourhood Plans are obligated to support the delivery of strategic policies set out in Local Plans and need to be in conformity with such strategic policies.

1.2 Bungay is a market town situated at the northern boundary of Suffolk with a population of 4,895. It is located 15 miles to the south of Norwich and 15 miles to the south-west of Lowestoft, at the neck of a meander of the River Waveney. The town developed at the southern bank of River Waveney around the historic castle and bloomed through river trade in the 17th century. It continued growing in the 19th century with its industries and expanded towards south with further housing in the 20th century. Bungay is well connected to the surrounding cities, towns and villages via A143 and A144. It has bus services to Beccles, Halesworth and Norwich where the nearest access to the railway services are. As a market town, Bungay serves a number of surrounding villages and rural communities.

1.3 The Waveney Local Plan (WLP) identifies Bungay as providing approx. 6% of the Borough's housing growth. the BNDP plans to deliver an additional 75 new dwellings on the land to the east of St Margaret's road (Appendix A).

1.4 An HRA is required under the terms of the Conservation of Habitats & Species Regulations 2017 (as amended) to assess whether any policies of development plans may have Likely Significant Effects (LSEs) and, ultimately, the potential to cause adverse effects on the integrity of Natura 2000 or European Designated Sites (Special Areas of Conservation, SACs, Special Protection Areas, SPAs, and Ramsar sites designated under the Ramsar convention), either in isolation or in combination with other plans and projects. If this is the case, this HRA will evaluate whether site-specific or policy mitigation measures are required.

Legislation

1.5 The UK left the EU on 31 December 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). The Withdrawal Act retains the body of existing EU-derived law within our domestic law.

1.6 The need for HRA is set out within the Conservation of Habitats & Species Regulations 2017 (as amended) and concerns the protection of European sites (Figure 1). European sites (also called Natura 2000 sites) can be defined as actual or proposed/candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). It is also Government policy for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Natura 2000 sites.

1.7 The HRA process applies the precautionary principle to protected areas. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

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 purpose of the assessment under regulation 105…* [which sets out the formal process for determination of 'likely significant effects' and the appropriate assessment']*."*

Figure 1: The legislative basis for HRA.

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

- To assist the Qualifying Body (Bungay Neighbourhood Plan Group) in preparing their plan by recommending (where necessary) any adjustments required to protect European sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and
- On behalf of the Qualifying Body, to assist the overarching Local Planning Authority (Waveney Council and The Broads Authority as appropriate) 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. 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 The Habitats Regulations applies the precautionary principle to international sites: SAC, SPA, and Ramsar. For the purposes of this assessment candidate SACs (cSACs), proposed SPAs (pSPAs) and proposed Ramsar (pRamsar) sites are all treated as fully designated sites.

1.11 Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. This contrasts with the SEA Directive which does not prescribe how plan or programme proponents should respond to the findings of an environmental assessment; merely that the assessment findings (as documented in the 'environmental report') should be 'taken into account' during preparation of the plan or programme.

1.12 Over the years, 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

2. Methodology

Introduction

2.1 Figure 2 below outlines the stages of HRA according to current Ministry of Housing, Communities and Local Government guidance. 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.

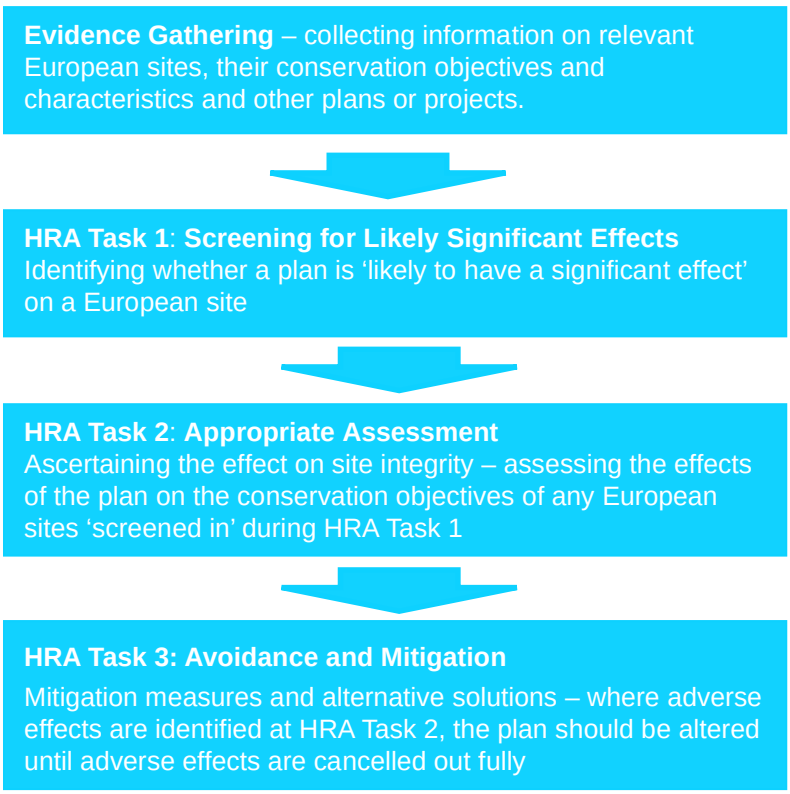

Figure 2: Four Stage Approach to Habitats Regulations Assessment. Source GOV.UK, 2019.

HRA Task 1 – Likely Significant Effects (LSE)

2.2 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) 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?*"

2.3 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 European sites, usually because there is no mechanism for an adverse interaction with European sites. This stage is undertaken in Chapter 5 of this report.

HRA Task 2 – Appropriate Assessment (AA)

2.4 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 not 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.

2.5 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate assessment[1]. Paragraph: 001 Reference ID: 65-001-20190722m 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*'.

2.6 As this analysis follows on from the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment takes any policies or allocations that could not be dismissed following the high-level screening analysis and analyses the potential for an effect in more detail, with a view to concluding whether there would be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).

2.7 A decision by the European Court of Justice[2] concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may no longer be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. The UK is no longer part of the European Union. However, as a precaution, it is assumed for the purposes of this HRA that EU case law regarding Habitat Regulations Assessment will still be considered informative jurisprudence by the UK courts. That ruling has therefore been considered in producing this HRA.

2.8 Also, in 2018 the Holohan ruling[3] was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that '*As regards other habitat types or species, which are present on the site, but for 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, if they are necessary to the conservation of the habitat types and species listed for the protected area*' [emphasis added]. This has been taken into account in the HRA, specifically in relation to the Broadland SPA / Ramsar and the Breydon Water SPA / Ramsar. Both sites are designated for mobile bird species, which are likely to routinely use habitats beyond the designated site boundary.

HRA Task 3 – Avoidance and Mitigation

2.9 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on European sites. There is considerable precedent concerning the level of detail that a Neighbourhood Plan document needs to contain regarding mitigation for recreational impacts on European 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.

2.10 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 details 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.

[1] https://www.gov.uk/guidance/appropriate-assessment#what-are-the-implications-of-the-people-over-wind-judgment-for-habitats-regulations-assessments [Accessed: 07/01/2020].
[2] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[3] Case C-461/17

Geographical Scope of the HRA

2.11 There are no standard criteria for determining the ultimate physical scope of an HRA of a development plan document such as a Neighbourhood Plan. However, generally it is uncommon for Development Plans to have a significant effect on European sites situated more than 10km distant. For example, the majority of core recreational catchments (except for some coastal sites) are under 10km in size, there are few wintering waterfowl and waders that make extensive use of functionally-linked land located more than 10km from their core areas, and the average vehicle commuting distance of a UK resident is approx. 10km. It should be noted that the presence of a conceivable impact pathway linking the emerging BNDP to a European site does not mean that Likely Significant Effects (LSEs) will occur.

2.12 In some cases, development impacts can extend beyond 10km, particularly where hydrological pathways are involved, which is why the source-pathway-receptor concept is also used to help determine whether there is any potential pathway connecting development to any European sites. This takes site-specific sensitivities into account, including issues such as nutrient neutrality or water levels, quantity, and flow. However, in the case of Bungay Parish it was considered that all potentially linked European sites where a Likely Significant Effect was conceivable were located within 10km of the parish.

2.13 The following European sites therefore require consideration in relation to Bungay Parish:

- Broadland SPA / Ramsar;
- The Broads SAC;

Confirming Other Plans and Projects That May Act ‘In Combination’

2.14 It is a requirement of the Regulations that the impacts of any development plans are not only considered in isolation but in-combination with other plans and projects that may also be affecting the European site(s) in question.

2.15 For example, when considering the potential for combined regional housing development across multiple local authorities to impact on European sites, a key emphasis must be on the cumulative impact of visitor numbers (i.e. recreational pressure). While one Parish might only contribute a minor portion of recreational pressure (with no negative impact on a European site), other adjacent Parishes may also each contribute minor ‘amounts’ of such pressure. Cumulatively, this could result in detectable effects on designated species. Evidence for in combination assessments of recreational pressure are typically available through bespoke visitor surveys commissioned by relevant stakeholders.

2.16 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 negligible.

3. European Sites

3.1 The European Sites described in the following have been identified based on a 10km search around the boundary of Bungay Parish on the basis that experience indicates development of the type covered by the Neighbourhood Plan is unlikely to present significant impact pathways at greater distances (Appendix B). The inclusion of European sites in this chapter does not mean that there necessarily is an impact pathway linking to the BNDP, nor that the Plan will result in Likely Significant Effects (LSEs) on these sites.

Broadland SPA / Ramsar

Introduction

3.2 The Broadland SPA / Ramsar comprises a low-lying wetland straddling the border between east Norfolk and northern Suffolk. It is a floodplain of five river systems including the Bure, Yare and Waveney and their major tributaries. The area represents one of the highest quality marshland complexes in the UK with a mosaic of wetland habitats, including open water, reedbeds, carr woodland, grazing marsh, tall herb fen, transition mire and fen meadow. In turn this wetland complex sustains an internationally important assemblage of breeding and non-breeding raptors and waterbirds. The estuary at the mouth of the Broadlands SPA / Ramsar is Breydon Water, another SPA / Ramsar. Both breeding and non-breeding bird features spend time on feeding areas outside the designated site boundary.

SPA Qualifying Features[4]

3.3 The Broadland SPA is designated for the following Annex I species:

- Great bittern *Botaurus stellaris*; 2-3 individuals comprising 10-15% of the GB population
- Bewick's swan *Cygnus columbianus bewickii*; 495 individuals, comprising 7.1% of the GB population
- Whooper swan *Cygnus Cygnus Cygnus*; 121 individuals, comprising 1.8% of the GB population
- Marsh harrier *Circus aeruginosus*; 16 individuals, comprising 16% of the GB population
- Hen harrier *Circus cyaneus*; 22 individuals, comprising 3% of the GB population
- Ruff *Philomachus pugnax*; 96 individuals, comprising 6.4% of the GB population

Ramsar Qualifying Features[5]

3.4 The site is designated as a Ramsar for its following criteria:

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:

- H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* Calcium-rich fen dominated by great fen sedge (saw sedge).
- H7230 Alkaline fens Calcium-rich springwater-fed fens.

[4] Available at: https://secure.broadland.gov.uk/MVM.DMS/Planning%20Application/724000/724798/20180194%20Environmental%20Statement%20Appendix%207_2%20SPA%20Citation%20&%20Natura%202000%20Form%20for%20Broadland%20SPA.pdf [Accessed on the 26/05/2021]

[5] Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11010.pdf [Accessed on the 14/09/2020]

- H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) Alder woodland on floodplains,

and the Annex II species:

- S1016 *Vertigo moulinsiana* Desmoulin`s whorl snail
- S1355 *Lutra lutra* Otter
- S1903 *Liparis loeselii* Fen orchid.

