Habitats Regulation Assessment of the Development Management Policies Document

For South Norfolk Council

September 2013

Norfolk County Council

Natural Environment Team

Habitats Regulation Assessment of the Development Management Policies Document for South Norfolk Council

Executive Summary

- As required by the Conservation of Habitats and Species Regulations 2010, before deciding to give consent or permission for a plan or project which is likely to have a significant effect on a European site, either alone or in combination with other plans or projects, the competent authority is required to make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

- This document is a record of the Habitats Regulation Assessment (HRA) of the Development Management Policies Document, undertaken for South Norfolk Council, and should be read in conjunction with the Sustainability Appraisal of the impact of the Development Management Policies. This work complements the HRA undertaken for South Norfolk Council's Site Allocations Document and the Wymondham Area Action Plan.

- Four groups of plans are reviewed with respect to their conclusions with respect to potential in-combination effects. These are: the other documents that constitute the South Norfolk Council Local Plan including the Site Allocation Document; plans for The Greater Norwich Development Partnership, Great Yarmouth Borough Council, Breckland District Council, and The Broads Authority including local development plans and the Tourism Strategy.

- The Habitats Regulations Assessment relates to Special Protection Areas, Special Areas of Conservation and Ramsar Sites which together are referred to as 'International Sites'. An initial scoping exercise indentified nine International Sites that were subject to Test of Likely Significant Effects.

- The sites subjected to tests of likely significance were The Broads SAC & Ramsar Site and the Broadland SPA, The River Wensum SAC, the Norfolk Valley Fens, Breckland SPA and Breckland SAC, Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC.

- Having completed the Stage 1 Test, it is considered that there is sufficient confidence for significant effects to be unlikely and an Appropriate Assessment is not required for disturbance effects on any of the International Sites. Therefore it is concluded that there is no need to undertake further stages of the HRA process.

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Habitats Regulation Assessment of the Development Management Policies Document for South Norfolk Council

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Habitats Regulation Assessment of the Development Management Policies Document,

undertaken for South Norfolk Council

September 2013

1. INTRODUCTION

This is a record of the Habitats Regulation Assessment of the Development Management Policies Document, undertaken for South Norfolk Council as the Planning Authority. The Assessment is required by Regulations 61 of the Conservation of Habitats and Species Regulations 2010, in accordance with the EC Habitat Directive (Council Directive 92/43/EEC) before the council as the 'competent authority' under the Regulations can permit development to proceed.

1.1 OVERVIEW

As required by the Conservation of Habitats and Species Regulations 2010 (hereafter Habitats Regulations), before deciding to give consent or permission for a plan or project which is likely to have a significant effect on a European site, either alone or in combination with other plans or projects, the competent authority is required to make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

This document is prepared by the Natural Environment Team at Norfolk County Council on behalf of South Norfolk Council and provides a Habitats Regulations Assessment and Appropriate Assessment for the Development Management Policies Document. The purpose of this document is to assess the likely impacts, effects and mitigation associated with the local policies that may be required within the formal context of the Habitats Regulations.

The Development Management Policies Document being assessed
The Development Management Policies Document in South Norfolk contains 44 policies in four themes: Strategic policies, Economic dimension, Social dimension and Environmental dimension. Each policy is supported by a reasoned justification and background notes and the document has been subjected to a Sustainability Appraisal.

The Development Management Policies Document is part of a set of documents that together constitute The Local Plan for the future development of the South Norfolk Council area. Individual constituent documents of the Local Plan have

been independently subjected to Habitat Regulation Assessment: The Site Allocations Document and Wymondham Area Action Plan (AAP) were assessed by the Natural Environment Team, Norfolk County Council (2012) and The Joint Core Strategy was assessed by Mott Macdonald (2010). The current HRA on the Development Management Policies Document is to consider the potential impacts on International Sites from the policies in combination with the other documents.

1.2 LEGISLATION & PLANNING POLICY

The need for an appropriate assessment originally arose under the requirements of the EC Habitats Directive (92/43/EEC) and its implementation in the UK under the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation of Habitats and Species Regulations 2010 were published and consolidated the legislation, updated and incorporated the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 (the 1994 Regulations). On 25 July 2012, Defra laid "The Conservation of Habitats and Species (Amendment) Regulations 2012" before Parliament. These Regulations came into force on 16 August 2012.

Regulation 61(5) states that "In the light of the conclusions of the assessment, and subject to regulation 62 (considerations of overriding public interest), the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site ". Regulation 61(6) also states "In considering whether a plan or project will adversely affect the integrity of the site, the authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given."

International sites covered by the Habitat Regulations
The Habitats Regulations Assessment relates to Special Protection Areas (SPAs), Special Areas of Conservation (SAC) and Ramsar Sites.

SPAs
SPAs are sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds (79/409/EEC), more commonly known as the Birds Directive. They are classified for rare and vulnerable birds, listed in Annex I of the Birds Directive, and for regularly occurring migratory species. Regulation 8 of the 2012 Regulations substitutes regulation 9 of the 2010 Regulations, to provide that public bodies must exercise their conservation functions specifically so as to comply with the Birds Directive.

SACs
SACs are classified in accordance with EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Article 3 of this Directive requires the establishment of a European

network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive.

SPAs and SACS are known as the Natura 2000 network and are commonly referred to as 'European Sites'.

Ramsar Sites
Ramsar Sites are sites qualifying under the International Convention on Wetlands of International Importance, 1971, known as the Ramsar Convention (amended by the Paris Protocol, 1992). Ramsar Sites are not protected in UK law by the Birds and Habitats Directives; however parliament has decreed that, unless otherwise specified, procedures relating to SPAs and SACs will also apply to Ramsar Sites. This was reiterated in the National Planning Policy Framework (DfCLG, 2012). Thus, in this report, the term 'International Sites' is used to refer to Ramsar sites as well as SACs and SPAs.

Appropriate assessment
An appropriate assessment is a decision by a 'competent authority', in this case South Norfolk Council, as to whether the proposed plan or project can be determined as not having an adverse effect on the integrity of any European sites.

An adverse effect on integrity is one that prevents the site from maintaining the same contribution to favourable status for the relevant feature or features, as it did when the site was qualifying. Only where a plan or project can be determined by the competent authority as not having an adverse effect on site integrity can it be allowed to proceed. The favourable conservation status of the site is defined through the site's conservation objectives and it is against these objectives that the effects of the plan or project must be assessed.

1.3 THE ASSESSMENT PROCESS & METHODOLOGY PROCESS

The Appropriate Assessment process is outlined below. This involves evidence gathering followed by three stages:

- **Evidence Gathering.** Collation of documentation relating to the plan. Collecting information on relevant European sites, their conservation objectives and characteristics.

- **Stage 1: The 'test of likely significant effect'.** Establishing whether a plan is 'likely to have a significant effect' on a European site, and therefore requiring the Appropriate Assessment.

- **Stage 2: Assessment of whether there is an effect on site integrity**. This is potentially a two-stage process, with a consideration of whether

there are likely to be effects, followed if necessary by a detailed consideration of site-specific factors.

- **Stage 3: Reassessment.** If there is an effect on site integrity then the project should be reassessed with the inclusion of compensation and a repeat of stage 2 should then be completed.

1.4 EVIDENCE GATHERING

Identification of European sites was undertaken utilising the databases held by Norfolk Biodiversity Information Service (the County Records Centre for Biological and Geographical records, hereafter referred to as NBIS) and the online Multi-Agency Geographic Information for the Countryside database (hereafter referred to as MAGIC; www.magic.gov.uk). Data on the European sites, including qualifying features were taken from the Joint Nature Conservation Committee website (www.jncc.gov.uk); data on the component SSSIs, primarily the condition assessment, were taken from the Natural England website (www.naturalengland.org.uk).

Definition of 'Site Integrity'

Based on definitions within Article 1 of the Habitats Directive and following English Nature (2004), now Natural England, site integrity is defined as:

For habitats:

- Their range and area must be stable or increasing;
- The species structure and functions necessary for long-term maintenance of the habitat exist and are likely to continue to exist for the foreseeable future; and
- The status of the typical species is considered to be favourable.

For species:

- The population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and
- The natural range is stable and likely to continue to be, and there is and will probably continue to be a sufficiently large habitat to maintain its population on a long term basis.

To help identify likely effects and potential mechanisms that could affect site integrity, English Nature (1999, 2004) proposed a checklist of questions. For the assessment to conclude that there are no adverse effects then it is necessary to show that:

- The area of Annex I habitats (or composite features) will not be reduced;
- There will be no direct effect on the population of the species for which the site was Qualifying or classified;
- There will be no indirect effects on the populations of species for which the site was Qualifying or classified due to loss or degradation of their habitat (quantity/quality);
- There will be no changes to the composition of the habitats for which the site was Qualifying (e.g. reduction in species structure, abundance or diversity that comprises the habitat over time); and
- That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was Qualifying or classified.

If it is concluded that one or more of the above is not met, or if there is uncertainty, then it is necessary to consider further site-specific factors in order to reach a decision. The key site-specific factors that need to be considered when forming judgments on site integrity (English Nature, 2004) are:

- Scale of impact,
- Long term effects and sustainability,
- Duration of impact and recovery/reversibility,
- Dynamic systems,
- Conflicting feature requirements,
- Off-site impacts, and
- Uncertainty in cause and effect relationships and a precautionary approach.

2. IN COMBINATION EFFECTS

2.1 OVERVIEW

It is a requirement of the Habitats Regulations to undertake an in-combination assessment of plans and projects. A project or plan that affects a European site in some way, but where these effects are unlikely to be significant, may be significant when considered in combination with other plans. There are a number of plans prepared for neighbouring local authorities which may act in combination with the Development Management Policies Document for South Norfolk Council to result in impacts on the integrity of sites.

Three groups of plans are reviewed with respect to their conclusions with respect to potential in-combination effects. These are plans for

- South Norfolk Council;
- The Greater Norwich Development Partnership, of which South Norfolk Council LPA is a part;
- Great Yarmouth Borough Council;
- Breckland District Council, and
- The Broads Authority (including local development plans and the Tourism Strategy (Broads Authority, 2011).

2.2 SOUTH NORFOLK COUNCIL

The Development Management Policies Document being assessed is part of a set of documents that together constitute The Local Plan for the future development of the South Norfolk Council area. Individual constituent documents of the Local Plan have been independently subjected to Habitat Regulation Assessment: The Site Allocations Document and Wymondham Area Action Plan (AAP) were assessed by the Natural Environment Team, Norfolk County Council (2012) and The Joint Core Strategy was assessed by Mott Macdonald (2010). A Sustainability Appraisal of the impact of the Development Management Policies is provided in a separate document.

Site Allocation Document and Wymondham AAP

Site allocations in South Norfolk are proposed for 53 settlements ranging from Norwich Fringe Parishes (e.g. Eaton, Costessey), to main towns (Diss, Harleston), key service centres (Hethersett, Loddon/Chedgrave) and service villages as detailed in the Joint Core Strategy.

The HRA of the Site Allocation Document/Wymondham AAP (NCC Environment Team, 2012) assessed nine International Sites that were not scoped out at an initial stage, and subjected them to tests of likely significance relating to potential

impacts from recreational disturbance and impacts from disturbance to ground water flows. Having completed the Stage 1 test, it was concluded that there was sufficient confidence for significant effects to be unlikely and therefore an Appropriate Assessment was not required for adverse impacts on any of the International Sites.

2.3 GREATER NORWICH DEVELOPMENT PARTNERSHIP AREA

Joint Core Strategy (Mott Macdonald, 2010)

As described by Mott Macdonald, the 2009 Joint Core Strategy (JCS) consultation report was subject to a Stage 1 Test of Likely Significant Effects and the following JCS policies were identified as having the potential to have significant effects on European and Ramsar designated sites:

- Policy 3: Energy and Water (which underpins Policy 10 & 12);
- Policy 4: Housing (which underpins Policy 10 & 12);
- Policy 6: Access and transportation;
- Policy 10: Location for major new or expanding communities, and;
- Policy 12: The remainder of the Norwich urban area, including the fringe parishes.

The Stage 2 Appropriate Assessment considered that all the above policies with the exception of Policy 6 were likely to have a significant impact, on the basis that the relevant schemes would be considered at the project level and not directly related to JCS policies.

Two main issues were considered potentially significant: hydrological issues and impacts from human disturbance. With regards to hydrological issues, measures are underway "*towards a resolution of the longer term water resource requirement*" (Anglian Water, Environment Agency and Natural England, 2010).

Increased disturbance was assessed as a potentially significant impact of policy 4 (with any in-combination disturbance impacts from policy 12 covered under policy 4). As described for policy 4, site integrity may be impacted from: "*In-combination impacts associated with area-wide growth, resulting in increased visitor pressure on European designated sites in combination with growth in neighbouring local authority areas.*" The identified International Sites were:

- Broads SAC; Broadland Ramsar & SPA;
- Breckland SPA & SAC;
- Great Yarmouth North Denes SPA;
- Winterton – Horsey Dunes SAC; and
- North Norfolk Coast SAC, SPA & Ramsar.

2.4 BROADS AUTHORITY AREA

Core Strategy (Broads Authority, 2006)

The Habitats Regulations Assessment for the Core Strategy concluded that none of the policies presented a significant risk to site integrity. Specifically it concluded that "*any risks will be prevented by the Holistic interpretation of Core Strategy policies, using Core Strategy Policy 2 for sites designated with European and National Importance*". Core Strategy Policy 2 states that: "*policies will take into account National & European designated conservation sites*".

The most relevant Core Strategy Policies (CS) to which this applies are CS 2 (protecting and enhancing new water space), CS 4 (creation of new resources), CS 9 (sustainable tourism), CS 10 (tourist and recreation development), CS 14 (additional moorings), CS 15 (safe navigation), CS 16 and CS 17 (accessing The Broads in a sustainable manner) and CS 19 (sustainable locations for medium/larger visitor developments.

Two sites were identified as possibly at risk of impacts namely Breydon Water SPA and Ramsar Site (CS 10); and The Broads SAC/ Ramsar Site/ Broadland SPA (CS 10, CS 16 and CS 17). For both sites CS 2 is identified as the key policy for justifying site-by-site assessment of impacts.

Development Management Policies (Wildfrontier Ecology, 2011)

For the Broads Development Management Policies, the HRA assessment was undertaken as an iterative process. Revisions to the wording and the subsequent strengthening of some policies resulted in the conclusion that impacts on site integrity were unlikely. However, if a proposal is considered in the context of a given policy to have an effect on an internationally designated site then it will need to be considered against the Habitats Directive and a project level Appropriate Assessment will need to be undertaken.

Site Specific Policies (Interim Draft HRA) (Wildfrontier Ecology, 2012)

An assessment of the 'finer scale' policies within the Broads Authority concluded that significant effects on site integrity were possible for The Broads SAC, Broadland SPA and Winterton – Horsey Dunes SAC and Great Yarmouth North Denes SPA. The draft policies of possible concern were those potentially resulting in disturbance or hydrological issues at the named settlements of Cantley, Brundall, Great Yarmouth marina, Horning and Oulton Broad. Non-settlement draft policies with potential impacts were those relating to management works at Horsey and St Benet's Abbey. In each case, minor revisions to the wording of individual draft policies resulted in a revised assessment where no impact on site integrity was concluded.

Tourism Strategy (Broads Authority 2011)

The Tourism Strategy for The Broads has not been subject to a HRA (confirmed by email from an officer from the Broads Authority 29 January 2013). The Tourism Strategy aspires that by the year 2015 there will be increased visitors to the Broads, with proportionally more in the southern Broads and with more visitors out of season. Ecotourism is recognised as a major product and market opportunity, and the strategy aspires that there is tangible evidence that overall environmental quality has further increased with the support of tourism.

With particular relevance to the current HRA work for the South Norfolk Council Site Allocation documents, the Tourism Strategy makes reference to local residents (as opposed to visitors from outside the area). In particular, an area for action included a desire to raise local residents' awareness of the Broads product (p42). It states that the "*continuing importance of the day visitor market has been highlighted in this strategy. Business can be generated not only from residents in and around the area but also from their visiting friends and relatives. It is believed that local awareness of Broads products and experiences is still quite patchy*."

Also relevant in the current HRA work are the aims of the Tourism Strategy to:

- Strengthen visitor awareness of opportunities in the peripheral parts of the Broads by providing good information about what can be found at the end of each waterway and how it may differ from the busier, more congested parts, by encouraging further development of relevant product in the upper reaches, for example by canoe, by providing trails and guided walks and wildlife trips and by taking care to manage the scale and distribution of new activity in sensitive areas, with appropriate advice from conservation managers.

- Monitor proposed improved or promoted access to ensure adequate protection is in place to safeguard Qualifying and important wildlife habitats and species.

2.5 GREAT YARMOUTH BOROUGH COUNCIL

Waterfront Area Action Plan and Core Strategy of the Great Yarmouth Local Development Framework

As reported by Grant (2010) in the HRA of the Waterfront Area Action Plan, the Core Strategy identified the following likely significant effects:

- Recreational pressures from increased numbers of visitors to Winterton-Horsey Dunes SAC, Great Yarmouth North Denes SPA and Breydon Water SPA/Ramsar;

- Urban effects, such as litter and lighting, on Winterton-Horsey Dunes SAC and Great Yarmouth North Denes SPA; and

- Surface run-off resulting in a deterioration of water quality in watercourses, which in turn could have an effect on the Broads SAC and Broadlands SPA/Ramsar and Breydon Water SPA/Ramsar.

The HRA of the Waterfront Area Action Plan concluded that there could be possible impacts on site integrity from water quality and hydrology of The Broads SAC/Broadlands SPA/Ramsar and Breydon Water SPA/Ramsar. It also recognised potential impacts from recreation on the dunes at Winterton-Horsey Dunes SAC and disturbance at Breydon Water SPA/Ramsar and disturbance to nesting little tern at Great Yarmouth North Denes SPA.

The Consultation Draft of the HRA of the Great Yarmouth Local Plan Core Strategy (Footprint Ecology & David Tyldesley & Associates, 2012) detailed and up-dated assessment of current and future recreational use of on the Winterton-Horsey Dunes SAC, Breydon Water SPA/Ramsar and Great Yarmouth North Denes SPA including a full discussion of visitor surveys and potential impacts.

2.6 BRECKLAND DISTRICT COUNCIL

Core Strategy and Development Control Development Plan Document

In considering the implications of the Breckland Core Strategy and Development Control Policies document for European sites, an Appropriate Assessment was undertaken (Liley D. *et al.*, 2008). The document concludes that

"A number of policies within this proposed Core Strategy and Development Control Policies document were considered to have significant effects that would be likely, or that a precautionary approach would need to be taken as it could not be determined that particular plan policies would not have a significant effect upon any European site. In light of the findings of the Habitats Regulations Assessment, it was recognised that mitigation measures must be put in place to remove any significant effects or likely significant effects that the plan may have on European sites. Mitigation measures included amendments made to policies to remove elements that could have an effect, or to require other actions that can eliminate any effects. The policies in this document that have an effect on European sites have been amended to ensure that the qualifying features are not harmed, as well as considering other measures that will be necessary. These mitigation measures are incorporated throughout the document where necessary. In some cases, the mitigation measures necessary have in themselves had a significant role in shaping the final direction of the Core Strategy as well as particular policies."