The site supports outstanding assemblages of rare plants and invertebrates including nine British Red Data Book plants and 136 British Red Data Book invertebrates.

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 196 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9- 2002/3)
- Eurasian wigeon, *Anas penelope*, NW Europe 6769 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
- Gadwall, *Anas strepera strepera*, NW Europe 545 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9- 2002/3)
- Northern shoveler, *Anas clypeata*, NW & C Europe 247 individuals, representing an average of 1.6% 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:

- Pink-footed goose, *Anser brachyrhynchus*, Greenland, Iceland/UK 4263 individuals, representing an average of 1.7% of the population (5 year peak mean 1998/9-2002/3)
- Greylag goose, *Anser anser anser*, Iceland/UK, Ireland 1007 individuals, representing an average of 1.1% of the population (Source period not collated)

SPA Conservation Objectives[6]

3.5 With regard to the SPA 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;

3.6 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.

[6] Available at: http://publications.naturalengland.org.uk/publication/5310905998901248 [Accessed on the 26/05/2021]

Threats / Pressures to Site Integrity[7]

3.7 Natural England's Site Improvement Plan for the Broadland SPA / Ramsar highlights the following threats and pressures to the site integrity:

- 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
- Undergrazing
- Drainage
- Direct impact from third party (Ministry of Defence)
- Inappropriate coastal management
- Air pollution: Impact from atmospheric nitrogen deposition

The Broads SAC

Introduction

3.8 The Broads SAC is a 5,889.43ha large site in East Anglia, comprising humid grassland (39%), broad-leave deciduous woodland (24%), bogs and marshes (19%) and inland water bodies (16%). It constitutes a variety of sensitive habitats, most of which are dependent on a consistent hydrological input. The SAC contains oligo-mesotrophic waters with *Chara* species. These waters are characterised by very clear water and a low nutrient content. They are also base-rich (generally calcium) and are usually confined to underlying areas of limestone. The Broads are the richest site for charophytes in Britain with a total of 20 recorded species.

3.9 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* also occur throughout the SAC. These have higher nutrient content than oligo-mesotrophic waterbodies, but still receive limited nutrient input from man-made sources. The eutrophic lakes have arisen from peat digging in medieval times and support relict vegetation of the original Fenland flora. The SAC contains one of the richest and rarest assemblages of aquatic species in the UK. Many of the Broads that have been affected by nutrient enrichment are now recovering.

3.10 The Broads SAC also supports the largest occurrence of calcareous fens outside of Sweden. The habitat for *Cladium* has diverse conditions that help support its species richness. The habitat type forms large-scale mosaics with other fen types (alkaline fens), open water and woodland with important associated plant species such as the fen orchid *Liparis loeselii*. Furthermore, The

[7] Available at: http://publications.naturalengland.org.uk/publication/5444118129934336 [Accessed on the 14/09/2020]

Broads SAC also supports the largest blocks of alder *Alnus glutinosa* woodland in England. Within the complex a complete successional sequence from open water, through reedswamp to alder woodland occurs. A wide range of flora inhabits this ecosystem, including uncommon species such as marsh fern *Thelypteris palustris*.

Qualifying Features[8]

3.11 Annex I habitats that are a primary reason for selection of this site:

- Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.
- Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* – type vegetation
- Transition mires and quaking bogs
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
- Alkaline fens
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

3.12 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

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

3.13 Annex II species that are a primary reason for selection of this site:

- Desmoulin's whorl snail *Vertigo moulinsiana*
- Fen orchid *Liparis loeselii*
- Ramshorn snail *Anisus vorticulus*

3.14 Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Otter *Lutra lutra*

Conservation Objectives[9]

3.15 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;

3.16 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.

[8] Available at: https://sac.jncc.gov.uk/site/UK0013577 [Accessed on the 14/09/2020]
[9] Available at: http://publications.naturalengland.org.uk/publication/6190476679970816 [Accessed on the 14/09/2020]

Threats / Pressure to Site Integrity[10]

3.17 Natural England's Site Improvement Plan for The Broads SAC identifies the following threats / pressure to site integrity:

- 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
- Undergrazing
- Drainage
- Direct impact from third party (Ministry of Defence)
- Inappropriate coastal management
- Air pollution: Impact from atmospheric nitrogen deposition

[10] Available at: http://publications.naturalengland.org.uk/publication/5444118129934336 [Accessed on the 14/09/2020]

4. Background to Relevant Impact Pathways

Recreational Pressure

Bird Disturbance

4.1 There is concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfill conservation objectives while also providing recreational opportunity. Various research reports have provided compelling links between changes in housing and access levels[11], and impacts on European protected sites[12] [13]. This applies to any habitat, but recreational pressure from housing growth is of particular significance for European sites designated for their bird interest. Different European sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex. HRAs of planning documents tend to focus on recreational sources of disturbance as a result of new residents[14].

4.2 Human activity can affect birds either directly (e.g. by eliciting flight responses) or indirectly (e.g. through damaging their habitat or reducing their fitness in less obvious ways e.g. stress). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to much subtler behavioural (e.g. alterations in feeding behaviour, avoidance of certain areas and use of sub optimal areas etc.) and physiological changes (e.g. an increase in heart rate). While these are less noticeable, they might result in major population-level changes by altering the balance between immigration / birth and emigration / death[15].

4.3 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[16]. Disturbance therefore risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect the 'condition' and ultimately survival of the birds. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they then must sustain a greater number of birds[17]. Moreover, the higher proportion of time a breeding bird spends away from its nest, the more likely it is that eggs will cool and the more vulnerable they, or any nestlings, are to predators. Recreational effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as stone curlew and nightjar[18] [19].

4.4 Several factors (e.g. seasonality, type of recreational activity) may have pronounced impacts on the nature of bird disturbance. Recreation disturbance in winter can be more impactful because food shortages make birds more vulnerable at this time of the year. In contrast, there are often fewer recreational users in the winter months and some effects of disturbance may be reduced

[11] 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
[12] Liley D, Clarke R.T., Mallord J.W., Bullock J.M. 2006a. The effect of urban development and human. disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Natural England / Footprint Ecology.
[13] Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. 2006b. Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology / Dorset County Council.
[14] The RTPI report 'Planning for an Ageing Population' (2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.
[15] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[16] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279
[17] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72
[18] Clarke R.T., Liley D., Sharp J.M., Green R.E. 2013. Building development and roads: Implications for the distribution of stone curlews across the Brecks. *PLOS ONE*. https://doi:10.1371/journal.pone.0072984.
[19] Liley D., Clarke R.T. 2003. The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. Biological Conservation 114: 219-230.

because birds are not breeding. Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance compared to hiking[20]. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers[21]. Furthermore, differences in on-site route lengths and usage patterns likely imply that key spatial and temporal parameters (such as the area of a site potentially impacted and the frequency of disturbance) will also differ between recreational activities. This suggests that activity type is a factor that should be taken into account in HRAs.

Non-breeding Birds (September to March)

4.5 Located 4.6km away from Bungay is the Broadland SPA / Ramsar designated site that is partly classified for overwintering birds, comprising mainly waterfowl such as Bewick's swan, whooper swan, gadwall and Northern shoveler. Therefore, this section focusses on academic research available on this group of birds.

4.6 Tuite et al[22] used a large (379 sites), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They determined that shoveler was one of the most sensitive species to recreational activities, such as sailing, windsurfing and rowing. Studies on recreation in the Solent have established that human leisure activities cause direct disturbance to wintering waterfowl populations[23] [24].

4.7 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 leads 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 for vehicle usage they also found that the density generally was lower along busier roads than quieter roads[25]. A study on Holt Heath noted reduced levels of fitness due to occupation of sub optimal habitats alongside roads amongst heathland species.

4.8 A study on recreational disturbance on the Humber[26] assesses different types of noise disturbance on waterfowl referring to previous research relating to aircraft (see Drewitt 1999[27]), traffic (Reijnen, Foppen, & Veenbaas 1997)[28], dogs (Lord, Waas, & Innes 1997[29]; Banks & Bryant 2007[30]) and machinery (Delaney et al. 1999; Tempel & Gutierrez 2003). It identifies that there is still relatively little work on the effects of different types of water-based craft and the impacts from jet skis, kite surfers, windsurfers etc (see Kirby et al. 2004[31] for a review). In general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size)

[20] Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* 3: 14pp.
[21] Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.
[22] 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
[23] Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary
[24] Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent disturbance and mitigation project – various reports.
[25] 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
[26] Helen Fearnley Durwyn Liley and Katie Cruickshanks (2012) Results of Recreational Visitor Survey across the Humber Estuary produced by Footprint Ecology
[27] Drewitt, A. (1999) Disturbance effects of aircraft on birds. English Nature, Peterborough.
[28] 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.
[29] 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.
[30] 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.
[31] 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.

is likely to influence the response (Delaney et al. 1999[32]; Beale & Monaghan 2005[33]). 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)[34].

4.9 Disturbing activities present themselves on a continuum. Generally, activities that involve irregular, infrequent and loud noise events, movement or vibration are likely to be the most disturbing. For example, the presence of dogs around water bodies generate substantial disturbance due the areas accessed and their impact on bird behaviour. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable and quiet patterns of sound, movement or vibration. The further any activity is from the birds, the less likely it is to result in disturbance. Overall, the factors that determine species responses to disturbance include species sensitivity, timing/duration of the recreational activity and the distance between source and receptor of disturbance.

4.10 The specific distance at which a species takes flight when disturbed is known as the 'tolerance distance' (also called the 'escape flight distance') and greatly differs between species. Tolerance distances from various literature sources are summarised in Table 1. It is reasonable to assume from this evidence that disturbance is unlikely to be relevant at distances of beyond 200m. Generally, tolerance distances are known for only few species and should not be extrapolated to other species.

Table 1: Tolerance distances in metres of 21 species of waterfowl to various forms of recreational disturbance, as described in the literature. Where the mean is not available, distances are provided as a range.[35]

Species	Type of disturbance. [1] Tydeman (1978), [2] Keller (1989), [3] Van der Meer (1985), [4] Wolff et al (1982), [5] Blankestijn et al (1986)		
	Rowing boats/kayak	Sailing boats	Walking
Little grebe		60 – 100 [1]	
Great crested grebe	50 – 100 [2]	20 – 400 [1]	
Mute swan		3 – 30 [1]	
Teal		0 – 400 [1]	
Mallard		10 – 100 [1]	
Shoveler		200 – 400 [1]	
Pochard		60 – 400 [1]	
Tufted duck		60 – 400 [1]	
Goldeneye		100 – 400 [1]	
Smew		0 – 400 [1]	
Moorhen		100 – 400 [1]	
Coot		5 – 50 [1]	
Curlew			211 [3]; 339 [4]; 213 [5]

[32] 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.
[33] 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.
[34] 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.
[35] Tydeman, C.F. 1978. Gravel Pits as conservation areas for breeding bird communities. PhD thesis. Bedford College
Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49: 31-45
Van der Meer, J. 1985. *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.
Wolf, W.J., Reijenders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107
Blankestijn, S. et al. 1986. Seizoensverbreding in de recreatie en verstoring van Wulp en Scholkester op hoogwatervluchplaatsen op Terschelling. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

Shelduck	148 [3]; 250 [4]
Grey plover	124 [3]
Ringed plover	121 [3]
Bar-tailed godwit	107 [3]; 219 [4]
Brent goose	105 [3]
Oystercatcher	85 [3]; 136 [4]; 82 [5]
Dunlin	71 [3]; 163 [2]

4.11 Mitigation measures to avoid recreational pressure effects usually involve a combination of access management, habitat management and provision of alternative recreational space. Access management (restricting access to some or all of a European site) is not typically within the remit of a Parish Council and may contravene a range of Government policies on access to open space and objectives for increasing exercise, improving health etc. However, active management of access may be possible, such as that practised on nature reserves. Habitat management also does not lie within the direct remit of Parish Councils. However, the Council can help to set a framework for improved habitat management by promoting collaboration with neighbouring parishes and Local Planning Authorities. Provision of alternative recreational space can help to attract recreational users away from sensitive European sites and reduce pressure on the sites. However, the location and habitat type of such alternative destinations must be carefully selected to be effective.