In particular, the potential for new development to lead to disturbance on breeding birds was recognised. To ensure that there are no significant effects on European habitats and species a policy was created to ensure that new development will only be permitted within 1,500m of SPAs that are suitable for stone curlew if it can be demonstrated, through an appropriate assessment under the Habitats Regulations, that there will be no adverse impact on the qualifying features. Beyond the SPA boundary, on other land suitable for stone curlew or where they are present, a 1,500m development restriction buffer operates. These are areas where there have been five nesting attempts or more since 1995 or where other conditions are suitable, such as soil type. In these areas development may also be acceptable providing alternative land outside the SPA can be secured to mitigate any potential effects.

3. CHARACTERISING POTENTIAL IMPACTS & INITIAL SCOPING

3.1 INTRODUCTION

The main potential impacts identified in relation to International Sites from development within the South Norfolk have been identified in the HRA for the Joint Core Strategy and the South Norfolk Council Site Allocation Document are with issues relating to water abstraction and water disposal and levels of recreational disturbance. The HRA for the South Norfolk Council Site Allocation Document concluded that that there was sufficient confidence for significant effects to be unlikely and therefore an Appropriate Assessment was not required for adverse impacts on any of the International Sites. The current HRA on the Development Management Policies Document is to consider the potential impacts on International Sites from the policies in combination with the other documents in the Local Plan.

The potential impacts from development in South Norfolk are discussed below.

Water abstraction and water disposal

In the Habitats Regulations Assessment of the Joint Core Strategy, hydrological issues were assessed. The GNDP water cycle study (Scott Wilson, 2010) fully assessed the potential impacts of water abstraction and water disposal. As such, they are not addressed in detail in the current HRA work here. The suitability of this approach was agreed with Natural England in early consultations and confirmed in an email of 13 May 2013 (NE reference: 83415). Since the publication of the original Mott Macdonald (2010) HRA, further planning and legal processes were undertaken, which have been summarised by Anglian Water, Environment Agency and Natural England (2012) as follows:

"*In brief, (the Appropriate Assessment) concluded that it was highly unlikely that the (Joint Core Strategies) JCS policies would have a significant direct or indirect impact on European and Ramsar designated sites. However, the report highlighted some areas of uncertainty regarding potential in combination and cumulative effects associated with water resources, water quality, water efficiency, growth and tourism on such sites, because of the dependence on the effectiveness and implementation of mitigation measures and actions required to avoid adverse impact on site integrity." The mitigation measures suggested were:*

- *The implementation of green infrastructure developments*
- *The allocation of green space to protect specific natural assets and designated sites to be implemented through area action plans.*
- *The implementation of water infrastructure improvements (for water resources and waste water treatment) and water efficient measures as recommended in the water cycle study, enforced through Anglian*

Water's Water Resource Management Plan in ensuring that sufficient water supplies can be made available to meet planned growth and as supported by the position statements issued by Anglian Water, Natural England and the Environment Agency "In the short term, Anglian Water has demonstrated that their existing licensed resources supplying the Greater Norwich area are sufficient to serve projected development beyond the current AMP which ends in 2015, while capping abstractions at Costessey below historic levels. This has been established through an addendum to the original HRA.

While a solution to the longer term water resources issue has not been finalised, the process is progressing as agreed, and Anglian Water has submitted a document outlining a range of potential solutions. This is currently subject to discussions with the other bodies.

Under the circumstances, all parties agree that the conclusion of the Habitats Regulations Assessment dated February 2010 remains unchanged, subject to the progress noted above in working towards a resolution of the longer term water resource requirement."

Disturbance from Recreation

Disturbance from recreation can involve a number of factors of which the ones of principal importance to this assessment are trampling effects on vegetation and the disturbance of birds, both on breeding birds and those that winter in the East of England. The most visible impact on most habitats is direct trampling effects, destroying vegetation, preventing re-growth and compressing soils. Related mechanisms include nutrient enrichment from dog fouling and even irresponsible behaviour such as fires and littering.

Assessing the potential impacts from recreational disturbance is not straightforward. Species react differently to one another; effects may vary seasonally and in different weather and relating the behaviour of individual animals to population integrity is complicated. Furthermore data on human visitor numbers and usage across all months and all areas of International Sites will always be deficient. Some of the issues relating to recreational disturbance have been succinctly summarised by Ecology Consultancy (2013) and are included in Box 1 below.

Box 1: Recreational disturbance from housing growth – Problems in assessing impact on biodiversity (from Ecology Consultancy, 2013).

The significance of disturbance is one of the 100 key policy questions for ecological research (Sutherland *et al*., 2006). A key question in disturbance research is how to scale individual impacts to the population level, which is required when establishing effects on site integrity. The interpretation of disturbance effects is potentially confounded by a range of factors including differences in behavioural responses among species, the impact on individual condition or 'fitness' and consequent impacts on survival and reproduction. Effects are also dependant on the availability of alternative feeding areas and resource availability and weather (Goss-Custard *et al.,* 2006).

Among the factors that confound the interpretation of observational studies of disturbance is the potential difference among species in their responses. Thus, some bird species may fly away or leave an area when disturbed but others may remain but nevertheless feed at a lower rate, with impacts on individual fitness. Some studies may interpret such an absence of an obvious response as tolerance or habituation to disturbance, while the opposite may be true (Gill *et al*., 2001a).

Thus, in reviewing the impacts of disturbance on birds a precautionary approach should be applied, with an appreciation of the interplay of factors and difficulties in the scaling from behaviour to individual and population level effects.

Projecting increases in disturbance in relation to housing is difficult. Although some work has shown a correlation between housing and visitor numbers (e.g. Jones *et al*., 2003) the predictive models work well for the numbers of visitors arriving by foot but are much less able to show links between housing numbers and density and visitors arriving by car (Liley *et al*., 2006). A myriad of factors would be expected to determine the numbers of visitors, including general factors such as the weather and economic conditions, more regional factors such as road and rail accessibility, and local factors such as the proximity of toilets and other facilities. The availability and/or introduction of alternative facilities that may displace visitor numbers is also a key issue, particularly in ensuring that estimates of visitor impact are made on a consistent basis.

Even with an understanding of the actual and projected numbers of visitors, the disturbance experienced by individual birds will vary according to local conditions, possibly including proximity, sight lines and the feeding quality of habitats. Generally, however, disturbance which limits food accessibility at critical times of the year, particularly for open-habitat dwelling bird species, as well as disturbances on the breeding grounds, are the most disturbing types of activity.

Generally, however, visitors to wetland reserves can be appropriately managed by the use of spatial and temporal zoning of activities, screening at sensitive locations and visitor management policies that reflect the site specific conditions and the species potentially affected. Details are provided in Kirby et al. (2004). The RSPB and Wildlife Trusts successfully integrate visitors and nature conservation across a broad range of sites in the UK. Further, the proximity of the disturbance source and its type, substantially affects a bird species response to that disturbance. Disturbance from vehicles along roads adjacent to sites of bird interest may be generally habituated for whereas people walking through an open area can cause significant disturbance to certain species that rely on open habitats with good sight-lines, but this type of disturbance is far less disturbing than someone using a shotgun, for example (see Hill *et al*., 1997).

3.2 SCOPING OF SITES

The International Sites identified in the HRA produced for the Joint Core Strategy (Mott Macdonald, 2010) and assessed in the HRA Site Allocation Document (NCC Natural Environment Team, 2012) were:

- The Broads SAC; Broadland SPA and The Broads Ramsar Site;
- Breckland SPA & SAC;
- Great Yarmouth North Denes SPA;
- Winterton – Horsey Dunes SAC;
- North Norfolk Coast SPA, SAC and Ramsar Site.

Although these are the sites listed in HRA for the JCS, there are other sites that are near to the South Norfolk District boundary (Figure 1). All such sites are considered in this scoping exercise.

International Sites within South Norfolk:

It should be recognised that in comparison to the rest of the county, the district of South Norfolk has very few international sites, and none are entirely within the district boundary. Most of the Norfolk International Sites are not continuous but are comprised of a number of separate 'component units'. Four small component units of The Broads SAC/Broadland SPA are within South Norfolk between Surlingham and Loddon with two other very small component units near Geldeston on the District's southern boundary. The River Wensum SAC forms the northern boundary of the district in the area near Costessey although for most of this section the SAC designation is mostly confined to the river channel rather than the wider floodplain.

The HRA work for the JCS did not include the Norfolk Valley Fens SAC, a large group of around 20 component units dispersed widely through the county. Two component units of the Norfolk Valley Fens SAC are within South Norfolk, Coston Fen near Runhall and Florden Common.

International sites outside of the District:

The majority of The Broads SAC/Broadland SPA/Ramsar sites are to the north of the South Norfolk District being north of the River Yare between Great Yarmouth and Stalham in North Norfolk. Some small component units are associated with the River Waveney to the west of Lowestoft. Breydon Water SPA is to the east of the district.