Breeding Birds (April to September)

4.12 In addition to their populations of overwintering birds, the Broadland SPA / Ramsar is also internationally important for breeding bird species, including bittern and marsh harrier. These species are also sensitive to recreational pressure, particularly from dog walkers.

4.13 Disturbance to birds during the pre-incubation, incubation and chick provisioning stages may lead to the abandonment of potential nesting sites, eggs or chicks, resulting in failure to reproduce or in reduced calorific intake by chicks. If disturbance is strong enough, the failure to produce viable offspring may result in reduced fitness at the population level. Disturbance from dog walkers is a particular threat to ground-nesting birds, which tend to have lower disturbance tolerances because their nests are at higher risk from predators.

Trampling Damage, Nutrient Enrichment and Wildfires

4.14 Most terrestrial habitats (especially dune systems, heathland and woodland) can be affected by trampling and other mechanical damage, which in turn dislodges individual plants, leads to soil compaction and erosion. The following studies have assessed the impact of trampling associated with different recreational activities in different habitats:

- Wilson & Seney)[36] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.

- Cole et al[37] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each trampled between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some

[36] Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off-road bicycles on mountain trails in Montana. *Mountain Research and Development* **14**:77-88

[37] Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* **32**: 203-214
Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* **32**: 215-224

recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole [38] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampling weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in the effect on cover.

- Cole & Spildie[39] experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse trampling was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Generally, it was shown that higher trampling intensities caused more disturbance.

- In heathland sites, trampling damage can affect the value of a site to wildlife. For example, heavy use of sandy tracks loosens and continuously disturbs sand particles, reducing the habitat's suitability for invertebrates[40]. Species that burrow into flat surfaces such as the centres of paths, are likely to be particularly vulnerable, as the loose sediment can no longer maintain their burrow. In some instances, nature conservation bodies and local authorities resort to hardening paths to prevent further erosion. However, this is concomitant with the loss of habitat used by wildlife, such as sand lizards and burrowing invertebrates.

4.15 A major concern for nutrient-poor terrestrial habitats (e.g. heathlands, sand dunes, bogs and fens) is nutrient enrichment associated through dog fouling, which has been addressed in various reviews (e.g.[41]). It is estimated that dogs will defecate within 10 minutes of starting a walk and therefore most nutrient enrichment arising from dog faeces will occur within 400m of a site entrance. In contrast, dogs will urinate at frequent intervals during a walk, resulting in a more spread out distribution of urine. For example, in Burnham Beeches National Nature Reserve it is estimated that 30,000 litres of urine and 60 tonnes of dog faeces are deposited annually[42]. While there is little information on the chemical constituents of dog faeces, nitrogen is one of the main components[43]. Nutrient levels are the major determinant of plant community composition and the effect of dog defecation in sensitive habitats is comparable to a high-level application of fertiliser, potentially resulting in the shift to plant communities that are more typical of improved grasslands.

Summary

4.16 The available baseline information suggests that the Broadland SPA / Ramsar, The Broads SAC, are both vulnerable to recreational pressure. This is due to a combination of visual and noise

[38] Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.
[39] Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* **53**: 61-71
[40] Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.
[41] Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. 2005. Dogs, access and nature conservation. English Nature Research Report, Peterborough.
[42] Barnard A. 2003. Getting the facts – Dog walking and visitor number surveys at Burnham Beeches and their implications for the management process. *Countryside Recreation* **11**:16-19.
[43] Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

disturbance to overwintering and breeding bird species, trampling damage in sensitive habitats and nutrient enrichment of otherwise nutrient-poor habitats.

4.17 Overall, the following European site within 10km of Bungay Parish are sensitive to recreational pressure as a result of NP development (the sites in bold are taken forward into the following chapters):

- **The Broads SAC (the closest component part lies approx. 4.6km to the east of the Parish boundary)**
- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

Water Quantity, Level and Flow

4.18 The water level, its flow rates and the mixing conditions are important determinants of the condition of European sites and their qualifying features. Hydrological processes are critical in influencing habitat characteristics in wetlands and coastal waters, including current velocity, water depth, dissolved oxygen levels, salinity and water temperature. In turn these parameters determine the short- and long-term viability of plant and animal species, as well as overall ecosystem composition. Changes to the water flow rate within an estuary can be associated with a multitude of further impact pathways, including substratum loss, smothering and changes in wave exposure, and often interact with coastal squeeze.

4.19 A highly cited review paper summarised the ecological effects of reduced flow in rivers. Droughts (ranging in their magnitude from flow reduction to a complete loss of surface water) have both direct and indirect effects on stream communities. For example, a marked direct effect is the loss of water and habitat for aquatic organisms. Indirect effects include a deterioration in water quality, changes to the food resources and alterations in interspecific interactions. An increased stability of baseflow and a reduction in the natural flow variability of rivers has been linked to the excessive growth of macrophytes and a reduction in fish populations in rivers and recipient waterbodies.

4.20 The unique nature of wetlands combines shallow water and conditions that are ideal for the growth of organisms at the basal level of food webs, which feed many species of birds, mammals, fish and amphibians. Overwintering, migrating and breeding wetland bird species are particularly reliant on these food sources, as they need to build up enough nutritional reserves to sustain their long migration routes or feed their hatched chicks.

4.21 Maintaining a steady water supply is of critical importance for many hydrologically dependent SPAs, SACs and Ramsars. For example, in many wetlands winter flooding is essential for sustaining a variety of foraging habitats for SPA / Ramsar wader and waterbird species. However, different species vary in their requirements for specific water levels. Splash and / or shallow flooding is required to provide suitable feeding areas and roosting sites for ducks and waders. In contrast, deeper flooding is essential to provide foraging and loafing habitats for Bewick's swans and whooper swans.

4.22 Wetland habitats rely on hydrological connections with other surface waters, such as rivers, streams and lakes. A constant supply of water is fundamental to maintaining the ecological integrity of sites. However, while the natural fluctuation of water levels within narrow limits is desirable, excess or too little water supply might cause the water level to be outside of the required range of qualifying birds, invertebrate or plant species. This might lead to the loss of the structure and functioning of wetland habitats. There are two mechanisms through which urban development might negatively affect the water level in European Sites:

- The supply of new housing with potable water will require increased abstraction of water from surface water and groundwater bodies. Depending on the level of water stress in the geographic region, this may reduce the water levels in European Sites sharing the same catchment.
- The proliferation of impermeable surfaces in urban areas increases the volume and speed of surface water runoff. As traditional drainage systems often cannot cope with the volume of stormwater, sewer overflows are designed to discharge excess water

directly into watercourses. Often this pluvial flooding results in downstream inundation of watercourses and the potential flooding of wetland habitats.

4.23 Increases to the quantity and rate of water delivery can result in summer flooding and prolonged / deeper winter flooding. This in turn results in the reduction of feeding and roosting sites for birds. For example, in areas where water is too deep, most waders will be unable to reach their food sources close to the ground.

4.24 Bungay Parish lies in proximity to two European Sites that are sensitive to changes in the hydrological regime, most importantly the wetland habitats in the Broads. Specifically, the Site Improvement Plan for the Broadland sites[44] (encompassing The Broads SAC and the Broadland SPA / Ramsar) identifies inappropriate water levels as a key threat to the qualifying features of both sites. It states that it is '*essential that the correct water management infrastructure and operating protocols are in place to deliver the optimum hydrological regime for the features of interest*'.

4.25 The following European sites within 10km of Bungay Parish are sensitive to changes in water quality as a result of NP development (the sites in bold are taken forward into the following chapters):

- **The Broads SAC (the closest component part lies approx. 4.6km to the east of the Parish boundary)**
- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

Water Quality

4.26 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 the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing bioavailable nitrogen.
- 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.

4.27 Another concern with the BNDP is the discharge of nutrients in treated sewage effluent into the freshwater environment and habitats within and surrounding the Parish, the main pollutant of concern for freshwater ecosystems being phosphorus. The habitats in The Broads SAC have low nutrient concentrations and an increase in the nutrient loading is likely to significantly alter the habitats' plant communities.

4.28 The following European sites within 10km of Bungay are sensitive to changes in water quality as a result of NP development (the sites in bold are taken forward into the following chapters):

- **The Broads SAC (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

[44] Available at: http://publications.naturalengland.org.uk/publication/5444118129934336 [Accessed on the 15/09/2020]

- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

Loss of Functionally Linked Habitat

4.29 While most European sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not necessarily the case. A diverse array of qualifying species including birds, bats and amphibians are not always confined to the boundary of designated sites.

4.30 For example, the highly mobile nature of both wader and waterfowl species implies that areas of habitat of crucial importance to the maintenance of their populations lie outside the physical limits of European sites. Despite not being designated, these habitats are integral to the maintenance of the structure and function of the designated site, for example by encompassing important foraging grounds. Therefore, land use plans that may affect such functionally linked habitat require further assessment.

4.31 There is now an abundance of authoritative examples of HRA cases on plans affecting bird populations, where Natural England recognised the potential importance of functionally linked land[45]. For example, bird surveys in relation to a previous HRA established that approximately 25% of the golden plover population in the Somerset Levels and Moors SPA were potentially impacted by development on or adjacent to functionally linked land, and this required the inclusion of mitigation measures in the relevant plan policy wording. Another important case study originates from the Mersey Estuary SPA / Ramsar, where adjacently located functionally linked land had a peak survey count of 108% of the 5 year mean peak population of golden plover. Similar to the above example, this led to considerable amendments in the planning proposal to ensure that the site integrity was not adversely affected.

4.32 Generally, the identification of an area as functionally linked habitat is not always a straightforward process. The importance of non-designated land parcels may not be apparent and thus might require the analysis of existing data sources to be firmly established. In some instances, data may not be available at all, requiring further survey work.

4.33 The Broadland SPA / Ramsar is designated for mobile bird species that are likely to routinely forage beyond the designated site boundary. Guidance on the core foraging ranges of SPA / Ramsar bird species can be found in a note published by Scottish Natural Heritage[46]. For example, Bewick's swans and whooper swans (both qualifying species in the Broadland SPA / Ramsar) are known to forage in agricultural parcels up to 10km and 5km from the designated site boundary respectively. Hen harriers have a core range of 2km with a maximum distance of up to 10km.

4.34 The following European sites within 10km of Bungay Parish are sensitive to the loss of functionally linked habitat as a result of NP development (the sites in bold are taken forward into the following chapters):

- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

Visual and Noise Disturbance in Functionally Linked Habitat (During and Post Construction)

4.35 Development schemes can result in disturbance of qualifying SPA / Ramsar bird species in functionally linked habitat by several mechanisms. Noise and visual disturbance arising from construction activities may result in behavioural changes (e.g. flight from the nest, cessation of foraging) in birds. Furthermore, post-construction disturbance from site usage, road traffic and operational lighting might also arise. Three of the most important factors determining the

[45] Chapman C & Tyldesley D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – A review of authoritative decisions. Natural England Commissioned Reports 207: 73pp.
[46] Scottish Natural Heritage. (June 2016). Assessing Connectivity with Special Protection Areas (SPAs) – Guidance. 4pp.

magnitude of disturbance appear to be species sensitivity, proximity of the disturbance source and timing / duration of the disturbance.

4.36 An increasing amount of research on visual and noise disturbance of waterfowl from construction (and other activities) is now available. Both processes might elicit disturbance responses, and thereby affect the fitness and survival of wildfowl. For example, noise is a complex disturbance parameter requiring the consideration of several features, including the fact that it is not described on a linear scale, its nonadditive effect and the source-receptor distance. A high level of noise disturbance constitutes a sudden noise event of over 60dB or prolonged noise of over 72dB[47]. Responses to high noise levels include major flight or the cessation of feeding, both of which might affect the survival of birds if other stressors are present (e.g. cold weather, food scarcity).

4.37 Generally, research has shown that above noise levels of 84dB waterfowl show a flight response, while at levels below 55dB there is no effect on their behaviour[48]. These two thresholds are therefore considered useful as defining two extremes. The same authors have shown that regular noise levels should be below 70dB at the bird, as birds will habituate to noise levels below this level[49]. Generally, noise is attenuated by 6dB with every doubling of distance from the source. Impact piling, the noisiest construction process of approx. 110 dB at 0.67m from source, will therefore reduce to 67-68dB by 100m away from the source. The loudest construction noise should therefore have fallen to below disturbing levels by 100m, and certainly by 200m, away from the source even without mitigation.

4.38 Visual disturbance is generally considered to have a higher impact than noise disturbance as, in most instances, visual stimuli will elicit a disturbance response at much higher distances than noise[50]. For example, a flight response is triggered in most species when approached to within 150m across a mudflat. Visual disturbance can be exacerbated by workers operating outside with equipment, undertaking sudden movements and using large machinery. Several species are particularly sensitive to visual disturbance, including curlew (taking flight at 275m), redshank (at 250m), shelduck (at 199m) and bar-tailed godwit (at 163m). While it is noted that none of these species are qualifying features of the Broadland SPA / Ramsar, these escape flight distances provide useful context, as a similar range of responses can reasonably be expected for other waterfowl species. Overall, specific regard should be given to assemblage composition when identifying threshold levels for both visual and noise disturbance.

4.39 Disturbance can also result post-construction although substantial changes in traffic flow are generally needed for significant noise disturbance to arise from roads. For example, a 25% increase in road traffic (e.g. through a road scheme) will result in only a 1dB(A) increase at the roadside, with a 100% increase needed to result in a 3dB(A) increase[51] – the lowest increase in noise that is thought to be even perceivable by humans and birds. In contrast, the introduction of operational lighting of schemes into areas that are not currently lit can result in disturbance of animal species within European sites or those that rely on functionally linked habitats.

4.40 The following European site within 10km of Bungay Parish is sensitive to visual and noise disturbance in functionally linked habitat as a result of NP development, both during and post construction (the site in bold is taken forward into the following chapters):

- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

Atmospheric Pollution

4.41 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2) and are summarised in 2. Ammonia can have a directly toxic effect

[47] As defined in the Waterbird Disturbance Mitigation Toolkit. Institute of Estuarine & Coastal Studies (IECS), University of Hull. (2013). 36pp.
[48] Cutts N & Allan J. 1999. Avifaunal Disturbance Assessment. Flood Defence Works: Saltend. Report to Environment Agency).
[49] Cutts, N., Phelps, A. and Burdon, D. (2009) Construction and waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA, Institute of Estuarine and Coastal Studies, University of Hull.
[50] Research undertaken by the Institute of Estuarine & Costal Studies, University of Hull. 2013. Available at: http://bailey.persona-pi.com/Public-Inquiries/M4%20-%20Revised/11.3.67.pdf [Accessed on the 14/09/2020]
[51] Design Manual for Roads and Bridges. November 2011. Volume 11 (Environmental assessment), Section 3 (Environmental Assessment Techniques), Part 7 (Noise and Vibration), Page A1/3

upon vegetation, particularly at close distances to the source such as near road verges[52]. NOx can also be toxic at very high concentrations (far above the annual average critical level). However, in particular, high levels of NOx and NH_3 are likely to increase the total N deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats[53] [54].

Table 2: Main sources and effects of air pollutants on habitats and species[55]

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO_2)	The main sources of SO_2 are electricity generation, and industrial and domestic fuel combustion. However, total SO_2 emissions in the UK have decreased substantially since the 1980's. Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	Wet and dry deposition of SO_2 acidifies soils and freshwater and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.	Gaseous precursors (e.g. SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants. Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of 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. Due to its significantly longer lifetime, NH_4+ may be transferred	The negative effect of NH_4+ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen.

[52] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.
[53] Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006.** Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. Lichenologist 38: 161-176
[54] Dijk, N. **2011.** Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation Global Change Biology 17: 3589-3607
[55] Information summarised from the Air Pollution Information System (http://www.apis.ac.uk/)

Pollutant	Source	Effects on habitats and species
	much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	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. Half of NO_X emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes. Nitrogen oxides have been consistently falling for decades due to a combination of coal fired power station closures, abatement of other combustion point sources and improved vehicle emissions technology. They are expected to continue to fall over the plan period.	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NOx for all vegetation types has been set to 30 ug/m3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification. In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species. 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 involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). 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 both humans and wildlife, and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.

4.42 Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping[56]. Ammonia emissions originate from agricultural practices[57], with some chemical processes also making notable contributions. As such, material increases in SO_2 or NH_3 emissions will not be associated with the emerging BNDP.

[56] http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.
[57] Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. Atmospheric Environment 32: 309-313

4.43 In contrast, NOx emissions are dominated by the output of vehicle exhausts (more than half of all emissions). A 'typical' housing development will contribute by far the largest portion to its overall NOx footprint (92%) through its associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[58]. The emerging BNDP, which will increase the population of Bungay Parish, can therefore be reasonably expected to increase emissions of NOx through an increase in vehicular traffic.

4.44 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 μgm^{-3}; the threshold for sulphur dioxide is 20 μgm^{-3}. In addition, ecological studies have determined 'critical loads'[59] of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH_3).

4.45 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 insignificant (Figure 3 and see reference [60]). This is therefore the distance that has been used throughout this HRA to identify major commuter routes along European Sites, which are likely to be significantly affected by development outlined in the HLP.

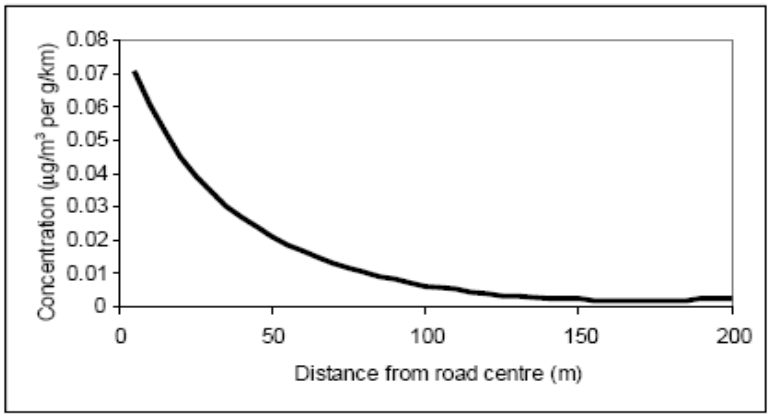

Figure 3: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT[61])

4.46 The following European sites within 10km of Bungay Parish are sensitive to atmospheric pollution arising from NP development such as by increasing the number of two-way vehicle trips through or within 200m of these sites (the sites in bold are taken forward into the following chapters):

- **The Broads SAC (the closest component part lies approx. 4.6km to the east of the Parish boundary)**
- **Broadland SPA / Ramsar (the closest component part lies approx. 4.6km to the east of the Parish boundary)**

[58] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php
[59] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[60] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013; accessed 12/05/2016
[61] http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf; accessed 13/07/2018

5. Screening for Likely Significant Effects

5.1 As an initial step in the analysis, BNDP policies were screened for Likely Significant Effects (LSEs) to identify which policies (and impact pathways) needed to be taken forward to Appropriate Assessment. The screening table for the Neighbourhood Plan policies is provided in Appendix B for reference. The relevant BNDP policies and impact pathways are discussed in further detail below.

Recreational Pressure

The Broads SAC

5.2 The Broads SAC is designated for several aquatic habitat types (e.g. oligo-mesotrophic waters and eutrophic lakes) with associated characteristic plant communities. Furthermore, the SAC supports various Annex II species, including Desmoulin's whorl snail, fen orchid and otter. Both fen orchids and otters are sensitive to recreational disturbance and trampling damage. However, large sections of the SAC are marshy and relatively inaccessible to visitors, and recreational pressure on these species is therefore not considered to be a major concern at this site. Instead, recreational boating and other water-based activities are very popular in the Broads and are the main threat to interest features in The Broad SAC. Boating and anchoring can result in the reworking of sediment, an increase in turbidity and the damage of sensitive plant species. Through the delivery of up to 75 residential dwellings, as well as the development of tourism accommodation, the BNDP will result in the growth of Bungay's population and this may result in an increase in boating activities in the SAC.

5.3 Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)
- Planning Policy CH2: Kings Head re-opening/being brought back into hotel use.
- Planning Policy TC&E2: Proposals for new built permanent tourist and holiday accommodation will be required to be located within the development boundary or on certain listed sites and will be supported.

Broadland SPA / Ramsar

5.4 The Broadland SPA / Ramsar, partly overlapping with The Broads SAC, is designated for its assemblage of overwintering waterfowl and breeding bitterns and marsh harriers. These species are all sustained by the habitats in the SAC and have varying degrees of sensitivity to recreational pressure. As discussed in relation to The Broads SAC, much of the habitat supporting the bird interest (e.g. grazing marsh, reedbeds) is unlikely to be accessible to on-foot visitors. However, water-based activities such as recreational boating might bring visitors in close proximity with foraging or breeding birds, resulting in disturbance. Given that the site supports bird species in the overwintering period as well as the breeding season, recreational pressure is likely to be an issue across the whole year.

5.5 Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)
- Planning Policy CH2: Kings Head re-opening/being brought back into hotel use.

- Planning Policy TC&E2: Proposals for new built permanent tourist and holiday accommodation will be required to be located within the development boundary or on certain listed sites and will be supported.

Water Quantity, Level and Flow

The Broads SAC

5.6 The Broads SAC is designated for habitats and species that are critically dependent on natural flow regimes. A natural flow regime shapes and sustains mosaic biotopes within rivers and their natural floodplains. The SAC relies on all aspects of a natural hydrogeological regime including flushing flow, seasonal baseflow and low flow. Populations of the Desmoulin's whorl snail are dependent on the water level remaining between relatively narrow limits of 0m to 0.6m, with medium snail densities typically recorded at 0.2m. Both the drying up and excessive flooding of snail habitat will reduce the long-term viability of snail populations. The BNDP provides for at least 75 dwellings, which will need to be supplied with potable water. If this increase in demand would lead to the development of further water resources in hydrological continuity with The Broads SAC, this might lead to negative impacts on its qualifying habitats and species.

5.7 Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)

Broadland SPA / Ramsar

5.8 The Broadland SPA / Ramsar is designated for waterfowl and wader species, as well as for birds of prey. All these features are dependent on maintaining a hydrological continuity within the site and with the Rivers Waveney, Yare and Bure, which supply a large proportion of its freshwater. Owing to the SPA's / Ramsar's faunal diversity and habitat complexity, changes in its hydrological regime may have a wide range of consequences. For example, a reduction in the water level of grazing marsh diminishes the habitat available to the invertebrate prey of waders. Flash flooding from impermeable urban surfaces might reduce the breeding success of species that build their nests close to the water level, including bitterns and marsh harriers. Furthermore, a reduction of freshwater input to the marine environment can lead to changes in water salinity and / or turbidity, with potential effects on invertebrate and fish populations. The supply of potable water to at least 75 new dwellings allocated in the BNDP might lead to increased abstraction from surface waterbodies in hydrological continuity with the SPA / Ramsar, potentially leading to cascading effects on the site's qualifying bird interest.