The extensive Breckland SPA/SACs are located to the south-west of the district in Breckland area of Norfolk and Suffolk with the nearest component units approximately 10 km from the boundary alongside the A11 (Bridgham and Brettenham Heath SSSI, Weeting Heath SSSI, Stanford Training Area SSSI,

Cranberry Rough SSSI) and around 7km from the South Norfolk District boundary near to Diss (Breckland Forest SSSI).

The North Norfolk Coast International Sites are >40km from the district boundary at the nearest point, whilst the Benacre to East Bavents SAC/SPA are approximately 10km to the south. A component unit of the Waveney and Little Ouse Valley Fens SAC is located near to the District Boundary near Diss (Redgrave and Lopham Fen SSSI). This site is partly in Breckland DC area and partly in Mid Suffolk DC and is also a Ramsar site.

3.3 SUMMARY OF INTERNATIONAL SITES ASSESSED

The full list of 15 International Sites assessed as part of this report is listed below and their locations are shown in Figure 1.

- The Broads SAC; Broadland SPA and The Broads Ramsar Site;
- Breckland SPA & SAC;
- Great Yarmouth North Denes SPA;
- Winterton – Horsey Dunes SAC;
- North Norfolk Coast SPA, SAC and Ramsar Site
- Norfolk Valley Fens SAC
- Breydon Water SPA
- Waveney and Little Ouse Valley Fens SAC
- Benacre to East Bavents SAC and SPA

3.4 INITIAL SCOPING-OUT OF INTERNATIONAL SITES

An initial scoping was undertaken on to consider if potential impacts from the South Norfolk Development Management Policies were likely on the International Sites listed above. This process considered the habitats and species for which the sites were designated (the 'designated features'), the vulnerabilities of the sites as described by Natural England, and the distance of the sites to the settlements and areas of South Norfolk for which the Development Management policies will apply. This information and justification is listed in Table 1.

Following this initial scoping, each of the International Sites where potential impacts from the Development Management Policies were considered possible, were considered in greater detail in Section 4.

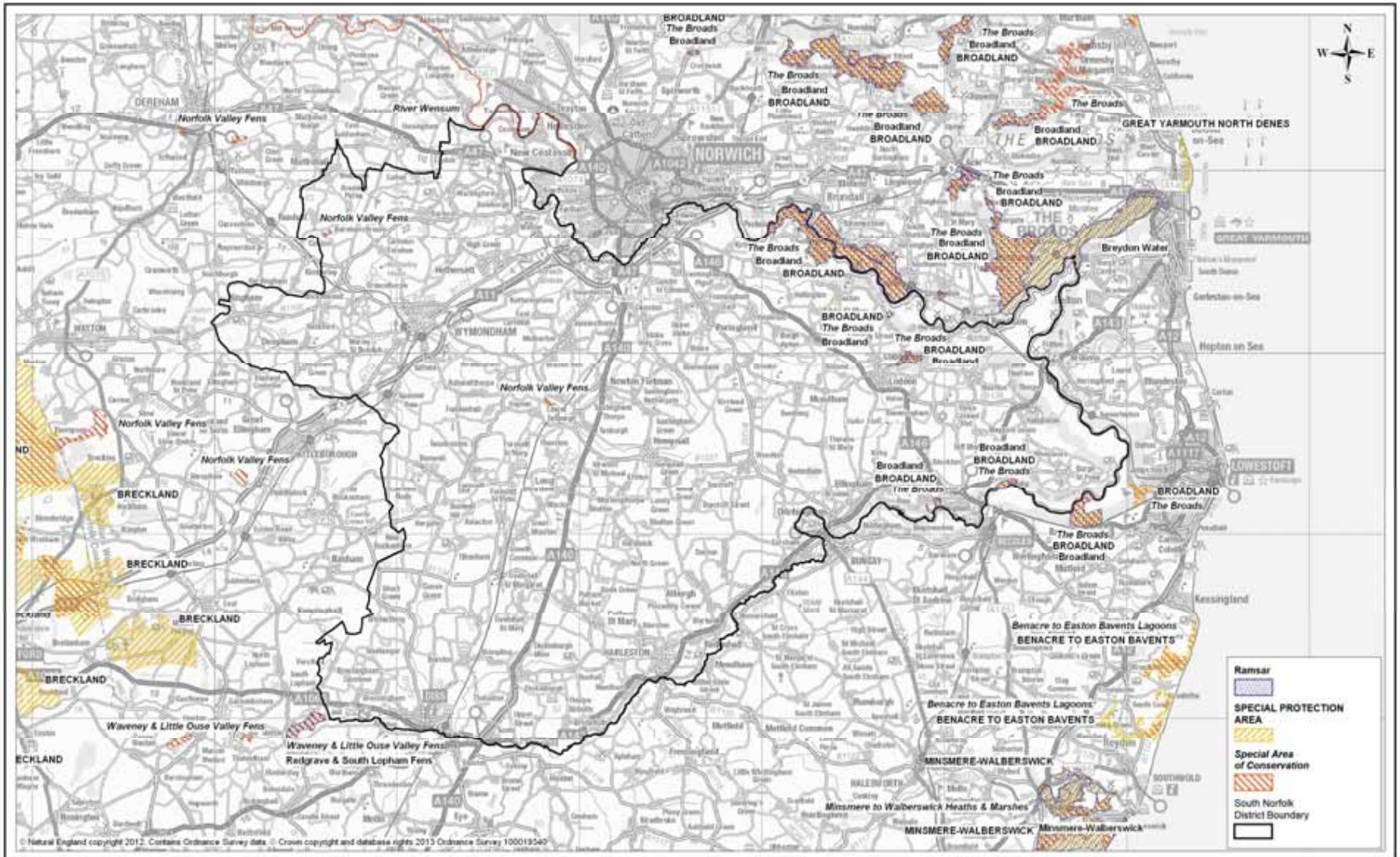

Figure 1: International Sites mentioned in the text

Scale 1:190000

Compiled by L. Carroll on 30 April 2013

NBIS
Norfolk Biodiversity Information Service

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Table 1: International Sites with component units in or near South Norfolk District Boundary, and assessment of likelihood of potential impacts.

Site name	Status			Potential impact possible Where the answer is 'yes', sites will be subjected to test of likely significance
The Broads	Ramsar	Wetland habitats, plants birds, and other animals.	None cited, but probably as for SAC with disturbance likely to be a factor. Estimates of tourist numbers to the Broads and environs are estimated at 6.9 million p.a. of which 84% are day visitors (Broads Authority, 2011)	**YES,** some component units of International Sites are within South Norfolk therefore the potential for adverse impacts from DM policies can not be scoped out
The Broads	SAC	Wetland vegetation, plants and other animals.	Sea level rise, abstraction reducing flows in northern rivers, eutrophication from sewage and agricultural runoff	**YES,** some component units of International Sites are within South Norfolk therefore with the potential for adverse impacts DM policies can not be scoped out
Broadland	SPA	Wetland birds.	None cited, but probably as for The Broads SAC with disturbance likely to be a factor. Estimates of tourist numbers to the Broads and environs are estimated at 6.9 million p.a. of which 84% are day visitors (Broads Authority, 2011)	**YES,** some component units of International Sites are within South Norfolk therefore with the potential for adverse impacts DM policies can not be scoped out
River Wensum	SAC	Aquatic vegetation and animals.	Development on flood plain, agricultural eutrophication and run-off, abstraction, non-native species	**YES,** some component units of International Sites are within South Norfolk therefore with the potential for adverse impacts. Potentially used for recreation but facilities very limited. But due to proximity to growth in Costessey/Easton, the most southerly component units cannot be scoped out.
Norfolk Valley Fens	SAC	Wetland vegetation and plants; invertebrates	Reduction in management and groundwater abstraction	**YES,** some component units of International Sites are within South Norfolk therefore with the potential for adverse impacts

Breydon Water	SPA	Wetland and estuarine birds	Disturbance to a high tide roost of wading birds, drainage of wet grassland, 'pressure' from development of Great Yarmouth	No, about 20km distant from SNC boundary and unlikely to be directly affected by DM policies; adjacent to a major tourist area but with very limited facilities and distant or inaccessible from settlements in South Norfolk with substantial growth proposed in Gt Yarmouth and Lowestoft. The HRA work for the Gt Yarmouth Core Strategy concluded that levels of access will continue to be low and will therefore have no significant disturbance effect on the SPA (Footprint Ecology & David Tyldesley, 2012)
Breydon Water	Ramsar	Wetland and estuarine birds	None cited, but probably as for the SPA Great Yarmouth	No, about 20km distant from SNC boundary and unlikely to be directly affected by DM policies; adjacent to a major tourist area but with very limited facilities and distant or inaccessible from settlements in South Norfolk with substantial growth proposed in the nearer settlements of Gt Yarmouth and Lowestoft. The HRA work for the Gt Yarmouth Core Strategy concluded that levels of access will continue to be low and will therefore have no significant disturbance effect on the SPA (Footprint Ecology & David Tyldesley, 2012)
North Denes	SPA	Breeding little terns	Reduced accretion, predators and disturbance from people and dogs	No, about 30km distant from SNC northern boundary and unlikely to be directly affected by DM policies and additional numbers of residents in South Norfolk will be minor relative to proposed housing allocation of 4000 in the Gt Yarmouth BC area. Further, in the context of Gt Yarmouth as a major tourist resort, additional visitor pressure is likely to contribute significantly. The presence of the designated feature – a colony of breeding Little Terns – is advertised by the local tourism website and is wardened by RSPB Volunteers (Enterprise GY, 2012)
Winterton – Horsey Dunes	SAC	Dune habitats and great crested newts	Cessation of erosion and accretion due to sea defences, beach feeding with inappropriate sand, water abstraction and visitors causing disturbance, erosion & fires	No, about 30km distant from SNC northern boundary and unlikely to be directly affected by DM policies, part of a major tourist area but with very limited facilities. The site is distant from most South Norfolk Settlements with other larger housing schemes closer in Broadland District Council area and Great Yarmouth Area. The HRA work for the Gt