5.9 Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)

Water Quality

The Broads SAC

5.10 Some of the qualifying habitats (e.g. the oligo-mesotrophic waterbodies with *Chara* vegetation and the natural eutrophic lakes) in The Broads SAC are highly sensitive to increases in the nutrient levels, especially phosphate concentrations. Increased phosphorus loadings are likely to lead to higher algal biomass in freshwater bodies. Such algal blooms compete with vascular plants for nutrients and light, change the pH and produce toxins. The most important side effect of eutrophication and algal blooms is a decrease in dissolved oxygen levels, which in turn can negative impacts on invertebrate and fish populations. Desmoulin's whorl snails may also be directly or indirectly affected by organic pollution, particularly when they become immersed during deep flow or when supporting vegetation becomes rank.

5.11 Overall, Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)

Broadland SPA / Ramsar

5.12 The qualifying waterfowl, waders and birds of prey in the Broadland SPA / Ramsar are unlikely to be directly sensitive to an increase in phosphorus loading. Negative water quality effects on the SPA / Ramsar are likely to be primarily mediated via effects on the bottom of the food chain, such as changes in both plant and invertebrate community composition. Natural England's Site Conservation Objectives Supplementary Advice note highlights that poor water quality can affect the availability of suitable breeding, rearing, feeding, roosting and loafing habitats. The importance of good water quality to the integrity of the bittern populations is also mentioned.

5.13 Overall, Likely Significant Effects therefore cannot be excluded and the following BNDP policies are screened in for Appropriate Assessment:

- Planning Policy H4: Land to the east of St Margaret's Road (provides for 75 new dwellings in the BNDP)

Loss of Functionally Linked Habitat

Broadland SPA / Ramsar

5.14 The closest component parcels of the Broadland SPA / Ramsar are Geldeston Meadows SSSI and Stanley and Alder Carrs SSSI lies approx. 4.6km and 7.6km respectively from Bungay Parish. The sites are both mainly designated for various botanical criteria and plant species rather than specifically for mobile bird species, although typical grazing-marsh birds are well represented including breeding snipe, lapwing, reed warbler and reed bunting. In the background to impact pathway section the core foraging distances for some of these species were provided, placing Bungay Parish outside the likely core foraging zone of SPA / Ramsar birds from the SPA / Ramsar components designated for mobile bird species such as Bewick's swans and Whooper swans, with the sole allocation in the Neighbourhood Plan (Policy H4, Land to the East of St Margaret's Road) being 6.2km from the nearest part of the SPA/Ramsar (Geldeston Meadows).

5.15 Therefore, it is concluded that Likely Significant Effects of the emerging BNDP on the Broadland SPA / Ramsar regarding Loss of Functionally Linked Habitat can be excluded. The site is screened out from Appropriate Assessment in relation to this impact pathway.

Visual and Noise Disturbance in Functionally Linked Habitat (During and Post Construction)

Broadland SPA / Ramsar

5.16 The Broadland SPA / Ramsar is designated for mobile waterfowl and bird of prey species, which are likely to use greenfield sites surrounding the SPA / Ramsar (see LSEs screening section on the loss of functionally linked habitat). Visual and noise disturbance arising from construction has the potential to impair the ability of species (particularly Bewick's swans and whooper swans) to forage out with the designated site boundary. This risk is negligible, given that Bungay Parish lies approx. 4.6km from the SPA / Ramsar designated for Bewick's swans and other mobile bird species.

5.17 Therefore, it is concluded that Likely Significant Effects of the emerging BNDP on the Broadland SPA / Ramsar regarding Visual and Noise Disturbance in Functionally Linked Habitat (During and Post Construction) can be excluded. The site is screened out from Appropriate Assessment in relation to this impact pathway.

Atmospheric Pollution

The Broads SAC

5.18 The Broads SAC comprises a habitat mosaic with varying degrees of sensitivity to traffic-derived nitrogen deposition. The transition mires and quaking bogs are most sensitive to nitrogen deposition with a critical nitrogen load of 10-15 kg N/ha/yr, followed by *Molinia* meadows (15-25 kg N/ha/yr), calcareous fens (15-30 kg N/ha/yr) and alkaline fens (15-30 kg N/ha/yr). For the open water habitats phosphorus is generally the growth limiting nutrient controlling eutrophication. The road most likely to be used by new Bungay residents) is the A143, but no sensitive habitats within the SAC lie within 200m of the A143 to the east of Bungay village. Overall, it appears that none of the sensitive habitats will be impacted from commuter traffic associated with the emerging BNDP.

5.19 Therefore, it is concluded that Likely Significant Effects of the BNDP on The Broads SAC regarding atmospheric pollution can be excluded. The site is screened out from Appropriate Assessment in relation to this impact pathway.

Broadland SPA / Ramsar

5.20 Most qualifying species of the Broadland SPA / Ramsar are not considered to be sensitive to atmospheric nitrogen deposition, because their habitat or foraging requirements are not linked to vegetation community structure. However, two breeding species in the SPA / Ramsar (bitterns and marsh harriers) build their nests in fen reedbeds. Excessive nitrogen deposition could lead to more dense growth of tall graminoids, limiting the ability of these species to find suitable nesting sites. APIS identifies a critical nitrogen load of 15-30 kg N/ha/yr for both species.

5.21 The Broadland SPA / Ramsar overlaps with The Broads SAC in many places. Like the SAC it is mostly located well away from major roads, placing it beyond the impact distance for atmospheric pollution. Given that this SPA / Ramsar is a low altitude system, review of information on APIS suggests that the higher end of the critical nitrogen load range of 30 kg N/ha/yr is more applicable (because APIS advises that the lower end of the range should be used for high altitude systems). The current maximum deposition rate in the SPA / Ramsar is 18.1 kg N/ha/yr, which is well below the identified critical load. It is considered that a very large nitrogen dose would be needed to change the reedbed habitat structure sufficiently to become unsuitable for bitterns and marsh harriers. Therefore, overall, it appears that the sensitive supporting habitats used by SPA / Ramsar species are very unlikely to be impacted from commuter traffic associated with the emerging BNDP.

5.22 Therefore, it is concluded that Likely Significant Effects of the BNDP on the Broadland SPA / Ramsar regarding atmospheric pollution can be excluded. The site is screened out from Appropriate Assessment in relation to this impact pathway.

6. Appropriate Assessment

Recreational Pressure

6.1 The screening for LSEs highlighted that Bungay Parish is likely to be in the catchment zone of three European Sites, all of which are sensitive to recreational pressure and have been screened in for Appropriate Assessment. To avoid unnecessary repetition, this section of the report merges the Appropriate Assessment for these sites. The potential effects could arise from housing development (a single site allocation for 75 dwellings, Policy H4) and from policies promoting tourist infrastructure (Policy TC&E2 and Policy CH2).

Background on The Broads SAC, Broadland SPA / Ramsar

6.2 These sites all lie within 10km from Bungay and therefore within reasonably short travel distance to realistically attract new residents from the Parish. Many of these European Sites are sensitive to recreational pressure either due to disturbance, trampling damage or eutrophication. Initially the sensitivity and access patterns to each of the sites are discussed separately, but the in-combination evidence and potential mitigation measures are then discussed for all sites together. This has been done to make the assessment more succinct and avoid unnecessary repetition.

6.3 The Broads SAC, which is contiguous with large parts of the Broadland SPA / Ramsar, is designated for a range of habitats and several species, most of which are sensitive to recreational pressure to varying degrees. For example, its base-rich nutrient water harbours benthic vegetation comprising *Chara* spp. More nutrient-rich eutrophic lakes comprise *Magnopotamion* and *Hydrocharition* vegetation. Recreational activities, especially boating or canoeing, may disturb or physically damage the sensitive vegetation. The anchoring of boats may be particularly disruptive as this leads to abrasion, reworking and erosion of sediment. Qualifying species like otter and fen orchid are also sensitive to disturbance, although the latter depends on a limited amount of disturbance for its long-term survival at a site.

6.4 The Broadland SPA / Ramsar is designated for its non-breeding and breeding bird species, all of which are easily disturbed by recreational activities. This particularly applies to dog walking (as free-roaming dogs represent an additional disturbance factor), but recreational boating is also a very popular activity in the area. The additional risk from boating stems from the fact that it is water-based, potentially bringing visitors in much closer contact with waterfowl. Sensitive bird species are present on site all year, meaning that disturbance is not a seasonal issue and requires appraisal across all seasons. Natural England's Site Improvement Plan (SIP) identifies recreational disturbance of wintering waterfowl as a threat to site integrity.

6.5 The BNDP allocates a maximum of 75 residential dwellings and promotes limited tourism infrastructure (although it makes no allocations for the latter). Therefore, development provided in Bungay could only lead to adverse effects on the integrity of the above sites in-combination with other plans and projects.

6.6 The evidence for recreational pressure across Norfolk's and Suffolk's European Sites largely stems from visitor surveys undertaken by Footprint Ecology in 2016 and 2017. Overall, 40 survey points were surveyed, of which 7 locations are relevant to the BNDP (7 survey points in the Broads covering the Broadland SPA / Ramsar and The Broads SAC). The survey consisted of two main components: A tally count comprising the total number of adults, minors and dogs to develop a sense of the busyness and visitor questionnaires to determine the recreational activities undertaken and the distance that people travel to the sites.

6.7 Tally data from survey points in the Broads (those covering the Broadland SPA / Ramsar and The Broads SAC) show that these have approx. 20 visitors per hour. However, not all survey points are equally likely to be visited by residents from Bungay. While not as busy as some of the other areas surveyed, the Broads are therefore still popular recreation destinations. At Upton Green,

dogs made up a relatively high proportion of the total tally count (>25%), indicating this might be a focal point for future dog walkers from Bungay.

6.8 Survey points on the coast, especially Horsey Gap, Horsey Windpump and Winterton, were very busy with approx. 600 people and dogs over 16 hours. At Horsey Gap the number of visitors (people and dogs) reached 2,000 over two survey days. It is noted that Horsey Gap is particularly popular among visitors in the winter seal pupping season, when breeding little terns are absent from the site. Notwithstanding this, coastal sites are attractive in all seasons and significant recreational pressure can also be expected in summer. At three locations dogs made up a large proportion of the tally count, including North Denes, Breydon Water South and Breydon Water North. Notably, at Breydon Water South, dogs constituted over 50% of the overall tally count. This might indicate that this site is particularly popular among dog walkers.

6.9 In the questionnaires, visitors were asked what their main activity was, and interviewee responses revealed an interesting difference between the Broads and the East Coast. Of the 181 visitors interviewed in the Broads, 39 (21.5%) responded they were undertaking a boating activity. Boating is typically a niche activity that is carried out by few people, however in the Broads this is clearly a form of recreational pastime that warrants further consideration. In contrast, interview data for the East Coast showed more 'typical' activity patterns with high proportions of dog walkers (over 75% of interviewees) at Winterton, North Denes and Breydon Water South. These results illustrate that the focus of mitigation measures between these two geographic areas should perhaps differ (see discussion further down).

6.10 Differences between the Broads and the East Coast were also evident when interviewees were asked about the duration and frequency of their visits. Over 75% of interviewees visiting the Broads remain on site for over 1 hour, whereas this is only approx. 55% for interviewees on the East Coast. The Broads also had a much larger proportion of visitors staying for over 4 hours (30%) than the East Coast (approx. 5%). Inversely, the East Coast is revisited much more frequently (51% of interviewees visit at least once a week) than the Broads (only 32% of interviewees are frequent visitors). This might imply that survey locations on the Norfolk coast have a more local core recreational catchment zone than the Broads. This is supported by the main reason given for visiting each of the areas, with interviewees more frequently citing 'close to home' in the East Coast (26.9%) than in the Broads (19.6%).

6.11 Asked about their awareness of conservation designations that apply to the visited site, only 31% of interviewees responded with 'yes' on the East Coast. A higher proportion of visitors was aware of nature conservation designations in the Broads (43%). However, the results for both areas highlight that there is substantial room for improvement regarding visitor awareness, education and engagement.