				Yarmouth Core Strategy concluded that it was "*unlikely proposed development of such a scale as to have an effect will be sufficiently close to the site for effects to occur at significantly increased levels*" (Footprint Ecology, 2012).
Breckland	SPA	Heathland birds	Nitrogen deposition, egg collecting.	**YES**, distant from the most of the South Norfolk Settlements and unlikely to be directly affected by DM policies; available data showing some 63% of visitors to Breckland countryside tourism locations from within 10km (Dolman *et al*., 2008). Additional numbers of residents from development likely to be minor relative to proposed housing allocations in the Breckland DC area. Some parts include visitor facilities but majority of site remote from facilities. However, some settlements have reasonable or good road access to the SPA – Diss on A1066 and settlements on A11 including Hethersett, Wymondham and Cringleford. The probable increase in size of these settlements means the component units near to SNC (Bridgham and Brettenham Heath SSSI and units of Breckland Forest SSSI) can not be scoped out.
Breckland	SAC	Heathland vegetation and habitats; Breckland meres and alluvial forest; great crested newt and barbastelle bat	Reduction in grazing and cutting, nitrogen deposition, recreation, groundwater abstraction	**YES,** distant from the most of the South Norfolk Settlements and unlikely to be directly affected by DM policies; available data showing some 63% of visitors to Breckland countryside tourism locations from within 10km (Dolman *et al*., 2008). Additional numbers of residents from development likely to be minor relative to proposed housing allocations in the Breckland DC area. Some parts include visitor facilities but majority of site remote from facilities. However, some settlements have reasonable or good road access to the SPA – Diss on A1066 and settlements on A11 including Hethersett, Wymondham and Cringleford. The probable increase in size of these settlements means the component units near to SNC (Bridgham and Brettenham Heath SSSI and units of Breckland Forest SSSI) can not be scoped out.
Redgrave & South Lopham Fens	Ramsar	Wetland habitat and a spider	None cited, but probably as for the Waveney and Little Ouse Valley Fens	**YES,** very small site, >5km distant from settlements with significant proposed development (Diss) and with little attraction to casual visitors and few facilities. Unlikely to be

				directly affected by SNC DM policies. But can not be scoped out given the proximity to the probable number of new dwellings in Diss and nearby settlements.
Waveney and Little Ouse Valley Fens	SAC	Wetland vegetation; Desmoulin's whorl snail	Loss of traditional management, water abstraction	**YES,** very small component unit (Redgrave & South Lopham Fens), >5km distant from settlements with proposed development (Diss) and with little attraction to casual visitors and few facilities. Considered unlikely to be directly affected by SNC DM policies, but can not be scoped out given the probable number of new dwellings in Diss.
Benacre to East Bavents	SPA	Wetland birds	Sea level rise and erosion.	No, distant from settlements in the Site Allocations and unlikely to be directly affected by DM policies with other larger housing schemes closer at Great Yarmouth, Lowestoft and Beccles. The HRA work for the Gt Yarmouth Core Strategy assessed the cumulative growth as not likely to cause impacts (Footprint Ecology & David Tyldesley, 2012)
Benacre to East Bavents Lagoons	SAC	Coastal lagoon habitat and alluvial forest	None cited, but probably as for the SPA	No, distant from settlements in the Site Allocations and unlikely to be directly affected by DM policies with other larger housing schemes closer at Great Yarmouth, Lowestoft and Beccles. The HRA work for the Gt Yarmouth Core Strategy assessed the cumulative growth as not likely to cause impacts (Footprint Ecology & David Tyldesley, 2012)
The Wash and North Norfolk Coast	SAC	Coastal and marine habitats and vegetation; common & grey seal and otter	Sea level rise, storm surges, erosion, abstraction and disturbance from tourism	No, largely to the west part of the North Norfolk coast, this site is scoped-out on the basis of distance (>40km) and that substantial parts are managed as nature reserves with subsequent controls on visitor access. distance to SNC means very unlikely to be directly affected by DM policies.
North Norfolk Coast	SAC	Coastal and marine habitats and vegetation; common seal, otter and great crested newt and petalwort	Sea level rise, storm surges, erosion, abstraction and disturbance from tourism	No, a major tourist area. Residents from South Norfolk will be likely to make a small contribution to day visitors given drive times to the coast and the proposed growth in the north of the county (North Norfolk DC, Norwich City, Broadland DC, Breckland DC and Kings Lynn BC); distance to SNC means very unlikely to be directly affected by DM

				policies.
North Norfolk Coast	SPA	Wetland and coastal birds	Sea level rise, storm surges, erosion, abstraction and disturbance from tourism	No, a major tourist area. Residents from South Norfolk will be likely to make a small contribution to day visitors given drive times to the coast and the proposed growth in the north of the county (North Norfolk DC, Norwich City, Broadland DC, Breckland DC and Kings Lynn BC); distance to SNC means very unlikely to be directly affected by DM policies.
North Norfolk Coast	Ramsar	Coastal and marine habitats and vegetation; birds and other animals	Sea level rise, storm surges, erosion, abstraction and disturbance from tourism	No, a major tourist area. Residents from South Norfolk will be likely to make a small contribution to day visitors given drive times to the coast and the proposed growth in the north of the county (North Norfolk DC, Norwich City, Broadland DC, Breckland DC and Kings Lynn BC); distance to SNC means very unlikely to be directly affected by DM policies.

3.5 SUMMARY OF INTERNATIONAL SITES NOT SCOPED-OUT

The initial scoping exercise identified nine sites that could not be scoped-out. The sites that were not scoped-out for the HRA on the basis that Component Units are potentially close enough to settlements with Site Allocations and thus could be impacted by the Development Management Policy Document were:

- Norfolk Valley Fens SAC
- The Broads SAC, The Broads Ramsar Site and the Broadland SPA;
- The River Wensum SAC;
- Breckland SPA and Breckland SAC;
- Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC

Following this initial scoping, each of these International Sites where potential impacts from the Development Management Policies were considered possible, were assessed in Section 4.

4. DESIGNATED FEATURES OF SITES NOT SCOPED-OUT

4.1 OVERVIEW OF SITES

Nine sites are not scoped-out for the HRA on the basis that Component Units are potentially close enough to settlements with Site Allocations and thus could be impacted by the Development Management Policy Document:

- The Broads SAC, The Broads Ramsar Site and the Broadland SPA;
- The River Wensum SAC;
- Norfolk Valley Fens SAC;
- Breckland SPA and Breckland SAC;
- Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC

4.2 THE BROADS SAC AND RAMSAR SITE, BROADLAND SPA

The Broads International Sites form an extensive network along river valleys in east Norfolk and north Suffolk. The Broads SAC is comprised of 27 component units and the SPA from 26 component units; as understood the Ramsar site is comprised of 28 component sites.

Collectively the designated features cover vegetation, individual plant species, birds and other animals including invertebrates:

- Aquatic vegetation. Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.; and natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation.
- Fen vegetation. Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; alkaline fens; *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); transition mires and quaking bogs;
- Woodland. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
- Plants. Fen orchid *Liparis loeselii* and other rare plants
- Animals. Otter, Desmoulin's whorl snail *Vertigo moulinsiana*, *Anisus vorticulus*, and other invertebrates
- Birds. Overwintering species (pink footed goose *Anser brachyrhynchus*, wigeon *Anas penelope*, shoveler *Anas clypeata*, gadwall *Anas strepera*, Bewick's swan *Cygnus columbianus*, whooper swan *Cygnus cygnus*, hen harrier *Circus cyaneus*, great bittern *Botaurus stellaris*, ruff *Philomachus pugnax*); overwintering assemblage; breeding birds (marsh harrier *Circus aeruginosus*).

Four Component Units of The Broads SAC, The Broads Ramsar site and The Broadland SPA are in South Norfolk. These are all sites of Scientific Interest (SSSI):

- Hardley Flood SSSI
- Poplar Farm Meadows, Langley SSSI
- Ducan's Marsh, Claxton SSSI
- Yare Broads & Marshes SSSI (southern section only in South Norfolk)

Hardley Flood SSSI
Hardley Flood is an area of 48 hectares of shallow lagoons and reedbeds that act as a spillway for the River Chet. Breaches in the river-bank allow tidal waters to move freely between the river and the marsh. Soft muds are exposed at low tide and these attract a range of wading birds in spring and autumn while the reedbeds support nesting wildfowl and other fenland birds, including nationally important breeding populations of Shoveler, Pochard and Gadwall.

The unit is considered by Natural England to be in 100% Favourable Condition (April 1st, 2013). The maintenance of appropriate water levels is considered the most important factor in ensuring the important features of the SSSI are retained in favourable condition. Access is limited to two public footpaths at the boundaries of the site. A long-distance trail, the Wherryman Way, runs adjacent to the river. The wetness of the area precludes further public use.

Poplar Farm Meadows, Langley SSSI
This site is a small spring-fed calcareous fen of 7.23 hectares situated on the edge of the flood-plain of the River Yare. The meadows are exceptionally diverse and several scarce and locally uncommon plants are present. Species-rich calcareous fens are virtually confined to East Anglia and this site is an unusual example with intergrading fen grassland communities. These rich communities are maintained by light summer grazing. The surrounding dykes contain clear spring-waters and support an interesting assemblage of water-plants.