6.12 Overall, 98% of interviewees (1,312 responses) provided a valid home postcode, enabling an accurate picture of the catchment zones of European Sites to be drawn. People visiting directly from home (i.e. those not on holiday) travelled a median distance of approx. 15km to the Broads. Using the postcode data, Footprint Ecology also created distance decay curves, illustrating how the draw of surveyed areas declines with distance from survey point. The curves show that the Broads attract the highest proportion of visitors from the first 5km distance bands.

6.13 Using scientific data, this section clearly identifies recreational pressure as an existing issue for a wide range of European Sites in the wider area surrounding Bungay Parish. The high pressure on recreational resources clearly highlights that mitigation interventions are mandatory to avoid adverse effects on the integrity of nature conservation sites. Such a mitigation framework is already in place and is discussed in more detail in the following section.

Waveney Local Plans and Accompanying HRAs

6.14 The long-standing issue of recreational pressure on Norfolk's European Sites has meant that this process has been addressed in HRAs of previous planning documents. Being a lower-tier planning document, the BNDP falls under the remit of policy produced by the overarching Waveney Local Planning Authority (LPA). Furthermore, sections of the Broadland SPA / Ramsar and The Broads SAC also fall within the remit of the Broads Authority. This is particularly important as the management of recreational pressure can rarely be practically undertaken by

Parish Councils. Therefore, consideration of policy wording in the Waveney Local Plan and the Broads Local Plan, and any mitigation measures recommended in accompanying HRAs is an integral step in placing the BNDP into context.

6.15 The Waveney Local Plan had allocated 485 new houses to be developed within the Bungay parish, this would be in addition to the 75 being developed through the BNDP. As the Waveney Local Plan was designating these houses plus addition housing developments in other area the plan had to be assessed using a HRA. The HRA of the Waveney Local Plan Core Strategy assessed the potential for recreational impacts on the Broadlands SPA / Ramsar and The Broads SAC, as well as other European protected sites as part of its post-examination changes. In earlier iterations of the HRA recreational impacts on these sites had been dismissed. The HRA of that Local Plan considers that due to the evidence gap there was significant uncertainty regarding recreational impacts. Much of the Broads comprise wetland areas and grazing marsh with limited access. Furthermore, the breeding bird interest is in reedbeds, which also have limited accessibility. Notwithstanding this, the 2017 visitor survey report highlighted that boating is an exceptionally popular activity in this area, with a higher potential to affect both breeding and non-breeding bird species. It now seems warranted that recreational pressure impacts in relation to these sites require mitigation.

The Broads Plan

6.16 Some European Sites that are sensitive to recreational pressure (i.e. The Broads SAC, Broadland SPA / Ramsar, Breydon Water SPA / Ramsar, Winterton-Horsey Dunes SAC) lie wholly or partly within the Broads Executive Area, which has the status equivalent to a National Park. The Broads forms a Local Planning Authority in its own right, which has published the Broads Local Plan (a planning document that guides development in the authority) and the Broads Plan. The latter is the single most important strategy document for the Broads, providing for a wide range of partnership plans, programmes and policies in the period between 2017 and 2022.

6.17 One of the strategic aims of the Broads Plan is to provide distinctive recreational experiences without compromising the integrity of its natural environment. One of its strategic actions is to '*develop and implement schemes to upgrade and improve the network of access points and routes (where adverse effects can be prevented)*'. For example, it proposes that County Cycling and Walking Action Plans are implemented (including a new priority cycle route) to increase the wider accessibility in the Broads. It is noted that while increasing accessibility may increase visitor footfall in the site, this is also likely to promote focal areas for recreational activities that discourage the diffuse distribution of visitor pressure across the site. Furthermore, by setting out that the wildlife value of the Broads must not be compromised, the Broads Plan provides an existing reference point in which recreational pressure is managed.

Appropriate Assessment

6.18 Information in the preceding paragraphs has set the scene regarding the European Sites potentially impacted by population growth stemming from the BNDP. It sets out the range of qualifying habitats and species under threat from increased demand for recreational space and the fact that visitor survey work identifies a 15km catchment for The Broads with a 5km core zone. However, recreational pressure is only an issue when the European site parcels are open to the public. Neither Geldeston Meadows nor Stanley & Alder Carrs at Aldeby are open to the public. The nearest publicly accessible part of The Broads SAC/Broadland SPA/Ramsar is Sprat's Water & Marshes at Carlton Colville. This is 15km from Bungay Parish (and thus any new tourism accommodation) and 16.5km from the only housing site allocation. It is unlikely Bungay residents, or tourists staying in Bungay in any new accommodation, would regularly travel such a large distance for recreation when many other areas of publicly accessible land and water are closer. The policies in the Neighbourhood Plan regarding tourism infrastructure make it clear that the primary purpose of such infrastructure would be to encourage tourism within and around Bungay.

6.19 Therefore, it is concluded no adverse effect on integrity would arise on The Broads SAC or Broadland SPA/Ramsar site.

Water Quantity, Level and Flow

The Broads SAC and the Broadland SPA / Ramsar

6.20 The qualifying features of both the Broadland SPA / Ramsar and The Broads SAC are critically dependent on a naturally fluctuating hydrological regime. Most bird species of the SPA / Ramsar depend on specific water depths to ensure their foraging success throughout the year. For example, bittern rely on visual detection of prey, which may be compromised in deeper water. In contrast, deeper water surrounding nesting sites might be important for deterring predators. Whooper and Bewick's swans depend on sufficient water depth for feeding and / or roosting. Natural England's Site Conservation Objectives Supplementary Advice Note specifies that a water depth of <1m should be maintained over 50% of the site. Within swamp and marginal water, the depth should be between 0.3-1m, while within pools and dykes a depth of 2-4m should be maintained.

6.21 Useful context regarding the importance of maintaining appropriate water levels in these two European Sites is provided in the Broads Plan. More than half the rivers in the Broads have been physically modified and the abstraction of water for domestic or agricultural use has risen in the past decades and will continue to do so in light of further urban growth surrounding the Broads. In recognition of this problem, the Broadland Catchment Partnership was formed in 2012 to better manage the area's water resources. The Broads Plan outlines that sustainable water abstraction policies are in place, as detailed in the Broadland Catchment Abstraction Management Strategy. Water efficiency measures (e.g. water consumption standards, increasing domestic water metering and incentive schemes) are also being delivered across the Broads. This evidence clearly illustrates the importance of recognising this impact pathway in the emerging BNDP.

6.22 Generally, the supply of potable water to households and industry needs to be set into context of the overall water resources available in a region. The Environment Agency (EA) have identified East Anglia as one of the driest regions in the UK, with an average annual rainfall of 600mm compared to the national average of 900mm. Not all rainfall is available to replenish waterbodies, as some is lost as evapo-transpiration from vegetation. The EA also publishes a monthly water situation report, which reveals that East Anglia had notably low rainfall, river flows and groundwater levels, and high soil moisture deficit in July 2020[62]. Furthermore, the EA's classification of water-stressed areas highlights that the area covered by Essex & Suffolk Water is currently under serious water stress[63] and this is projected to be the case under all four future development scenarios.

6.23 The water supply in Bungay Parish and the wider east of England area is provided by Essex & Suffolk Water (ESW). ESW published its Final Water Resources Management Plan (WRMP) 2019[64], which covers a 40-year planning period from 2020 to 2060 and thus encompasses the Neighbourhood Plan period. Bungay falls within the Suffolk Northern Central Water Resource Zone (WRZ).

6.24 Licenses for abstractions from surface water and groundwater bodies are granted by the EA and the Review of Consents process takes Conservation Objectives of European Sites into account. In other words, the EA will not permit abstraction volumes that would threaten the integrity of nature conservation sites. As such, remaining within the consented abstraction license will by default not result in adverse effects on The Broads SAC and the Broadland SPA / Ramsar.

6.25 In order to establish future levels of supply and demand, water companies account for a variety of factors, including:

- Population growth (the WRMP projects that the regional population will grow by 19.7% over the next 25 years compared with 2016-17)

[62] It is to be noted that parameters are compared to the average for specific areas, and not to a national average.
[63] Serious water stress is identified as an area where the household demand for potable water makes up a high proportion of the effective rainfall available to meet that demand.
[64] Essex & Suffolk Water. (August 2019). Final Water Resources Management Plan 2019. Available at: https://www.nwg.co.uk/responsibility/environment/wrmp/current-wrmp-2015-2020/ [Accessed on the 09/09/2020]

- Impacts of climate change
- Operational water losses and losses at Wastewater Treatment Works
- Losses due to issues with water quality and system leakage

6.26 The growth allocated in the BNDP is not explicitly referenced or modelled within Essex & Suffolk Water's WRMP. However, future water demand is based on a robust forecast of expected future population growth in all WRZs, taking account of other variables such as climate change and pipe leakages. By definition a robust population growth estimate would include housing growth allocated in development plans, such as the BNDP.

6.27 Given that the increased demand in Bungay Parish can be met by supply options which do not require an increase in the abstraction of water (from either groundwater or surface water sources), it is concluded that the emerging BNDP will not result in adverse effects on the Broadland SPA / Ramsar and The Broads SAC regarding water quantity, level and flow.

Water Quality

The Broads SAC and the Broadland SPA / Ramsar

6.28 As established in the background to impact pathways section and screening for LSEs, the Broadland SPA / Ramsar and The Broads SAC are both sensitive to a decline in water quality. A potential negative impact of treated sewage effluent on these sites was screened out from Appropriate Assessment, because the Bungay Sewage Treatment Works (BSTW) that processes sewage from Bungay Parish discharges out into the Tin river via an outfall pipe. The Tin river flows our into Waveney river which goes through sections of Broadlands SPA / Ramsar and The Broads SAC. Therefore, there may be a hydrological linkage between the BSTW and the Broadland SPA / Ramsar or The Broads SAC.

6.29 As the river Waveney flows through Bungay there is a risk for nutrient-enriched or polluted water from overflowing septic tanks to reduce the water quality in these sites. This may be particularly impactful in relation to the oligo-mesotrophic (low nutrient concentrations) and natural eutrophic (higher nutrient concentrations) waterbodies and associated vegetation. Nutrient over-enrichment may lead to hypertrophic conditions, a decline in species richness, algal blooms and reduced oxygen concentrations. Specific recognition to the importance of maintaining good water quality status in the Broads is given in the Broads Plan, which identifies diffuse phosphorus and nitrogen pollution from domestic wastewater and farmland as a continuing issue for the site.

6.30 The Broad SAC and the Broadland SPA / Ramsar are excluded from the Waveney Local Plan because they are situated in the Broads, an area established as of national value for its rich wetlands under the Norfolk and Suffolk Broads Act 1988. The area encompassed by the Broads is managed by the Broads Authority, which deals with water management issues arising from development in its authority boundary. Notwithstanding this, there needs to be recognition of water quality issues in plans that cover development sites in proximity to and hydrological connectivity with the Broads.

6.31 Overall, given the distance away from the BNDP and the development of the new houses away from the Waveney river it is concluded that the DNDP will not lead to adverse effects on the integrity of these sites regarding the water quality impact pathway.