The unit is considered by Natural England to be in 100% favourable condition (April 1st 2013). Grazing management is considered to be the most significant factor in ensuring the continued improvements in this site condition. The site is privately owned and there is no public access.

Ducan's Marsh, Claxton SSSI
Ducan's Marsh is situated in the valley of a small tributary of the River Yare and is one of the richest areas of unimproved, wet valley grassland now remaining in East Norfolk. Springs emerge from the valley-side and species-rich fen and fen grassland communities have developed in the seepage zones. The plant communities include several uncommon species and are maintained by a traditional management of light summer grazing.

The unit is considered by Natural England to be in 100% recovering condition. The grassland has been surveyed annually since 2009 and little change has been noted in the important M13 plant community since 1986. Grazing management is considered to be the most significant factor in ensuring the continued improvements in this site condition. The site is privately owned and there is no public access.

Yare Broads & Marshes SSSI
This is a composite site made up of two former separate SSSIs known as Surlingham & Rockland Broads, and Strumpshaw Fen & Buckenham Marshes, with additions. Substantial areas are managed as nature reserves by the RSPB and NNT. The Yare Broads and Marshes are a nationally important wetland site consisting of extensive areas of unreclaimed fen, carr woodland, open water and grazing marsh on shallow fenland peats. The site lies in the middle reaches of the River Yare and is one of the key Broadland sites with great botanical and ornithological interest. The species-rich fens, dykes and unimproved meadows hold an outstanding assemblage of plants including many rare species. An important community of breeding birds is found or the fens and includes most of the typical Broadland species. The only regular wintering flock of bean geese in England frequent the grazing marshes at Buckenham. A Broadland speciality, the swallowtail butterfly is also present in good numbers on the site.

Surlingham and Rockland Broads are the sections of the SSSI which are within the boundary of South Norfolk. Strumpshaw RSPB reserve and Buckenham Marshes are north of the River Yare (the district boundary) and access from South Norfolk to these sites is restricted to distant river crossings.

Overall, 69% of the SSSI is considered by Natural England to be in favourable condition, with 14.7% in favourable recovering and just 1.7% in unfavourable and declining condition.

In the section south of the river, access is limited to public rights of way and nature trails, mostly along the river bank and adjacent to Rockland Broad. In places there are boardwalks to allow access at wetter times and to protect sensitive vegetation. A long-distance trail, the Wherryman Way, runs adjacent to the site. Water skiing is permitted on the river at various points in the area.

4.3 RIVER WENSUM SAC

The River Wensum SAC is designated from the headwaters near Fakenham downstream to Norwich, with the designated boundary in most parts restricted to the channel and banks but including adjacent marsh and fen in some parts of the valley. The southern limit of the designation is Costessey Mill.

Collectively the designated features cover vegetation, individual plant species, birds and other animals including invertebrates:

- Vegetation, both aquatic and bankside. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; and water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.
- Animals. White-clawed (or Atlantic stream) crayfish *Austropotamobius pallipes*; Desmoulin`s whorl snail *Vertigo moulinsiana*; brook lamprey *Lampetra planeri*; and bullhead *Cottus gobio*.

Within South Norfolk there are six management units of the SSSI (units 38-43). Of these units, numbers 40-43 are considered by Natural England (March 1st 2013) to be in unfavourable recovering condition. These units are improving through restoration of the floodplain. Units 38-39 are considered to be in unfavourable, no change condition and the lack of improvement is due to their isolation from the river. The most significant impacts on the river quality relate to agricultural run-off whilst inappropriate grazing regimes are the most significant factors in hindering improvements in the floodplain.

In the relevant reaches of the river, the floodplain grasslands are private and access is limited to public rights of way which are largely on the fringes of the SSSI. There are no formal facilities for public use in the area within South Norfolk.

4.4 NORFOLK VALLEY FENS SAC

Norfolk Valley Fens is a European Site comprising of a number of SSSI component units of valley-head spring-fed fens. Such spring-fed flush fens are very rare in the lowlands. Most of the vegetation is of the small sedge fen type, mainly M13 *Schoenus nigricans – Juncus subnodulosus* mire, but there are transitions to reedswamp and other fen and wet grassland types. The individual fens vary in their structure according to intensity of management and provide a wide range of variation. There is a rich flora, including grass-of-Parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris*, marsh helleborine *Epipactis palustris* and narrow-leaved marsh-orchid *Dactylorhiza traunsteineri*. These are very ancient wetlands and several support strong populations of Desmoulin`s whorl snail *Vertigo moulinsiana* and Narrow-mouthed whorl snail *Vertigo angustior* as part of a rich assemblage of Red Data Book and Nationally Scarce species in standing water habitat.

These alkaline fens are generally small in area and surrounded by intensively-farmed land. They are very vulnerable to reductions on the water table and a decrease in the volume of spring flows arising from groundwater abstraction. In recent decades scrub and woodland has spread due to the cessation of traditional cutting and grazing management and the drying-out of the fens. These sites are now largely isolated from the rural economy of which they were once a

part, and in many instances this traditional management has become uneconomic. Two component units are in the South Norfolk district boundary, Flordon Common SSSI and Coston Fen, Runhall SSSI.

Flordon Common SSSI
Flordon Common is a 10 hectare site situated in the valley of the River Tas on shallow fenland peats. Springs emerge on the valley-side bearing base-rich waters from the underlying chalk and in these areas species-rich calcareous fen has developed. On higher ground unimproved pasture is present. The Common continues to be managed in a traditional manner by light summer grazing and this has ensured the survival of many locally uncommon plants. A strong population of Narrow-mouthed whorl snail *Vertigo angustior* occurs in flushed grassland.

Natural England condition assessment (April 2013) states 79.4% of the area is in unfavourable recovering condition with the remaining area in favourable condition. The maintenance of water levels and a correct grazing regime are considered the most important factors in ensuring the site meets its conservation objectives. The site is registered common land with unrestricted access and a public footpath skirts the southern boundary.

Coston Fen, Runhall SSSI
Coston Fen is a spring-line fen of 7.3 hectares situated on a slope of the Yare Valley along its upper reaches. There is movement of calcareous groundwater from a seepage zone along the top of the slope down to a collecting drain along the base, and this has resulted in the development of a wide diversity of open fen habitats, including a nationally rare calcareous mire community which is largely confined to East Anglia. The site supports a number of locally uncommon plants. Natural England condition assessment (April 2013) states 100% of the area is in unfavourable no change condition. The reason for this condition appears to be related to water abstraction, with investigations ongoing. The site is private and there are no public rights of way in the locality.

4.5 BRECKLAND SPA AND SAC

The Breckland of Norfolk and Suffolk lies in the heart of East Anglia on largely sandy soils of glacial origin. In the 19th century the area was termed a sandy waste, with small patches of arable cultivation that were soon abandoned. The continental climate, with low rainfall and free-draining soils, has led to the development of dry heath and grassland communities. Much of Breckland was planted with conifers through the 20th century, and elsewhere arable farming is the predominant land use. The remnants of dry heath and grassland that have survived these changes support heathland-breeding birds, where grazing by sheep and rabbits is sufficiently intensive to create short turf and open ground. These species have also adapted to live in forestry and arable habitats. Woodlark *Lullula arborea* and Nightjar *Caprimulgus europaeus* breed in recently

felled areas and open heath areas within the conifer plantations, while Stone Curlew *Burhinus oedicnemus* establishes nests on open ground provided by arable cultivation in the spring.

The designated features of the SPA are:

- Breckland Forest SSSI component units: breeding woodlark and nightjar, rare plants and invertebrates, geology
- Breckland Farmland SSSI component units: breeding stone curlew (population increasing)
- Breckland Heathland SSSIs (various sites): breeding stone curlew (population declining), nightjar and woodlark, grassland and heath habitats.

The designated features of the SAC are:

- Inland dunes, natural eutrophic lakes, dry heaths, alluvial forests and great crested newt.

There are 12 component SSSI in Breckland DC area, of which Bridgham & Brettenham Heaths SSSI is the nearest to South Norfolk. The SSSI is situated <10km to the north and east of Thetford is linked to East Wretham Heath SSSI and through this to the Stanford Training Area, thus forming the largest remaining block of Breckland heath. Cranberry Rough, Hockham SSSI is c10km from the South Norfolk boundary.

Bridgham & Brettenham Heaths SSSI
The site is 446 hectares of Breckland heather and grass heath. The soils are predominantly acid sands, heavily podsolised in places, but areas of surface chalk are present particularly to the east. Vegetation is mostly heather and acid grassland with considerable ares of bracken and some scrub. The site is part-owned by the Norfolk Wildlife Trust who manage access and close parts of the reserve when stone curlew are nesting. The Natural England condition assessment states 13.0% of the area is in favourable condition with 87.0% unfavourable, recovering. Threats are nutrient deposition, run-off, scrub invasion and inappropriate recreation.

East Wretham Heath SSSI
The SSSI is 141 hectares of Breckland meres and grassland with its principle scientific interest being the two fluctuating meres, Ringmere and Langmere, supplied by chalk ground water. Secondary woodland and scrub are present. The site is owned by the Norfolk Wildlife Trust who manage access. The Natural England condition assessment states 41.6% of the area is in favourable condition with 58.4% unfavourable, recovering. Threats are nutrient deposition, run-off, scrub invasion and inappropriate recreation.