7. Conclusions and Recommendations

7.1 This HRA investigated the policies and site allocations (proposing up to 75 residential dwellings to be delivered) included in the emerging BNDP and assessed whether any part of the BNDP could result in LSEs and, where applicable, adverse effects on the integrity of the following European sites:

- The Broads SAC
- Broadland SPA / Ramsar

7.2 Notably, the impact pathway atmospheric pollution was screened out from Appropriate Assessment because it was determined that the BNDP would not lead to an increase in commuter traffic within 200m of sensitive habitats in any of the European sites. Furthermore, it was concluded that supplying new developments with potable water would not result in adverse effects on the integrity of The Broads SAC or the Broadland SPA / Ramsar. This was primarily because Suffolk & Essex Water (the company responsible for potable water supply in Bungay Parish) will be able to meet the increased water demand without increasing water abstraction rates or having to develop new water resources. The impact pathway recreational pressure was screened in during the likely significant section due to three policies being Planning Policy H4, Planning Policy CH2, and Planning Policy TC&E2. However, in the Appropriate Assessment it was determined that the BNDP would not lead to a significant increase in impacts from increased recreational pressure within any of the European sites as the single site allocation in the NDP, and any potential tourism accommodation, lie over 15km from the closest publicly accessible part of the SAC or SPA/Ramsar.

Appendix A

Figure 4. Map of proposed housing development allocated in the emerging BNDP.

Appendix B

Figure 4: Map of European Sites within 10km from Bungay and development sites allocated in the emerging BNDP.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Bungay Neighbourhood Plan Area
- Neighbourhood Plan Area 10km Buffer
- Housing Allocation
- Ramsar
- Site of Special Scientific Interest (SSSI) (within 10km)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

Purpose of Issue
DRAFT

Client
BUNGAY NEIGHBOURHOOD DEVELOPMENT GROUP

Project Title
BUNGAY HRA

Drawing Title
BUNGAY NEIGHBOURHOOD PLAN IN RELATION TO EUROPEAN AND NATIONAL SITES

Drawn	Checked	Approved	Date
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AECOM
Scott House
Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

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Appendix C

Table 3: Likely Significant Effects (LSEs) screening table of the Bungay Neighbourhood Plan policies.

Policy Number / Name	Text	Test of Likely Significant Effect
Planning Policy H1. Design Principles for New Development	All new residential development will be designed to a high quality, considering local character and enhancing local distinctiveness, creating good quality developments, thriving communities and prosperous places to live. The following design principles will be applied to all new development within the neighbourhood plan area: a. New development should not have, or have the appearance of having, an excessive density, taking into account its context and setting, but should nevertheless be an efficient use of land. b. There must be sufficient private outdoor amenity space, unless in exceptional circumstances it can be shown that it is not necessary in light of the proximity of off-site public open space. c. Provide ample internal space. Proposals that are significantly above the minimum nationally described space standards will be positively supported. d. There will be a permeable, especially for pedestrians and cyclists, and interconnected street network, providing people with a choice of different routes and allowing traffic to be distributed evenly across the network. Places will be legible and well signposted, ensuring they function well and support navigation. f. Development will create blocks (but not perimeter blocks) that are defined by streets, green spaces and pedestrian and cycle routes, providing clarity between the fronts and backs of buildings, public and private spaces and enabling continuous overlooking of the street. g. The edges of development will create a positive interface and reflect the character of its surroundings. h. Development will create coherent enclosure with buildings and/or large trees defining and enclosing spaces that lie between them.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the design principles for all new developments within the neighbourhood plan area. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.

	i. Buildings on corners should be designed to emphasize the importance of their corner position. j. Continuous building lines and setbacks will be used to support creation of enclosure and definition of the public realm. k. Streets will have active frontages to create well-used and attractive streetscapes. l. Proposals must allow for attractive views through and from the development, especially out into the surrounding countryside, to be retained and not obscured, and these views should be identified as part of any application. Landmarks, vistas and focal points will be used to create places that are easy to read and allow users to easily orientate themselves; and m. Building materials and architectural design features will complement those of the local distinctive character of Bungay, although innovative contemporary design will be encouraged. n. Applications will need to explain how the design has maximised the potential to achieve net zero carbon emissions. These principles will apply equally to open market and affordable housing with the expectation that the two are indistinguishable in terms of general appearance. Development will be expected to meet these criteria unless evidence is presented showing that by doing so it would fail to preserve, complement or enhance the character of the immediate area and the historic context of Bungay.	
Planning Policy H2: Housing mix	New housing developments should provide a mix of housing to meet the needs of the community. Housing developments, including the conversion of existing buildings to dwellings, shall meet the following criteria unless evidence is presented to show this is contrary to local need: a. For all new housing applications, the inclusion of dwellings with more than three bedrooms will be an exception that will need to be justified by clear evidence that this is meeting a local need or is necessary for viability; and b. For all major applications of 10 or more dwellings, at least 40% of dwellings must be suitable or easily adaptable for occupation by the elderly, infirm or disabled, in line with Local Plan policy WLP8.31.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the housing mix to be provided in Bungay, such as if an application has 10 or more dwellings then 40% of dwellings will need to be accessible to the elderly and disabled. It also stipulates that at least 10% of plots on residential proposals of 20 dwellings or more should provide serviced self/custom-build plots unless certain conditions are met.

	Proposals for sheltered or extra-care housing will be supported and can be included as affordable housing units where appropriate. The inclusion in a housing proposal of eco-homes to Passivhaus or other high energy efficiency standards will be encouraged. At least 10% of plots on residential proposals of 20 dwellings or more should provide serviced self/custom-build plots unless: c. a lack of local need for such plots can be demonstrated; or d. plots have been marketed for 12 months and have not been sold. Build-to-rent proposals will also be supported.	There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy H3: Affordable housing	The inclusion of affordable housing provision as part of proposals for fewer than 10 dwellings within the settlement boundary will be strongly supported. The tenure of affordable housing provision should reflect the prevailing local housing need. An affordable housing mix that provides opportunities for people to buy, including discounted homes to buy, as well as affordable rent will be supported. Entry-level exception-site proposals which are outside of the settlement boundary will be permitted where: a. The proposal would help to meet a local housing need; b. It is situated within 50m of the settlement boundary; and c. The proposal will enable future occupants to access local services and facilities using sustainable means of transport such as walking.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the inclusion of affordable housing. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy H4: Land to the east of St Margaret's Road	Land east of St Margaret's Road, Bungay (4.5 hectares) is allocated for the development of approximately 75 dwellings, open space, landscaping and ecological enhancement. The site should be developed in accordance with the following site-specific criteria: a. A detailed masterplan, informed by ongoing engagement with the community, and part of an overall masterplan that includes allocated site WLP 5.2 of the Local Plan, should be prepared and submitted as part of any full or outline planning application. b. The site will be developed at a density of approximately 20-25 dwellings per hectare.	Likely Significant Effects on European Sites cannot be excluded. This text identifies that the Bungay Neighbourhood Plan will provide for 75 dwellings following a list of criteria, such as dwellings should be three bedrooms or fewer with exceptions if fully justified.

	At least 10% of plots will be set aside for those wishing to build their own home unless a lower local demand can be shown. d. Dwellings of three bedrooms or fewer. Exceptions to this will need to be fully justified. e. Vehicular access should be from St Johns Hill, via the site allocated in the Local Plan as Policy WLP5.2. f. One hectare of open space should be provided on site for informal recreation and ecological enhancement. g. Natural features on the site such as trees and hedgerows should be retained where possible and incorporated into the layout of the development. h. A landscape belt should be provided along the southern edge of the site. i. Pedestrian and cycle routes should be provided that link with the allocated site to the east (WLP 5.2 of the Local Plan), and the Green Corridor going north (see Policy ENV1 and Figure 7). A cycle route should also be provided onto St Margaret's Road with safety features introduced on the road if necessary. j. Any planning application is to be supported by the results of a programme of archaeological evaluation, including appropriate fieldwork if necessary, and should demonstrate the impacts of development on archaeological remains and proposals for managing those impacts. k. A Landscape and Ecological Management Plan will be required as part of any planning application. This will need to demonstrate a significant net gain in ecological value. It will also need to demonstrate how the development is integrated into the wider landscape through the design of the buildings, the layout, and use of landscaping/ vegetation. The strategy will need to identify and preserve any important key views. l. Any planning application is to be accompanied by a drainage strategy incorporating sustainable drainage principles. m. An assessment of the impact on heritage assets will be required as part of any planning application in view of the proximity of the listed Manor Farmhouse. n. The layout and design will need to promote self-enforcing traffic speeds that do not exceed 20mph on the site. o. Any planning application should be supported by evidence which assesses the quantity and quality of sand and gravel resources within the site in order to determine whether it is practical to make use of resources on site, in accordance with the Suffolk Minerals and Waste Local Plan.	The policy also states that development outside the development limits will only be allowed subject to specific policies in the Neighbourhood Plan and / or overarching Local Plan. The following impact pathways are associated with an increase in the local population: • Recreational pressure • Water quantity, level and flow • Water quality • Visual and noise disturbance in functionally linked habitat (during and post-construction) • Atmospheric pollution Due to these linking impact pathways, Policy H4 is screened in for Appropriate Assessment.

Planning Policy CM1: Community Hub	Should some physical space become available to accommodate a Community Hub, its use as a community hub will be supported provided the following criteria are met: a. The site enjoys good access by walking, cycling and public transport for all members of the community. b. The site does not result in the loss of green space and offers opportunities for community gardening. c. The proposal provides for a number of community uses, including leisure and sporting activities. d. The land was previously developed, or brownfield. e. The site has sufficient parking space so that there is no adverse pressure on neighbouring residents; and f. The development includes environmentally friendly facilities, especially electric vehicle plug-in points.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the criteria needed to support the development of a community hub. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy CM2: Bungay Medical Centre	To support planned growth in the town and the needs of the ageing population, proposals for expansion of Bungay Medical Centre will be supported in principle. Proposals will need to demonstrate that sufficient parking is, or can be made, available to meet increased demand or in a way that does not impede the free flow of traffic on neighbouring streets. Good access by sustainable transport modes will be required.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the support for the expansion of Bungay Medical Centre. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy CM3: Sports Facilities	Proposals for increased or expanded sports provision will be supported, provided they are, or can be made to be, reasonably accessible to all members of the community. Positive planning that enables existing facilities to be made accessible for wider community use will be particularly supported.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the support for the expansion of sport facilities. There are no impact pathways that link this policy to European Sites. Therefore, the

		policy is screened out from Appropriate Assessment.
Planning Policy CM4: Pre-school Education	Proposals for a purpose-built provision to enable pre-school education will be supported. This will need to have: • Good access by walking, cycling and public transport; and • Sufficient parking provision, including temporary parking at drop-off and collection times.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the criteria for proposed developments that will enable pre-school education. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy CM5: Community Education	Proposals that will increase the provision of educational opportunities within the town, and support life-long learning and skills development to increase employability will be supported.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the support for proposals that will increase the provision of educational opportunities. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy CH1. Conservation Area	the Bungay Conservation Area or which are outside of it but which may impact on the setting or significance of the Bungay Conservation Area, will be supported where all the following criteria are met: a. The development preserves or enhances the special character and appearance of the area; b. The development is in sympathy with, and integrates into, the characteristic built form of the area;	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the criteria developments will have to meet in order to be developed within

	c. The scale, form, materials and architectural detailing of the development respects the characteristics of adjoining or nearby buildings; d. Important views within, into and out of the area, including into the surrounding countryside, are respected; e. Trees and other landscape features contributing to the character and appearance of the area are preserved; and f. The development in other ways conforms with the character as set out in Conservation Area Character Appraisal. Development proposals will be assessed against these criteria in the context of the particular character area, as set out in the Waveney District Council Bungay conservation Area Character Appraisal, in which the proposal sits, as well as any impact on the conservation Area as a whole. Where possible, consideration will be given to the cumulative impacts of separate development proposals on the character. Proposals that help restore the character, setting or significance of the area will be supported. Similarly, proposals that will bring buildings back into use or which will ensure their long-term use will also be considered favourably, even if this requires a change of use, particularly if the proposal is likely to make a positive contribution to the vitality of the town centre.	or within impact range of the Bungay Conservation Area. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy CH2. The King's Head	Proposals that will result in the Kings Head re-opening/being brought back into hotel use will be encouraged and supported. Proposals that will result in the change of use of the King's Head from a hotel will be supported, provided that it guarantees the long-term use of the building and there are demonstrable and overriding community benefits.	Likely Significant Effects on European Sites cannot be excluded. This development management policy establishes the support for proposals that will result in the Kings Head being re-opened. The following impact pathways are associated with an increase in tourism: • Recreational pressure