Stanford Training Area SSSI
The SSSI covers 4681 hectares of extensive Breckland grassland and heath with mature woodland, carr woodland, streams and fluctuating meres. Stone curlew breed. The area is a live-firing zone and no public access is allowed. The Natural England condition assessment states 41.8% of the area is in favourable condition with 37.4% unfavourable, recovering and 20.8% no change. Threats are lack of management of bracken and scrub invasion, poor heather and grazing management.

Cranberry Rough, Hockham SSSI
This SSSI is a basin mire of 81.4 hectares with swamp woodland with a network of ditches and pools. The site has a generally high and stable water table and a lack of pollution means it contains an exceptionally wide range of wetland plants, butterflies and other insects. The site is owned by the Norfolk Wildlife Trust. The Natural England condition assessment states 21.6% of the area is in favourable condition with 78.4% unfavourable, recovering.

4.6 WAVENEY AND LITTLE OUSE VALLEY FENS/REDGRAVE & LOPHAM RAMSAR

Redgrave and Lopham Fens SSSI is a component unit of the Waveney and Little Ouse Valley Fens SAC and is a Ramsar site in its own right. It consists of an extensive area of spring-fed valley fen at the headwaters of the River Waveney. It supports several distinct fen vegetation types, ranging from *Molinia*-based grasslands, mixed sedge fen to reed-dominated fen. There are small areas of wet heath and carr woodland. The invertebrate fauna is extensive and is the only British locality for the fen raft spider *Dolomedes plantarius*. Desmoulins's whorl snail *Vertigo moulinsiana* is present. The site has been restored in an internationally recognised restoration project, costing approximately £3.4 million.

The site is owned and managed by the Suffolk Wildlife Trust. The reserve is open to the public all year round. It has an Education Centre which it uses to host family activity days, school trips and adult education courses. There is a picnic area, toilet facilities and there are three dedicated nature trails. The Natural England condition assessment states that 100.0% of the area is in unfavourable, recovering condition.

5 STAGE 1: TESTS OF LIKELY SIGNIFICANT EFFECTS

5.1 OVERVIEW

Each Policy in the South Norfolk Policies Document is assessed to address if it may adversely impact any component unit of the International Sites that have not been scoped-out in the initial scoping exercise. This determines if an Appropriate Assessment will be required. The information is summarised in Table 2.

Table 2: Assessment of likelihood of potential impacts on International Sites with component units in or near South Norfolk District Boundary from South Norfolk Council Development Management Policies

Policy	Likely Significant Effect?	International Site(s) Affected	Possible Mechanism by which Policy may impact International Sites	Possible Feature(s) Impacted	Appropriate Assessment Required?
Strategic Policies					
DM 1.1 Ensuring development management contributes to achieving sustainable development in South Norfolk	Possible	Norfolk Valley Fens; The Broads International Sites; Breckland SPA & SAC; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Potential impact through recreational disturbance as a result of disturbance from new residents. However, this Policy ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area. This strategic policy is supported by DM 2.9 and DM 3.16 with regards to protecting the environment from recreation pressure and countryside tourism. Extra demand on water resources may reduce groundwater supplies and have negative effects on water levels. However Water Cycle Study for GNDP provides assurance of no issues with water abstraction and disposal. SNC Site Allocation Document has been subjected to a HRA which concluded an Appropriate Assessment was not necessary with regards to potential impacts from specific location of growth.	Bird assemblages, vegetation features	No

DM 1.2 Requirement for infrastructure through planning obligations	Possible	Norfolk Valley Fens; The Broads International Sites; Breckland SPA & SAC; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Potential impact through recreational disturbance from new residents. In combination with Policy DM 3.16, this Policy ensures delivery of Open Space within development thus discouraging use of International Sites for basic low-level recreation. Extra demand on water resources may reduce groundwater supplies and have negative effects on water levels. However Water Cycle Study for GNDP provides assurance of no issues with water abstraction and disposal. Site Allocation Document has been subjected to a HRA which concluded an Appropriate Assessment was not necessary	Bird assemblages, vegetation features	No
DM 1.3 Sustainable location of development	Possible	Norfolk Valley Fens; The Broads International Sites; Breckland SPA & SAC; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Policy ensures development will be on Allocated Sites or within development boundaries. Site Allocation Document has been subjected to a HRA which concluded an Appropriate Assessment was not necessary. Extra demand on water resources may reduce groundwater supplies and have negative effects on water levels. However Water Cycle Study for GNDP provides assurance of no issues with water abstraction and disposal and this was accepted in the HRA work of the Site Allocation Document	Bird assemblages, vegetation features	No
DM 1.4 Environmental Quality and local distinctiveness	Possible	Norfolk Valley Fens; The Broads International Sites; Breckland SPA & SAC; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Policy ensures environmental assets are protected and improved as a result of development including water resources, ecological networks and green infrastructure. Extra demand on water resources may reduce groundwater supplies and have negative effects on water levels. However Water Cycle Study for GNDP provides assurance of no issues with water abstraction and disposal.	Bird assemblages, vegetation features	No

Economic Dimension					
DM 2.1 Employment and business development	No	None	Impact possible if new development is located in or very near to International Sites. However Policy specifically only supports development for creation of new employment opportunities if there is no significant adverse impact in terms of Policies DM 1.1 and DM 1.3	None	No
DM 2.2 Protection of employment sites	No	None	No impact	None	No
DM 2.3 Working from home	No	None	No impact	None	No
DM 2.4 Location of main town centre uses	No	None	Not sufficiently near to International Sites to be significant.	None	No
DM 2.5 Changes of use in town centres and local centres	No	None	Not sufficiently near to International Sites to be significant.	None	No
DM 2.6 Food, drink and hot food takeaways	No	None	No impact	No	None
DM 2.7 Agricultural and forestry development	No	None	Impact possible if development is located in or very near to International Sites. Policy ensures adverse impacts on the natural and local environment are avoided.	No	None
DM 2.8 Equestrian and other small rural land based activities	No	None	Impact possible if new development is located in or very near to International Sites. However Policy ensures adverse impacts on the natural and local environment are avoided.	No	None
DM 2.9 Rural tourist and recreational destinations	Possible	Norfolk Valley Fens; The Broads International Sites; Breckland SPA & SAC; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Potential impact through recreational disturbance as a result of disturbance from new recreational or tourist ventures. However Policy ensures adverse impacts on the natural and local environment are avoided and Policy DM 1.1 ensures development should jointly & simultaneously improves economic, social and environmental conditions of the area.	No	None

DM 2.10 Conversion and re-use of buildings in the Countryside for non-agricultural use	No	None	Impact possible if new development is located in or very near to International Sites. However Policy DM 1.1 ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 2.11 Agricultural and other occupational dwellings in the Countryside	No	None	Impact possible if new development is located in or very near to International Sites. However Policy DM 1.1 ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 2.12 Tourist accommodation	No	None	Impact possible if new development is located in or very near to International Sites. However Policy specifically protects the nature conservation value of an area. Policy DM 1.1 ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area. This is specifically supported by Policy DM 2.9 which ensures rural tourism avoids adverse impacts on the natural and local environment.	No	None
Social Dimension					
DM 3.1 Housing Quality	No	None	This policy is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area thus protecting International Sites from adverse impacts. South Norfolk Place Making Guide SPD specifically refers to need to protect natural assets	No	None
DM 3.2 Meeting housing requirements and needs	No	None	Impact possible if new development is located in or very near to International Sites; this policy is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area thus protecting International Sites from adverse impacts.	No	None
DM 3.3 Meeting rural housing needs	No	None	Impact possible if new development is located in or very near to International Sites. However Policy DM 1.1 ensures development should jointly and	No	None

			simultaneously improves the economic, social and environmental conditions of the area.		
DM 3.4 Gypsy and Traveller sites	No	None	Policy specifically states that development will not be allowed on or near an International or National environmental asset. This is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 3.5 Residential extensions and conversions within Settlements	No	None	No impact	No	None
DM 3.6 Replacement dwellings and additional dwellings on sub-divided plots within Settlements	No	None	No impact	No	None
DM 3.7 House extensions and replacement dwellings in the Countryside	No	None	No impact	No	None
DM 3.8 Residential annexes	No	None	No impact	No	None
DM 3.9 Design Principles	No	None	No impact	No	None
DM 3.10 Advertisements and signs	No	None	No impact	No	None
DM 3.11 Promotion of sustainable transport	No	None	No impact	No	None
DM 3.12 Road safety and the free flow of traffic	No	None	No impact	No	None
DM 3.13 Provision of vehicle parking	No	None	No impact	No	None

DM 3.14 Amenity, noise and quality of life	No	None	No impact	No	None
DM 3.15 Pollution, health and safety	Possible	Norfolk Valley Fens; The Broads International Sites; The River Wensum SAC; Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC	Impact possible if new development is located in or very near to International Sites; potential run-off could lead to reduction in water quality at International Sites thereby impacting on their designated features. Policy ensures all development should minimise adverse impacts of all forms of emissions and ensure that there is no deterioration in water quality or water courses. This is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 3.16 Outdoor play facilities and recreational space	No	None	New housing development will be required to provide for outdoor recreational space in line with the council's adopted standards. This is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 3.17 Improving the community facilities	No	None	No impact	No	None
Environmental Dimension					
DM 4.1 Building Fabric Energy Efficiency, Carbon Compliance and Allowable Solutions	No	None	No impact	No	None
DM 4.2 Renewable Energy	Possible	The Broads International Sites	Impact possible if new development is located in or very near to International Sites; potential impact on species that are designated features in International Sites e.g. Wind turbines have the potential to cumulatively impact protected bird species through avoidance and collision. However Policy ensures that renewable developments will not be permitted where individually or cumulatively there may be significant adverse	Summer or winter bird assemblages,	None

			impacts on nature conservation assets. This is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.		
DM 4.3 Sustainable drainage and water management	Possible	Norfolk Valley Fens; The Broads International Sites; The River Wensum SAC	Impact possible if new development is located in or very near to International Sites; surface water may adversely impact designated features of International Sites due to impacts from nutrient enrichment. Policy requires all developments should have a sewerage capacity assessment. Sustainable drainage measures must be fully integrated into all developments. Furthermore the water cycle study indicates there is sufficient capacity in the sewerage treatment system to accommodate new housing proposals without any reduction in output quality.	Vegetation communities	None
DM 4.4 Facilities for the collection of recycling and waste	No	None	No impact	No	None
DM 4.5 Natural environmental assets – designated and locally important open spaces	No	None	The highest status natural environmental assets are identified on the Proposals Map and in supporting evidence, and will be protected from any significant harmful impact arising from new development. This is supported by Policy DM 1.1 which ensures development should jointly and simultaneously improves the economic, social and environmental conditions of the area.	No	None
DM 4.6 Landscape Character Areas and River Valleys	No	None	The highest status natural environmental assets are identified on the Proposals Map and will be protected from any significant harmful impact arising from new development. This policy places a particular regard to protecting the landscape character of river valleys.	No	None

DM 4.7 Landscape Setting of Norwich	No	None	No impact	No	None
DM 4.8 Strategic gaps between settlements within the Norwich Policy Area	No	None	No impact	No	None
DM 4.9 Protection of Trees and Hedgerows	No	None	No impact	No	None
DM 4.10 Incorporating landscape into design	No	None	No impact	No	None
DM 4.11 Heritage Assets	No	None	No impact	No	None

5.3 SUMMARY OF STAGE 1: TESTS OF LIKELY SIGNIFICANT EFFECTS

As discussed earlier, in comparison to the rest of the county, the district of South Norfolk has very few international sites, and none are entirely within the district boundary. These are a small number of component units of The Broads/Broadland International Sites, two small component units of the Norfolk Valley Fens and a small section of the River Wensum SAC. However, there is the potential for the South Norfolk Development Management Policies to impact a wider range of International Sites, and the following were subjected to Tests of likely significance:

- Norfolk Valley Fens
- The Broads SAC, The Broads Ramsar Site and the Broadland SPA;
- Breckland SPA and Breckland SAC;
- The River Wensum SAC;
- Redgrave & South Lopham Fens Ramsar/ Waveney and Little Ouse Valley Fens SAC

Having completed the Stage 1 test, it is considered that there is sufficient confidence for significant effects to be considered unlikely as a result of the South Norfolk Development Management Policies. Therefore an Appropriate Assessment is not required for disturbance effects on any of the International Sites.

As it is concluded that significant effects are unlikely there is no need to undertake further stages of the HRA process.

6. CONCLUDING REMARKS

As it is considered that there is sufficient confidence for significant effects to be considered unlikely and an Appropriate Assessment is not required there is no need to undertake further stages of the HRA process.

The HRA work for the Greater Norwich JCS (Mott Macdonald, 2010) highlighted the need for the implementation of green infrastructure developments to offset the possibility of uncertainty regarding potential in combination and cumulative effects associated with water resources and tourism (recreation) on International Sites. Although this process has demonstrated that there is sufficient confidence for significant effects from the Development Management Policies, together with the Site Allocations Document and Wymondham AAP, on International Sites to be considered unlikely, it is reasonable to take a precautionary approach. As such it is recommended that green/recreation space requirements for new developments are strongly supported and given significant weight when determining planning applications.

7. REFERENCES

Anglian Water, Environment Agency & Natural England (2012). Joint Core Strategy for Broadland, Norwich and South Norfolk – Habitats Regulations Assessment Supplementary Note. Cover letter to an amended version of Mott Macdonald (2010).

Broads Authority (2006) Appropriate Assessment of the Core Strategy – Submission Report. Under the Conservation (Natural Habitats, &C) (Amendment) (England and Wales) Regulations 2006. September 2006. Available from: http://www.broadsauthority.gov.uk/authority/consultations/core-strategy/submission-core-strategy-dpdconsultation.Html

Broads Authority (2010) Broads Boat Census. Broads Authority, Norwich.

Broads Authority (2011) A Strategy and Action Plan for Sustainable Tourism in the Broads 2011 – 2015. Broads Authority, Norwich.

DfCLG (2012) National Planning Policy Framework. Department for Communities and Local Government, London.

Dolman, P., Lake, I. R. & Bertoncelj, I. (2008) Visitor Flow Rate and Recreational Modelling in Breckland. UEA, Norwich.

Ecology Consultancy (2013) Information to inform a Habitats Regulation Assessment: North Sprowston & Old Catton. Report for Beyond Green

English Nature (2004) European Sites Guidance. English Nature, Peterborough. European Commission (2007) Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Available from: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

Footprint Ecology & David Tyldesley & Associates (2012), Habitats Regulations Assessment of Great Yarmouth Local Plan Core Strategy, November 2012, Report for Great Yarmouth Borough Council

Gill, J.A., Norris, K. & Sutherland, W.J. (2001a) Why behavioural responses may not reflect the population consequences of human disturbance. Biological Conservation 97, 265-268.

Goss-Custard, J.D. (2008) National Cycle Network – Exe Estuary Cycleway. Update of the Appropriate Assessment of the subsections from Turf Lock to Powderham Church. Report to Devon County Council. Available from: www.devon.gov.uk/plandoc_91_3396.pdf

Grant, G. (2010) Habitats Regulations Assessment of the Great Yarmouth Waterfront Area Action Plan. Further Preferred Options; October 2010. Available from: www.greatyarmouth. gov.uk/view/GYBC110690

Great Yarmouth BC (2005) Core Strategy Development Plan Document 2021. Issues and Options. Great Yarmouth Borough Council, Great Yarmouth.

Great Yarmouth BC (2009) Great Yarmouth Profile. Available from: http://www.enterprisegy.co.uk/downloads/1/great_yarmouth_profile_2009%5B1%5D.pdf

Hill, D., Hockin, D., Price, D. Tucker, G. Morris, R. & Treweek, J. (1997). Bird disturbance: improving the quality and utility of disturbance research. Journal of Applied Ecology 34, 275-288.

Jones, A., Bateman, I. & Wright, J. (2003) Estimating Arrival Numbers and Values for Informal Recreational Use of British Woodlands. CSERGE / FC, Norwich.

Kirby, J., Davidson, N., Giles, N., Owen, M. & Spray, C. (2004). Waterbirds and Wetland Recreation Handbook: A review of Issues and Management Practice. The Wildfowl & Wetlands Trust. Slimbridge.

Liley, D (2008a*).* Development and the North Norfolk coast. Scoping Document on the Issues Relating to Access. Footprint Ecology, Dorset.

Liley, D. (2008b) Little Terns at Great Yarmouth. Disturbance to birds and implications for strategic planning and development control. Unpublished report commissioned by Great Yarmouth Borough Council and the RSPB. Footprint Ecology, Wareham, Dorset.

Liley, D., Hoskin, R., Lake, S. & Underhill-Day, J. (2009) Habitats Regulations Assessment of the Great Yarmouth Core Strategy.

Liley, D., Hoskin, R., Underhill-Day, J. & Tyldesley, D. (2008) Habitat Regulations Assessment: Breckland Council Submission Core Strategy and Development Control Policies. Breckland District Council, Dereham.

Liley, D., Jackson, D.B. & Underhill-Day, J.C. (2006) Visitor Access Patterns on the Thames Basin Heaths. English Nature, Peterborough.

Mott Macdonald (2010) Habitats Regulation Assessment. Joint Core Strategy for Broadland, Norwich and South Norfolk. Greater Norwich Development Partnership, Norwich.

Scott Wilson (2010) Greater Norwich Development Partnership. Stage 2b Water Cycle Study. Greater Norwich Development Partnership, Norwich.

Sutherland, W.J., Armstrong-Brown, S., Armsworth, P.R., Brereton, T., Brickland, J., Campbell, C.D., Daniel E. Chamberlain, D.E., Cooke, A.L., Nicholas K. Dulvy, N.K., Dusic, N.R., Fitton, M., Freckleton, R.P.,Godfray, C., Grout, N., Harvey, H.J., Hedley, C., Hopkins, J.J., Kift, N.B., Kirby, J., Kunin, W.E., MacDonald, D.W., Marker, B., Naura, M., Neale, A.R., Oliver, T., Osborn, D., Pullin, A.S., Shardlow, M.E.A., Showler, D.A., Smith, P.L., Richard J. Smithers, R.J., jean-Luc Solandt, J.-L., Spencer, J., Spray, C.J., Thomas, C.D., Thompson, J., Webb, S.E., Yalden, D.W. & Watkinson, A.R. (2006) The identification of 100 ecological questions of high policy relevance in the UK. Journal of Applied Ecology 43, 617–627.

Tyldesley, D. (2011) Assessing projects under the Habitats Directive: Guidance for Competent Authorities. Report to the Countryside Council for Wales, Bangor
Wildfrontier (2011) Broads Authority Development Management Policies DPD. Appropriate Assessment (schedule of Proposed Minor Changes) – March 2011. Available at: http://www.broads-authority.gov.uk/broads/live/search.html

Wildfrontier (2012) Broads Authority Draft Habitats Regulations Assessment of Site Specific Policies. Broads Authority, Norwich.