		Due to these linking impact pathways, Policy CH2 is screened in for Appropriate Assessment.
Planning Policy CH3. Heritage Statements	A Heritage Statement should be provided in support of all development proposals affecting any designated or non-designated heritage asset or its setting, as well as for all proposals which may affect the significance of such heritage assets. Such statements should be proportionate and outline the significance of any heritage assets affected and any adverse impacts that the development may have on those heritage assets. It should also include any proposed mitigation measures, as well as how the proposed development will contribute positively to the character and setting of the relevant heritage asset.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that a heritage statement should be provided in support of all development proposals affecting any designated or non-designated heritage asset. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning policy TC&E1: Town centre vitality	In order to maintain a thriving and vibrant town centre in Bungay, development proposals within the primary shopping frontage as defined in the Local plan that will lead to a change of use from an A1 (retail) or A3 (cafes and restaurants) of ground floor units will be supported provided that: a. The proposed use will demonstrably support the objective of maintaining or enhancing the vibrancy and vitality of the town centre, attracting people to the town centre; b. The proposal does not create a concentration of non-A1 or A3 uses that would harm the attractiveness of the town centre; c. The proposal does not involve ground floor C3 residential development; d. The change of use is considered necessary to secure the long-term use of a heritage asset and its preservation; and e. The proposed new use is not for planning use class A5 (hot food takeaway). Within the Secondary Shopping Frontage as defined in the Local plan, proposals to change the use of ground floor premises from use classes A1, A2, A3, A4, A5, D2 and sui generis leisure uses to other uses will only be permitted where:	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the criteria needed for development within the town centre to be supported. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.

	f. The proposal would support the vitality and viability of the town centre, and the proposal would not result in a concentration of non-town centre uses in the immediate street frontage; or g. The proposal will contribute to the network of community facilities consistent with Policy CM1; or h. The proposed new use is not for planning use class A5 (hot food takeaway).	
Planning Policy TC&E2: Tourism accommodation	Proposals for new built permanent tourist and holiday accommodation will be required, unless specific overriding justification is provided, to be located within the development boundary or on sites that are: 1. Adjacent to the development boundary; 2. South of the A143; and 3. Of a scale appropriate to Bungay. Proposals within, or adjacent to, the defined town centre will be supported.	Likely Significant Effects on European Sites cannot be excluded. This development management policy establishes that proposals for new built permanent tourist and holiday accommodation will be required to be located within the development boundary or on certain listed sites. The following impact pathways are associated with an increase in tourism: • Recreational pressure Due to these linking impact pathways, Policy TC&E2 is screened in for Appropriate Assessment.
Planning Policy TC&E3: Employment Growth and HGV traffic	Proposals for facilities on existing or allocated employment sites that enable goods to be transferred from HGVs to smaller commercial vehicles will be supported.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that proposals for facilities on existing or allocated employment sites that enable goods to be transferred from HGVs to smaller commercial vehicles will be supported.

		There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy ENV1: Green Corridors	We will seek to create Bungay's first green corridor (see Figure 7) linking the south-east of town to the centre of town, which would incorporate many underutilised or currently inaccessible areas of green spaces throughout the town, to create a single walking / cycleway that would act as a traffic-free route open to all residents. The green corridor would link the new development sites of WLP5.2 and 209 to the centre of the town. The green corridor would link the new development sites of WLP5.2 and 209 to the centre of the town. This would link: • New development sites WLP5.2 and H4 • Prince's Road play area • Wooded area to west of cemetery • Site of the former Old Grammar School play space • Skinners Meadow • Grazing fields leading to Garden Close play space and old allotment site New developments, where relevant, will help to contribute towards or directly deliver the Green Corridor. All new major developments should incorporate biodiversity corridors, greenways and green routes into plans to ensure that existing green spaces and wildlife habitats do not become fragmented and that new residents can have traffic-free access to local services.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the creation of a green corridor and the criteria for new developments to contribute towards the green corridor. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy ENV2: Open Space	New residential development providing open space will need to ensure the open space is designed to deliver a significant gain in ecological value and habitat.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that new residential development providing open space will need to ensure the open space is designed to deliver a significant gain in ecological value and habitat. There are no impact pathways that link this policy to European Sites. Therefore, the

		policy is screened out from Appropriate Assessment.
Planning Policy ENV3: Landscape and Ecological Character	New development will only be permitted where it does not have the potential to have an unacceptable impact on the landscape character or areas of biological and geological significance, with particular regard to the following sites: a. Outney Common b. Stow Fen c. The Waveney Marshes d. Skinners Meadow e. Ollands Plantation	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that new development will only be permitted where it does not have the potential to have an unacceptable impact on the landscape character or areas of biological and geological significance. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy ENV4: Biodiversity	Development proposals which protect and enhance biodiversity connectivity and deliver a net gain in ecological value will be supported, taking into account the following: 1. For larger sites (i.e. sites of 5 houses or more) development proposals should include a detailed assessment of the existing natural capital and the scope to provide a net gain in natural capital; 2. Where appropriate to the site concerned, the ecosystem services provided by the development should enhance those that the site already contains. Planning proposals should explain the extent of each benefit; and 3. Support will be given to proposals that demonstrate a net gain in the existing natural capital. 4. New developments must avoid harming priority habitats, but actively seek to conserve and enhance these habitats to strengthen their capacity to regulate climate.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the support for developments that protect and enhance biodiversity connectivity and deliver net gain in ecological value. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy ENV5: Flooding	Flood prevention or mitigation measures will need to demonstrate an ecological gain, especially for aquatic biodiversity. Any scheme that could have an adverse impact on biodiversity and ecological capital will need to be accompanied by an ecological assessment that will demonstrate how the development will mitigate this risk.	The are no Likely Significant Effects of this policy on European Sites.

		This development management policy establishes the need for flood prevention or mitigation measures to demonstrate an ecological gain, especially for aquatic biodiversity. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy TM1: Parking Standards for New Residential Development	For all new residential developments, where practicable and feasible, the following minimum standards shall apply for the provision of off-road parking: • 1 bed dwelling, 1 off-road car parking space • 2 bed dwelling, 2 off-road car parking spaces • 3 bed dwelling, 2 off-road car parking spaces • 4+ bed dwelling, 3 off-road car parking spaces These standards will be applied within the curtilage of each dwelling or on-street in dedicated bays. The use of open parking spaces and car ports instead of garages will weigh in favour of a proposal. Parking areas such as parking courts or undercroft parking will be considered as an acceptable alternative where: a. The impact on the street scene and its function of providing car parking at each dwelling would otherwise be unacceptable; b. It can be shown that it would not lead to unplanned on-street parking; c. It is well related to the homes they serve with safe and convenient access for residents; d. It is not located on a main through route with open access to the public; e. It avoids provision of overly-large communal parking areas that are used by many residents, thereby making it more difficult to recognise legitimate users of the parking court; and f. A majority of dwellings have a clear view of the parking court from habitable rooms (not applicable to undercroft parking) or benefits from other informal surveillance. Additionally, in recognition that on-street parking could occur because of the needs of visitors, streets should be designed to safely accommodate some on-street parking. The	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the minimum standards for off-road parking that shall apply for all new residential developments. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.

	level of provision should be such that indiscriminate parking and the obstruction of footways and carriageways is avoided. Landscaping shall be used to avoid car parking being too obtrusive in the street scene.	
Planning Policy TM2: Electric vehicle charging points	Developers will be expected to provide each house that has on-plot parking with at least one electrical charging point per parking space accessible from either the driveway or garage/ cart shed. For dwellings with communal parking, flats and other developments, developers will be expected as a minimum to provide ducting and electricity supply to each car parking space to enable the installation of a charging point.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that developers will be expected to provide each house that has on-plot parking with at least one electrical charging point. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy TM3: Off-street public car parking	A proposal for an off-street car park in or adjacent to the town centre will be supported in principle provided it can be demonstrated that: • It will have a capacity that does not exceed that which is required to meet existing demand and forecast future demand over the plan period; • It does not materially increase traffic in the conservation area and lead to a decrease in air quality; • It provides sufficient electric vehicle charging points; and • It is designed and landscaped to minimise the impact of parked vehicles on the street-scene whilst still affording informal surveillance.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes the support for off-street car park in or adjacent to the town centre if it can demonstrate certain points. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy TM4: HGVs in the town centre	Any Construction Management Plan or HGV routing agreement required as part of a planning application will need to demonstrate that routes for HGVs avoid the conservation area and town centre as much as reasonably possible.	The are no Likely Significant Effects of this policy on European Sites.

		This development management policy establishes that any Construction Management Plan or HGV routing agreement required as part of a planning application will need to demonstrate that routes for HGVs avoid the conservation area and town centre as much as reasonably possible. There are no impact pathways that link this policy to European Sites. Therefore, the policy is screened out from Appropriate Assessment.
Planning Policy TM5: Sustainable transport and highway safety	New development should take every reasonable opportunity available to provide safe and convenient pedestrian and cycling access and connections to the existing pedestrian and cycling network and create new safe networks, including shared cycling/ walking routes and Green Corridors. This will include making appropriate provision for secure cycle parking in line with the Waveney Cycle Strategy 2016 or any update, especially in the town centre. Major planning applications will be expected to show how they can take advantage of opportunities to help deliver the Waveney Cycle Strategy 2016 or any update, including relevant route improvements where feasible, particularly to improve sustainable access to the town centre, the High School, and other community facilities. New estate design and layout strategies will be supported where they prioritise walking and cycling and create permeable, connected, safe communities with links to amenities in the community and to other residential areas and which improve connectivity within the community for both pedestrians and cyclists. Development that is well located and can provide safe and convenient walking access to the town centre, countryside, and local services and facilities and to bus stops will be supported. Walking and cycling networks should be supported by good signing to key destinations. As part of the promotion of sustainable transport, major developments should be laid out to incorporate natural surveillance of pedestrian routes and public open spaces.	The are no Likely Significant Effects of this policy on European Sites. This development management policy establishes that new developments should take every reasonable opportunity available to provide safe and convenient pedestrian and cycling access and connections to the existing pedestrian and cycling network and create new safe networks. All new developments will also need to provide evidence that highway safety, especially in relation to pedestrians and cyclists, has been considered and that the proposal includes measures that will make any potential impact on highway safety acceptable in planning terms. There are no impact pathways that link this policy to European Sites. Therefore, the

	Major development schemes should be designed to facilitate traffic speeds of 20mph or lower on residential streets or lanes where appropriate, and satisfactory arrangements for car parking must be provided in a well-designed and convenient way in accordance with the applicable car parking standards (see Planning Policy TM1) with a view to reducing any adverse impact on pedestrian or cyclist safety. All new developments will need to provide evidence that highway safety, especially in relation to pedestrians and cyclists, has been considered and that the proposal includes measures that will make any potential impact on highway safety acceptable in planning terms. To help deliver Green Corridors, the provision of off-road cycle routes and the footpath network should be integrated with opportunities for enhancing wildlife networks and habitats. Provision for an expanded cycling and footpath network should be integrated with opportunities for enhancing wildlife networks by utilising and enhancing green corridors and habitats along cycle routes and footpaths. These should be a composite element consistent with the Green Infrastructure Strategy (2015) and Cycling Strategy (2015) linking new and existing development with services and amenity space. In particular the Town Council will seek the implementation of a new cycleway and footpath connecting any major development to the west of St John's Road to Flixton Road in order to increase access to Stow Fen.	policy is screened out from Appropriate Assessment.